

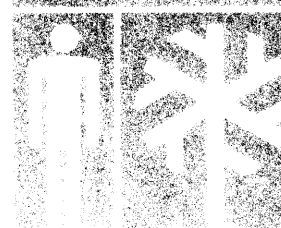
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assessment of alternatives
for development concept plan

march 1979

HUBBELL TRADING POST

NATIONAL HISTORIC SITE / ARIZONA



ASSESSMENT OF ALTERNATIVES
for the
DEVELOPMENT CONCEPT PLAN

HUBBELL TRADING POST NATIONAL HISTORIC SITE
ARIZONA

Denver Service Center
National Park Service
U.S. Department of the Interior

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This is an assessment of alternative proposals for development at Hubbell Trading Post National Historic Site in Arizona. At this time, the National Park Service (NPS) is not proposing a single set of development actions. Rather, this document contains four alternative development strategies, or packages, for consideration by the public, and subsequent selection of the best option by NPS managers.

A summary of development alternatives and a summary of impacts are shown in the following two pages. In the Alternatives Summary matrix the rows relate to development issues addressed in this planning effort and the columns identify alternative development packages, ranging from greater levels of new development (#1) to the status quo (#4). Further details and graphics are contained in the Alternatives and Assessment sections of this report.

HUBBELL TRADING POST DEVELOPMENT ALTERNATIVES SUMMARY

DEVELOPMENT ISSUES	1	2	3	4 (status quo)
Visitor Center	New Building in development zone	School building (enlarged)	School building	Contact at counter in store
Administrative Space	In new visitor center	In school building (HB-12 enlarged)	School building and HB-15	Wareroom extn. (HB-9) and Hubbell home (HB-2)
Parking	New area in development zone Trade and some visitor parking at post	New area in school tract RV/bus parking in existing trade at post	—————→	Existing informal
Picnic Area	New luncheon area in development zone	New area in school tract	—————→	None
Roads	Surface existing road to existing cinder lot; service road; replace bridge	—————→ Except rehab. bridge	Surface existing road to visitor parking area; Rehab. bridge	Existing dirt
Walks/Trails	Surfaced walkway from v.c. to trading post and surfaced trail	Surfaced trail down lane, unsurfaced around historic complex	Unsurfaced trail down lane	None
Public Restrooms	In new visitor center and wareroom extn. (HB-9)	In HB-13	—————→	Existing
Program Facility	Education/training, meetings, crafts and public restrooms in various extn. (HB-9)	In managers residence (HB-4)	—————→	None
Collections Storage/Lab	Hubbell material on-site in school building Prehistoric material off-site	In wareroom extension (HB-9)	HB-9 including curator office —————→	Stored in wareroom extn. (HB-9), bunkhouse (HB-5)
Housing	New units in development zone	—————→	Lease housing off-site	Existing house trailers
Maintenance	New building and area in development zone	—————→	Locate in barn (HB-3) or service station	Existing (in wareroom)
Energy	Solar heating and cooling and wind electric generation Back-up conventional	—————→ Develop zone only	Wind only	Existing conventional
Solid Waste Disposal	Incinerator in maintenance area (development zone)	Actively seek bringing Ganado landfill into compliance; and use	Compactor in barn - haul to approved landfill (Gallup)	Haul to existing landfill (in violation of EPA guidelines)
Security Center	Control panel and enunciator in development zone	—————→	Watchman in HB-15	Control panel in HB-4 Enunciator HB-1
Fencing	Fence boundaries	—————→	—————→	Existing
Farm Development	Restore/maintain irrigation system on historic lands	—————→	—————→	Existing (fallow)
Landscape Treatment	Intensively landscape development zone Selective restoration in historic zone	—————→	Replacement in kind	Maintain existing

SUMMARY OF IMPACTS

	1	2	3	4
Concept	New development	Mixed use	Maximum adaptive use	Status quo
Rationale	Provides greatest potential for appropriate use and design of buildings	Uses existing structures and promotes new facilities where appropriate	Takes greatest advantage of existing structures	
Impacts				No significant impact
Archeological Resources	Direct: proximity and construction	Indirect proximity		
Historical Resources	Visual; minimal interior impacts; additional use	Some interior impact; more use; "wear and tear"	Direct interior effect; some exterior; greater "wear and tear"	
Natural Resources	Construction - short term impacts; long term minimal		Insignificant	
Visitor Use	Maximum potential increased capacity, annual visitation; length of stay, variety, amenities, and information service	Moderate	Some	Continued limitation
Interpretation	Interpretation of abstract, subject and site themes; maximum media variety		Primarily subject and site themes; moderate media variety	Continued primarily site themes only; minimum media variety
Park Management	Demand for increased staff 4 full time equiv.; improved working conditions	Improved working conditions; increased staff-3 full-time equiv.	Increased staff-3 full-time equiv.	Continued inadequate working conditions
Cost: Development*	\$2,247,300	\$1,625,100	\$593,200	\$220,400
Annual Operation	\$ 344,700	\$ 313,200	\$335,500	
Cost Per Visit**				
Development	\$ 4.93	\$ 3.59	\$ 1.34	\$ 4.68
Operations	\$ 7.34	\$ 6.66	\$ 7.12	\$ 4.68
Total	\$12.27	\$10.25	\$ 8.46	
Mitigation/Requirements	Cultural resources: compliance; approp. design, materials, monitoring			
	Natural: contract specs. requirements			

*1978 - construction costs only; add 46% for total costs (does not include inflation)

**Calculated using the number of recreation visits projected for 1985 (47,000) and amortizing development over 30 years at 8% interest (Source: WASO Budget Division)

