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Milwaukee Road Corridor Study

Technical Appendix F

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Title:

NATURAL RESOURCE ASSESSMENT OF THE
CHICAGO MILWAUKEE ST. PAUL AND
PACIFIC R.R. RIGHT OF WAY
RAMSEY TO LACRESCENT, MINNESOTA

By:

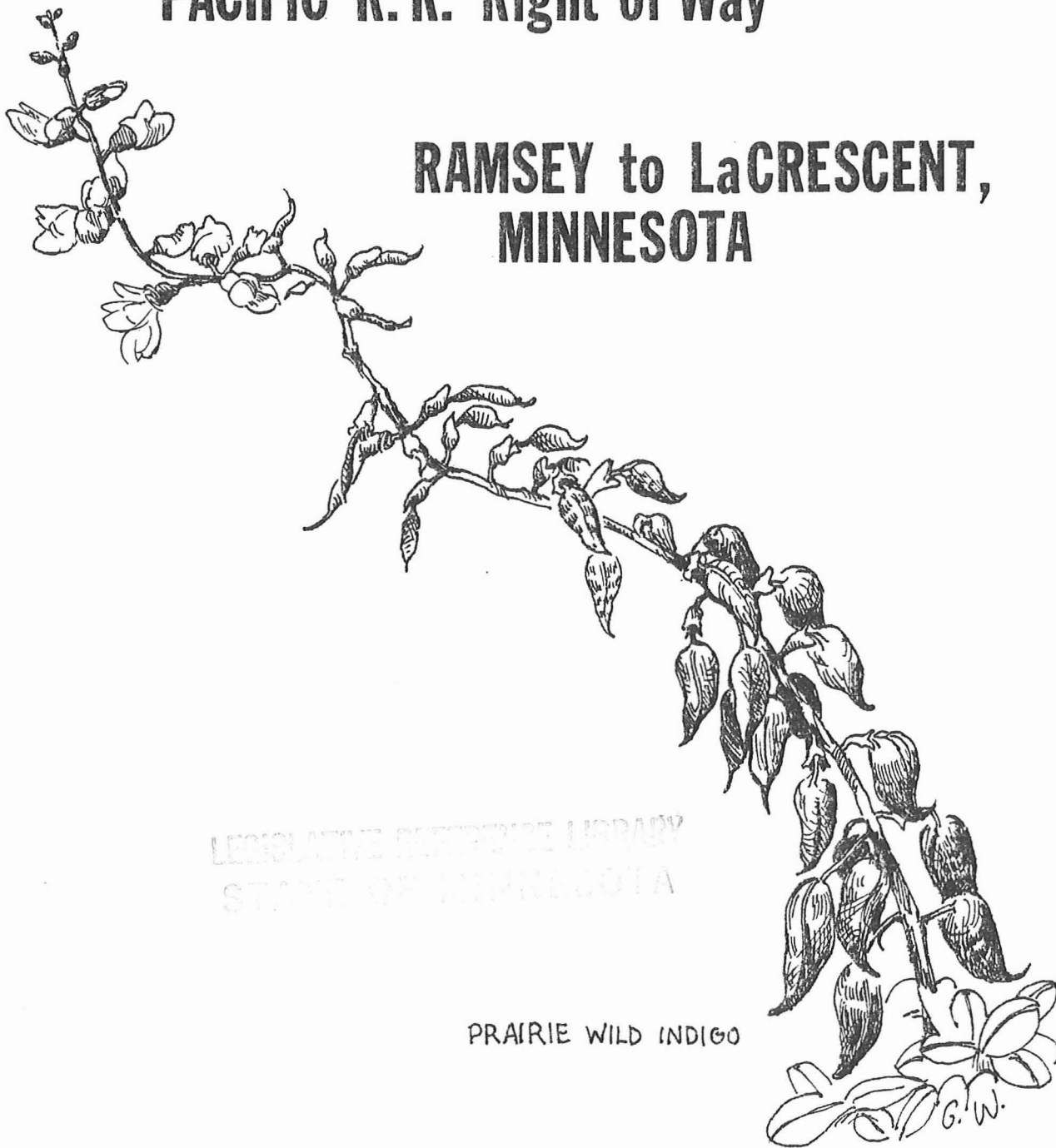
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Department of Natural Resources

NATURAL RESOURCE ASSESSMENT of the CHICAGO MILWAUKEE St. PAUL and PACIFIC R. R. Right of Way

RAMSEY to LaCRESCENT, MINNESOTA



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PRAIRIE WILD INDIGO

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NATURAL RESOURCE ASSESSMENT OF THE CHICAGO
MILWAUKEE ST. PAUL AND PACIFIC RAILROAD RIGHT-OF-WAY
RAMSEY TO LA CRESCENT, MINNESOTA

Abstract

In August of 1979, 103 miles were surveyed along the Chicago, Milwaukee, St. Paul and Pacific Railroad between Ramsey and La Crescent, Minnesota.