ESTIMATED DEVELOPMENT COSTS*

HUBBELL TRADING POST

ASSESSMENT OF ALTERNATIVES

DEVELOPMENT	1	2	3
Visitor Center	New 1500 sf \$ 207,300	School Building-1200 sf \$ 39,000	School Building-1200 sf \$39,000
Administrative Space	New 1500 sf 207,300	School Building-1000 sf and addition 500 sf 73,000	School Building-1000 sf and HB-15 500 sf 48,000
Parking	New visitor 20 car 24,000 3 RV/bus 9,000 Staff 5 car 6,000 Trading Post 16,000	New visitor 20 car 24,000 Trading Post 16,000	New visitor 20 car 24,000
Picnic Area	New 6 table 3,600		
Roads	Surface entrance 16,100 New service 21,000 Replace bridge 115,000	Surface entrance 16,100 New service 21,000 Rehab. bridge 60,000	Surface entrance 8,300 Rehab. bridge 60,000
Walks	Along road 1200 ft. 2,400 other walks 800 Pedestrian bridge 32,000 Trail down lane 1,000	Walks 800 Trail down lane 1,000	
Public Restrooms	In visitor center and HB-9	Remodel stone building (HB-13) 18,100	
Program Facility	Remodel HB-9 2040 sf. 61,200	Remodel HB-4 22,000	
Collections Storage/Lab	Remodel school Building 2700 sf. 72,000	Remodel HB-9 61,200	
Housing	12 Family units 461,000 4 Apartments 131,000		
Maintenance Facility	New building 2000 sf. 108,800		Remodel portion of barn 1600 sf. or service station 22,200
Alternate Energy	Solar Visitor Center 40,000 Heating Maintenance Bldg 30,000 Housing 280,000 Other Historic 90,000 Wind Power 20,000	Solar Maintenance Housing 30,000 280,000 Wind Power 20,000	Wind Power 20,000 Compactor 30,000
Solid Waste Disposal	Incinerator 31,300		
Security System	Burglar/Fire 60,000		
Fencing	Boundary 20,000 ft b.w. 60,000 Maintenance area 7,000		Boundary 60,000
Farm Irrigation System	Checkgate Restoration and Ditch Maintenance 24,000		
Building Preservation/Restoration	Bunkhouse (HB-5) 23,000 Oven (HB-7) 15,000 Corrals and Sheds (HB-10) 30,000		
Remove Buildings	1,500		15,000
Upgrade Guest Hogan (HB-6)	Remodel kitchen and bath 7,000		
Remodel HB-4 Managers Residence	22,000	See above	See above
Restore Landscape Plants	Approx. 5 acres historic area 10,000		
Signing	1,000		
TOTALS	\$2,247,300	\$1,625,100	\$593,200

*1978 construction costs only; for design, supervision, and contingencies add 46%.

Alternative 4 "status quo" implies no development and therefore no development costs.

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N A T U R A L R E S O U R C E S

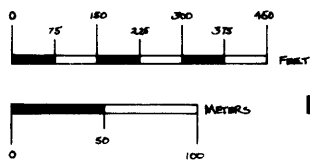
Topography

At an elevation of 1930 m (6,332 feet) above sea level, Hubbell Trading Post lies in a shallow valley adjacent to the Pueblo Colorado Wash. Low level sandstone buttes and mesas surround the site, which sits primarily on an upland terrace occasionally cut by minor washes tributary to the Pueblo Colorado. As shown on the topography map, the terrace is relatively level, making it conducive to irrigated agriculture.

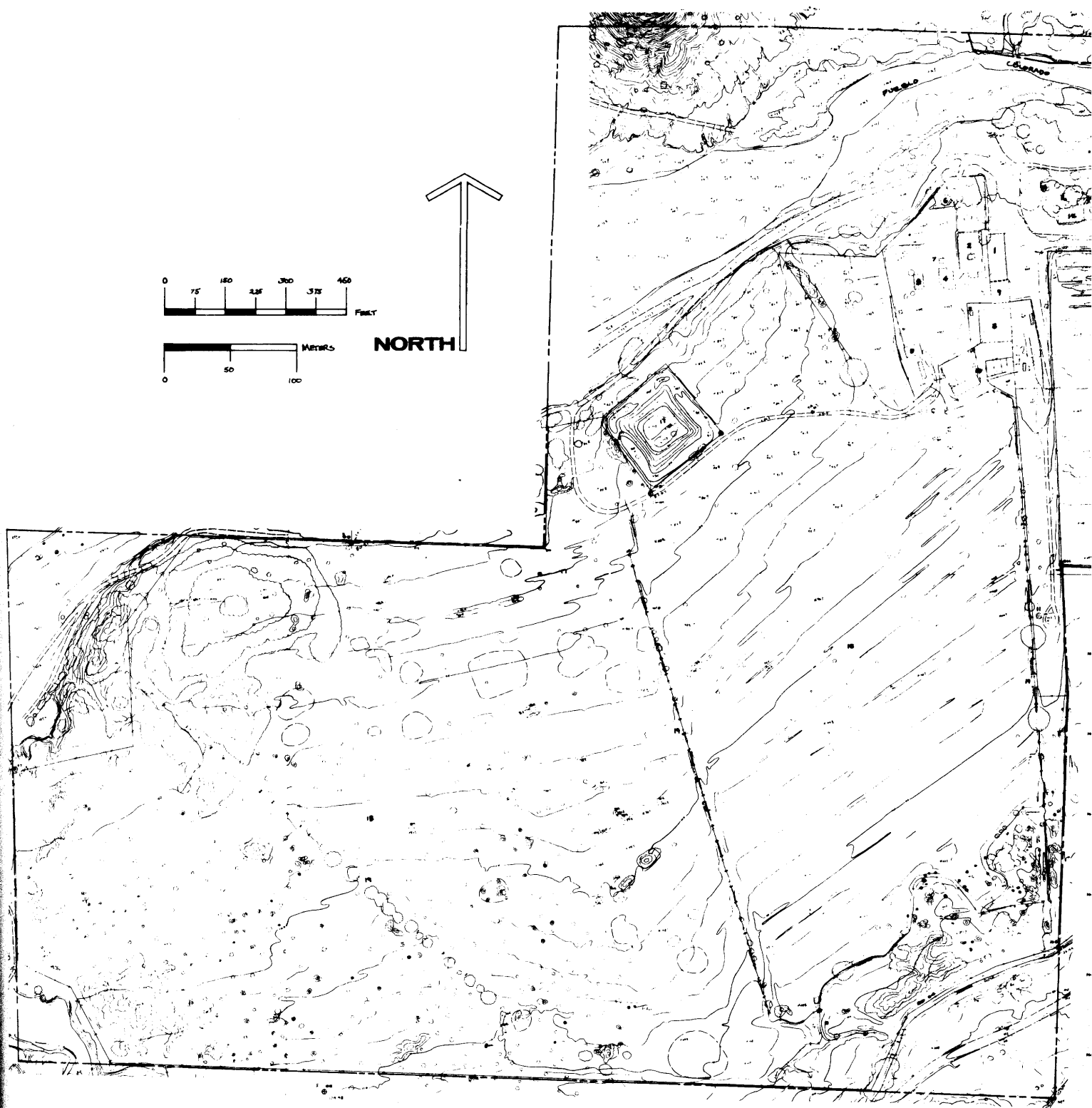
Soils

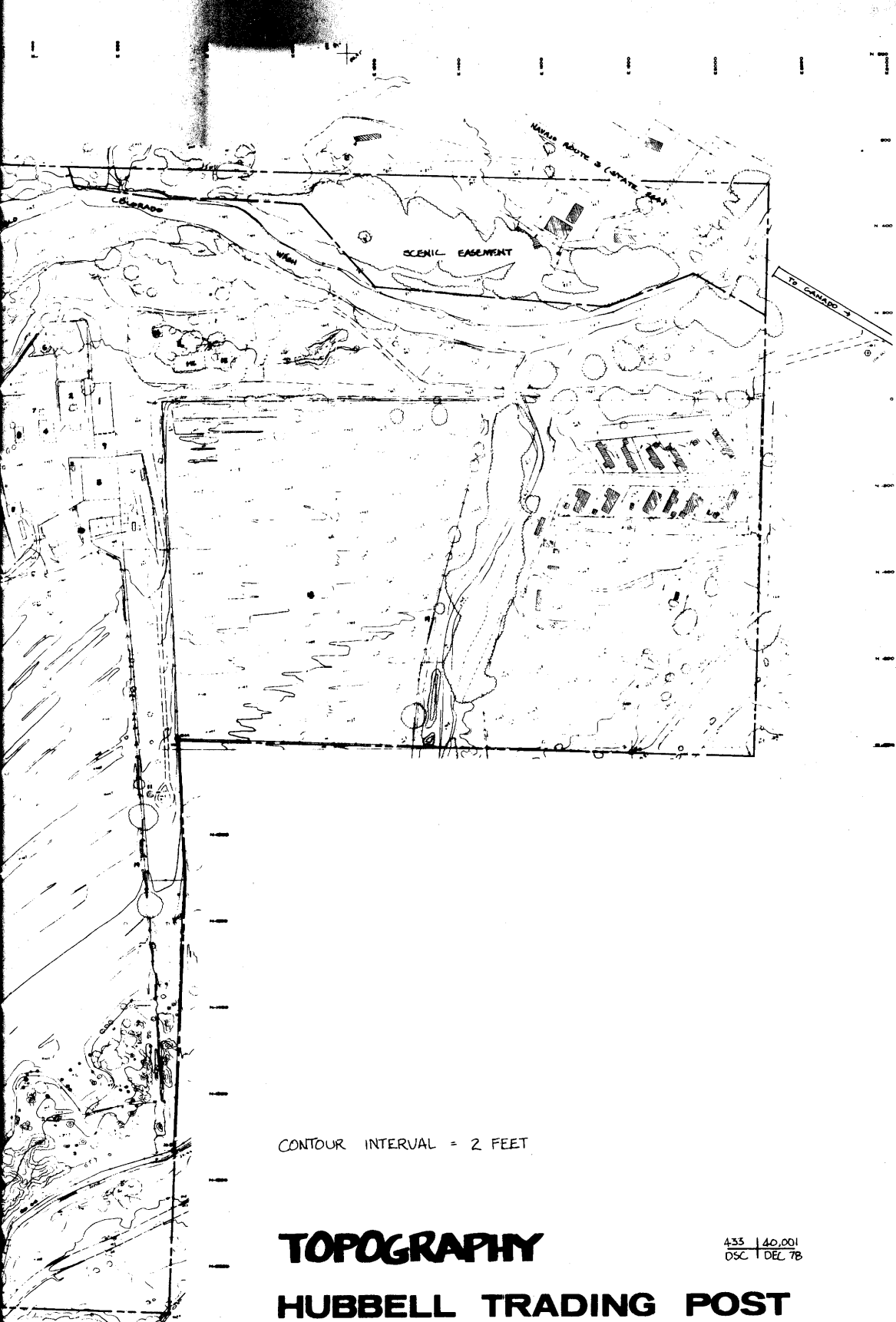
The soils of Hubbell Trading Post National Historic Site include clays, sandy clay loam and sandy loam. Most are deep, well-drained soils; the parent material is primarily alluvium. As shown on the Soils map, the largest soil unit is a clay loam, well-drained soil formed from old stream alluvium (Earth Environmental Consultants (EEC, 1978). The soil has moderate permeability and runoff is slow.

Much of the site was cultivated by the Hubbell family with the aid of a ditch-fed irrigation system. According to a soil survey recently completed for the park, most of the soils that were



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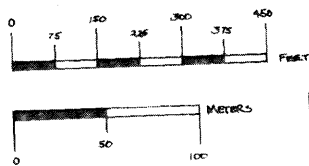


TOPOGRAPHY

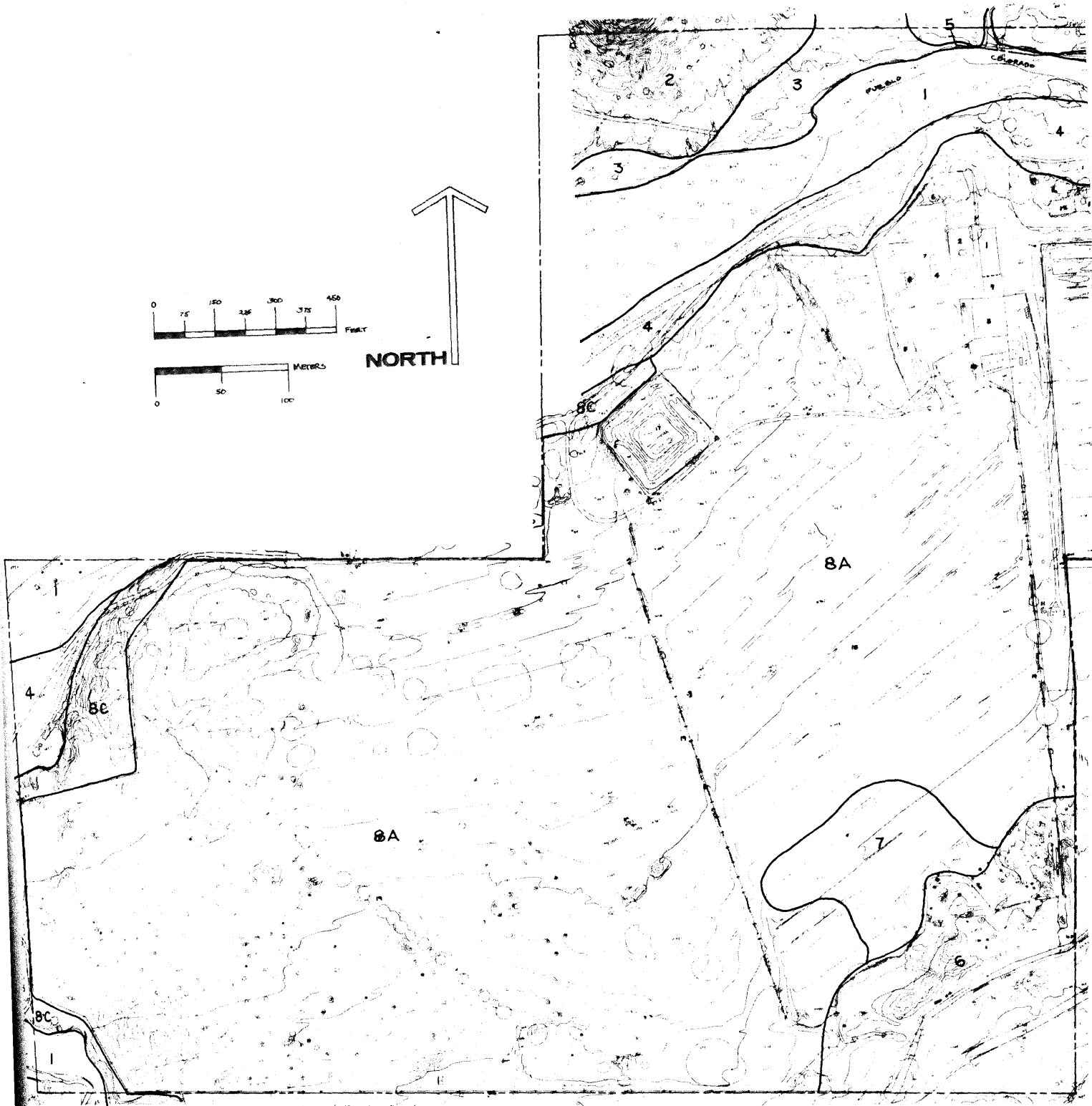
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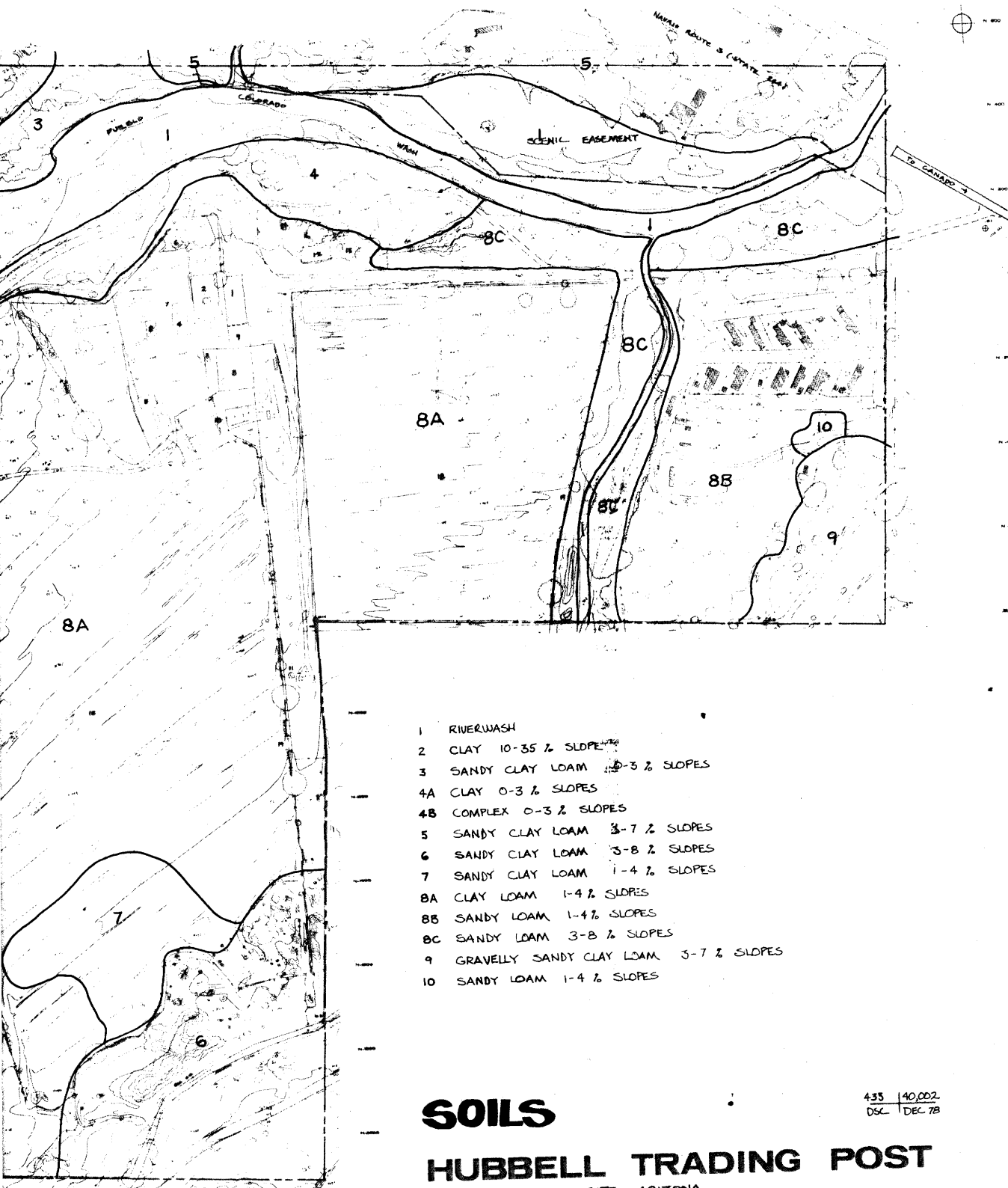
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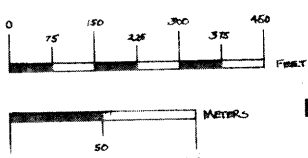


SOILS

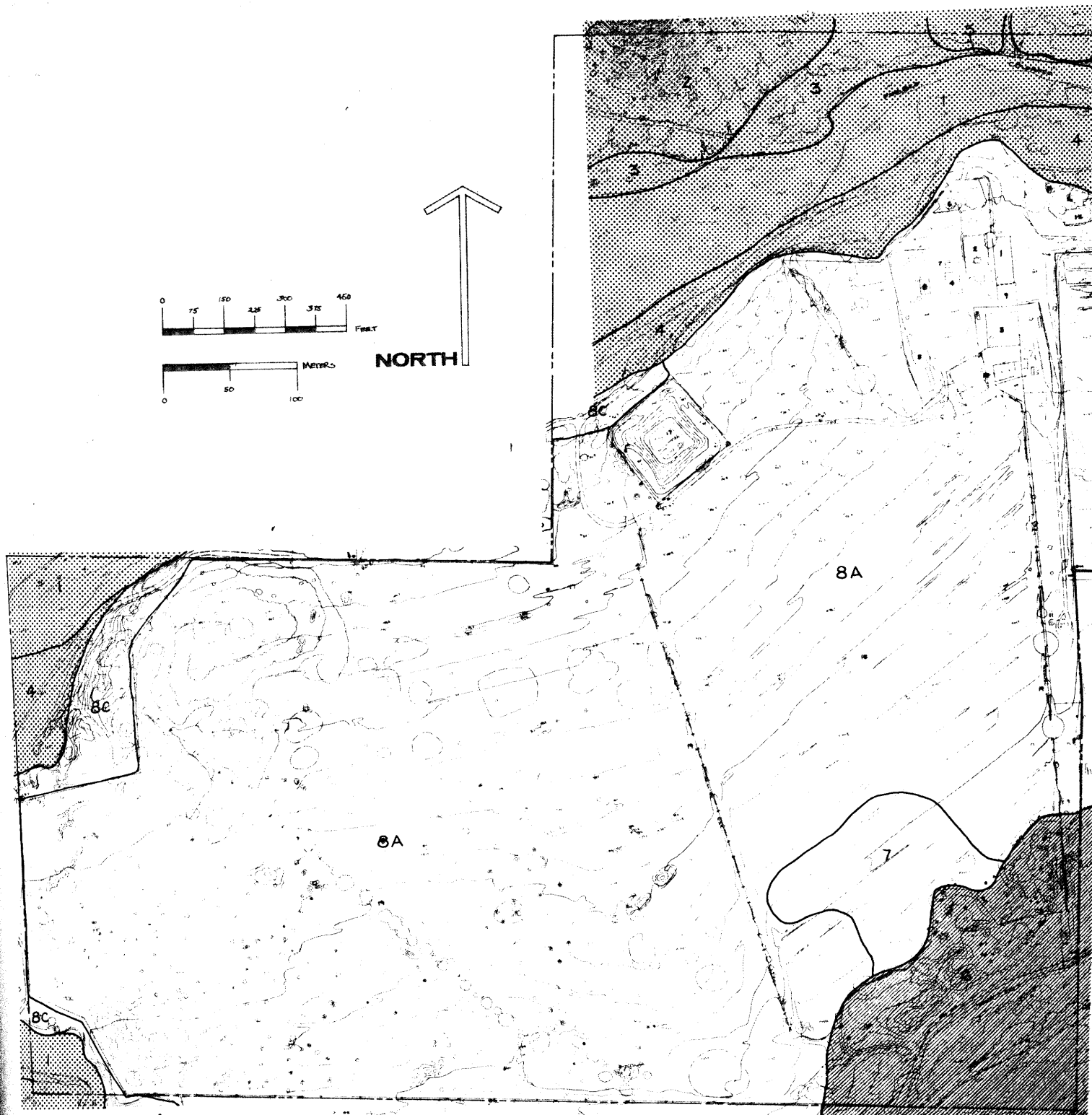
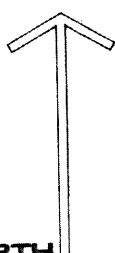
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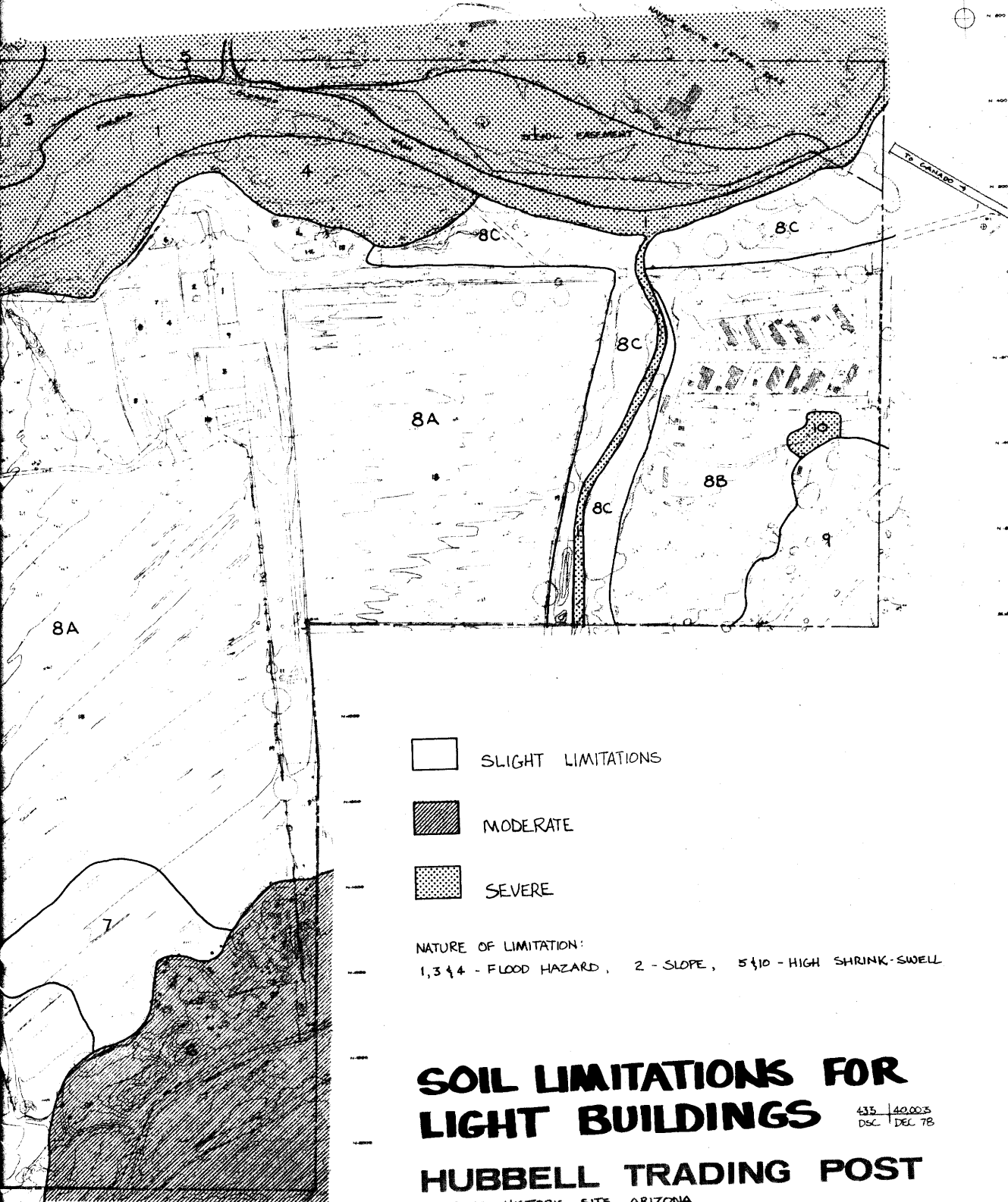
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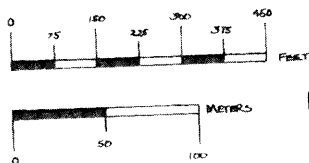


cultivated are well suited for irrigated agriculture, while most soils outside the area of past cultivation are not (EEC, 1978). According to the survey report, most soils that were used for cropland would classify as Class I or Class II farmland when irrigated (EEC, 1978). According to the Arizona State Conservationist (Soil Conservation Service), all areas shown on the soils map as units 8A and 8B that are irrigated qualify as prime farmland.

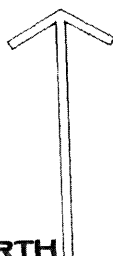
As shown on the Soil Limitation map, most soils at the park have only a "slight" limitation for dwellings and other light buildings (EEC, 1978). However, some are subject to flooding, others are subject to high shrink-swell factors.

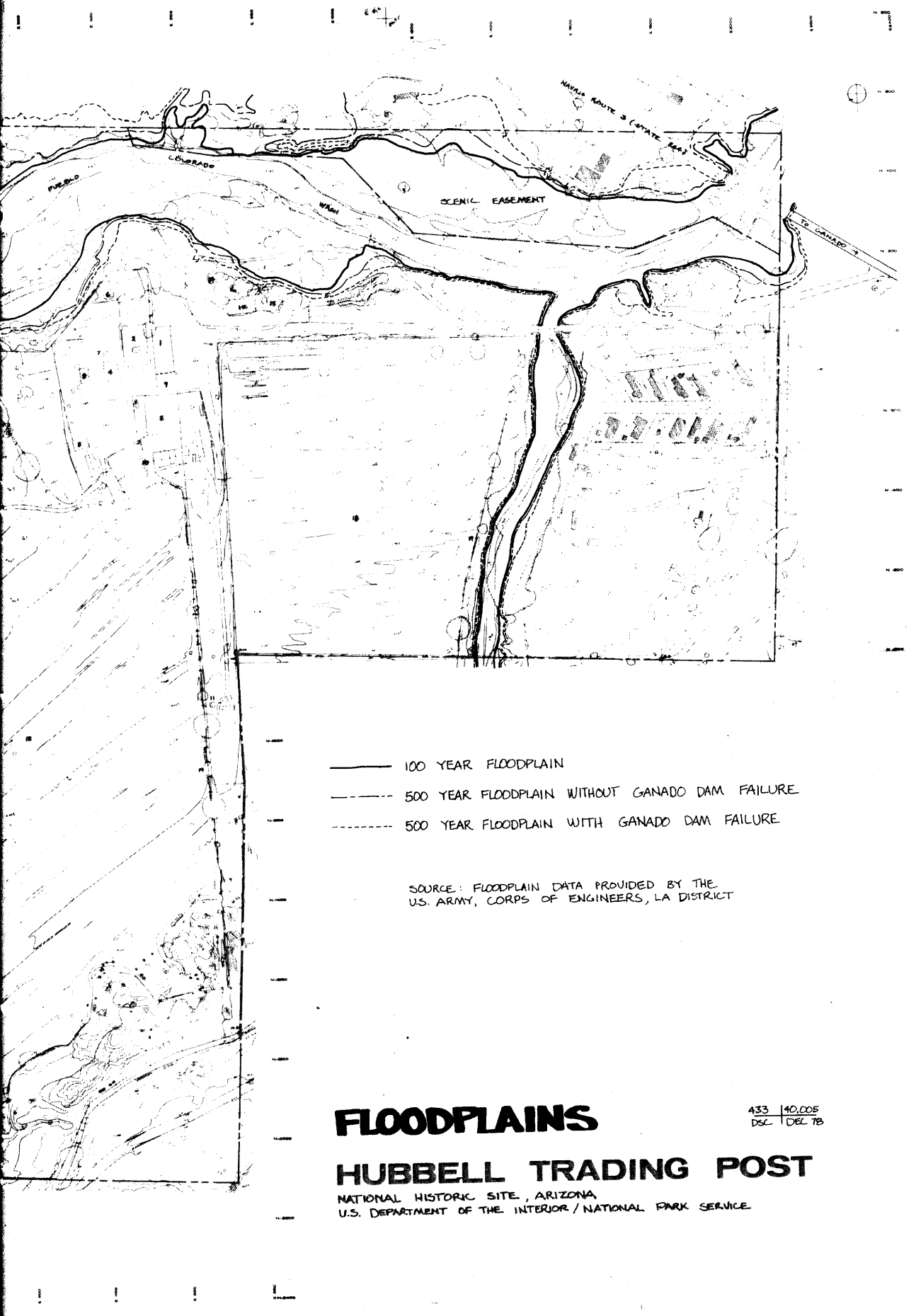
Floodplains

While the Pueblo Colorado Wash is dry much of the year, periodic intense rainfall causes flooding on the main stem and tributary washes. The Pueblo Colorado has a drainage basin above Hubbell Trading Post of 670 km^2 (270 square miles) of which one-third is impounded by a dam at Ganado Lake. The 100 year and 500 year floodplains, as reported by the Los Angeles District of the Corps of Engineers, are shown on the Floodplains map. Much of the site is located on a terrace above these flood levels.



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- 100 YEAR FLOODPLAIN
- - - 500 YEAR FLOODPLAIN WITHOUT GANADO DAM FAILURE
· · · 500 YEAR FLOODPLAIN WITH GANADO DAM FAILURE

SOURCE: FLOODPLAIN DATA PROVIDED BY THE
U.S. ARMY, CORPS OF ENGINEERS, LA DISTRICT

FLOODPLAINS

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Vegetation

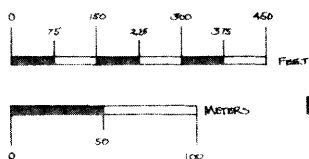
As shown on the Vegetation map, The natural vegetation, largely removed for agricultural purposes, consists of scattered juniper and desert scrub. Rabbitbrush, fourwing saltbush and snakeweed are common. Due to their uncultivated status and grazing over the past 20 years, the irrigated fields now support weedy, exotic species such as field bindweed and russian thistle. Cottonwoods line the washes and the bottomlands of the Pueblo Colorado have been invaded by the exotics, including russian olive and tamarisk. Prior to National Park Service acquisition of Hubbell Trading Post, exotics such as elms were planted in the trading post area, especially on the school tract.

Endangered Species

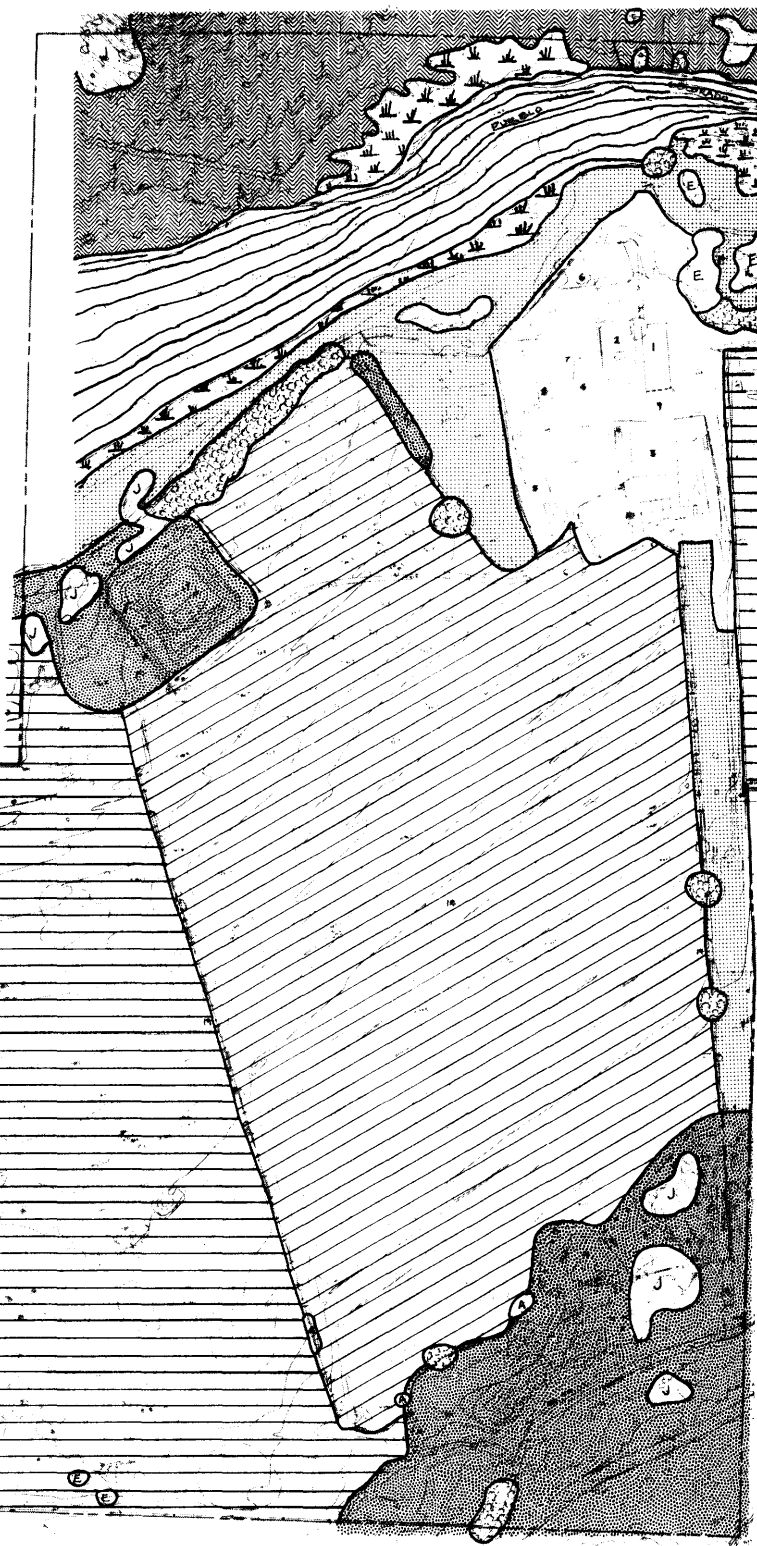
There is no known endangered or threatened plant (Phillips, 1978) or animal species or critical habitat at Hubbell Trading Post National Historic Site.

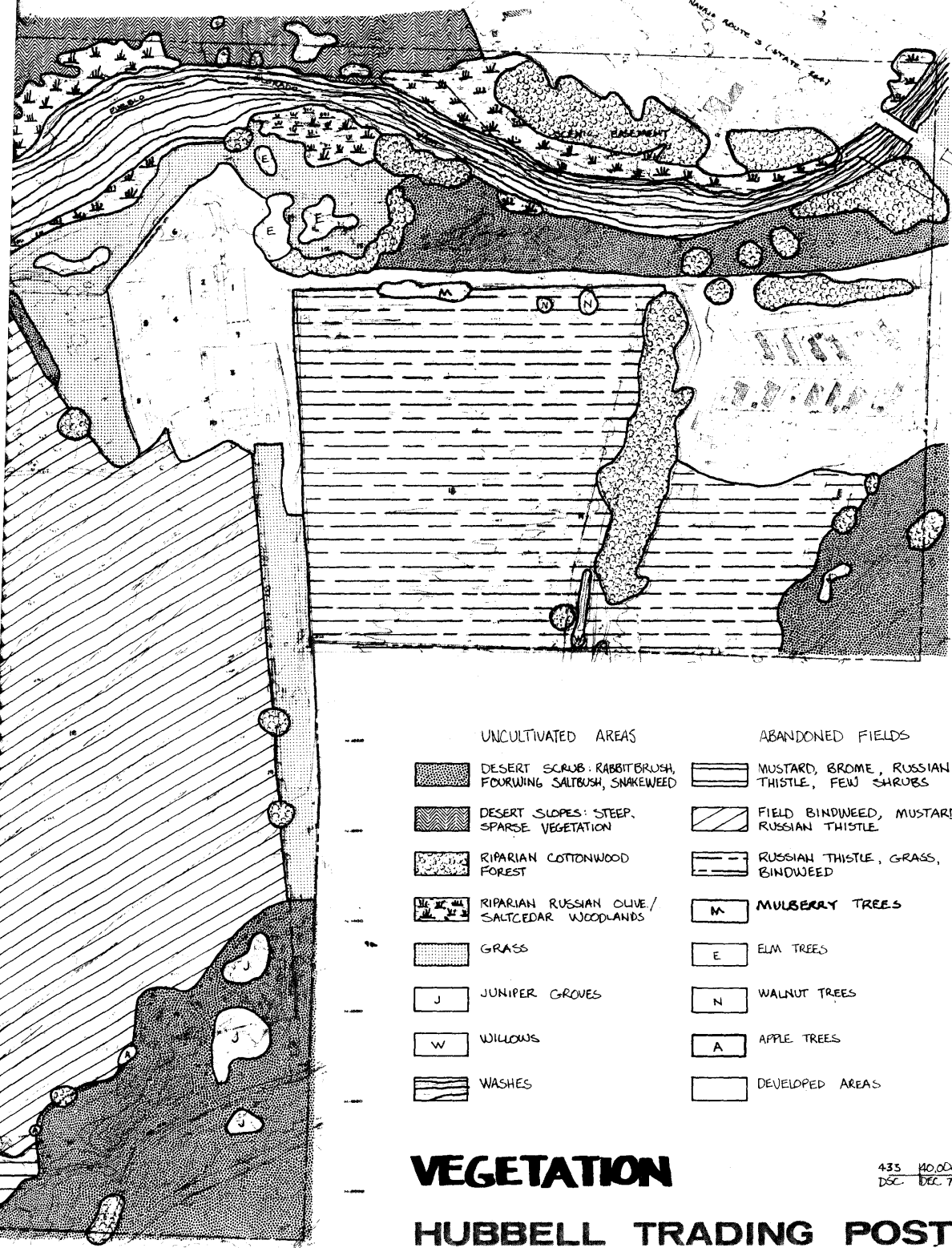
Solar/Wind Energy

Using data collected at Winslow, Arizona, the mean percentage of annual possible sunshine in the region is 75 percent (275 days of clear to partly cloudy skies), varying between 61 percent of the days in January being clear or partly cloudy and June with 90



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VEGETATION

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SOURCE: VEGETATION MAP BY PHILLIPS, 1978

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percent of its days clear or partly cloudy. The combination of high levels of solar incidence (averaging 450-500 langleys per day) and cool winters (winter minimum temperatures average below freezing) makes use of solar energy attractive.

The potential for use of wind energy at Hubbell Trading Post is also good. Strong winds out of the southwest are frequent and often intense, especially in the spring months of the year. The average annual wind velocity recorded at Winslow is 14.6 km per hour (9.1 mph).