The right-of-way (ROW) is a transect representing the Southern Oak Barrens landscape region and its transition to and including the Blufflands landscape region. Eight vegetation community types, one aquatic community and three disturbance types were evaluated for quality and occurrence. The community types and their classifications for the entire ROW and adjacent land from Ramsey to La Crescent are outline in Table 1.

Significant results from this study brought out three communities worthy of Scientific and Natural Area consideration (Money Creek Woods, Hokah Flats, and Ramsey Spring Valley Prairie).

Five species of plant recorded to be unique to the southeastern portions of Minnesota were found (Melica nitans - three flower melic, Eryngium yuccifolium - rattlesnake master, Baptisia leucantha - wild indigo, Baptisia levcophae - prairie wild indigo, and Parthenium integrifolium - wild quinine). The observation of the later two species provided documentation of their existence in Mower County.

The east-west transect nature of the ROW would provide an opportunity for individuals to observe a large number of both the native flora and fauna existing in Minnesota's prairie and woodland biomes.

The significant, interpretive, and wildlife values of these resources are presented.

Table 1: Community types and classifications of the right-of-way and adjacent land between Ramsey and LaCrescent.

Right of Way	Total Miles	Miles Class 1	Miles Class 2	Miles Class 3	Unnatural un-classified
Prairie	34.1	14.7	10.9	8.5	
Disturbed grassland	16.8		8.2	1.5	7.1
Brush	23.2		2.0	14.4	6.8
Agriculture	5.4				5.4
Development	1.5				1.5
Photo interpreted: Ag./disturbed	22.0				22.0
TOTAL	103.0	14.7	21.1	24.4	42.8
Adjacent Land					
Aspen	1.2		.4	.6	.2
River bottom forest	9.2	1.2	3.2	4.8	
Oak-Elm-Walnut	6.4	2.0	2.2	2.0	.2
Maple-Basswood	.6	.4			.2
Oak barrens	1.2		.8	.4	
Brush	2.8	.2	1.0	1.2	.4
Prairie	3.8	.8	1.0	1.6	.4
Disturbed grassland	.2			.2	
Marsh	.6	.2	.2		.2
Open water	3.8				3.8
Agriculture	39.2				39.2
Development	6.5				6.5
Roadside	5.5				5.5
Photo interpreted: Ag./disturbed	22.0				22.0
TOTAL	103.0	4.8	8.8	10.8	78.6

Natural Resource Assessment of
the Chicago Milwaukee St. Paul and Pacific Railroad
Right-of-Way Ramsey to La Crescent, Minnesota

History and Resource Significance

A brief discussion of the history of the portion of the Chicago Milwaukee St. Paul and Pacific railroad between La Crescent and Ramsey, Minnesota is essential to the understanding of the significance of the natural resources potential that might be preserved in this section of right-of-way (ROW) today. This section of railroad was one of the first to be built in the state of Minnesota. It was brought into being by the Minnesota Enabling Act of February 26, 1857; an Act of Congress transferring lands to the Territory of Minnesota that were to be re-allotted to companies for the purposes of constructing railroads.

In 1857 the territorial legislature chartered four "Land Grant" railroad companies, one of which was the Root River Valley and Southern Minnesota Railroad, which was to build a line from Grand Crossing (La Crosse) west along the Valley of the Root River. During the period 1858-1859 the Root River Valley and Southern Minnesota constructed approximately 20 miles of grade between La Crosse west to Houston, however, no tracks were laid at this time.

In the following period of time, railroad construction deadlines were not met and as a result the state foreclosed and the Root River Valley

and Southern Minnesota Railroad was split into two divisions -- the Southern Minnesota and the Minnesota Valley Railroad. The Civil War brought a temporary halt to railroad construction in Minnesota and it was not until 1866 that the Southern Minnesota Railroad began to lay track on the previously graded section between La Crosse and Houston. By 1870 the line was complete to Winnebago, Minnesota and by 1880 it was complete to the South Dakota border. In 1874 the Milwaukee and St. Paul railroad became the Chicago Milwaukee and St. Paul; this railroad then took over the Southern Minnesota Railroad Company in 1880 (Prosser 1966).

It is the early completion date and the east-west alignment of this railroad across southern Minnesota that provides the key to the possible natural resource significance of the railroad (ROW). The completion of the railroad was done at a time when undisturbed native vegetation was still common in southern Minnesota and the ground disturbed by the railroad construction was undoubtedly revegetated with these native species. The purpose of this study was to determine if populations of native vegetation had been provided a sanctuary within, or adjacent to, the ROW from the years of disturbance from agricultural and other of white mans activities that followed the completion of the railroad. Since almost all of southern Minnesota has been placed in agricultural or timber production in the past, the existence of natural undisturbed communities would be of worthwhile significance to a number of the Department of Natural Resources program either directly or indirectly in their attempts to preserve and perpetuate certain natural resources. Discovery of natural undisturbed communities, rare, endangered or threatened species, would be of interest to the states Natural Resources Heritage program, Scientific and Natural Areas program, Non-Game

Species program, and State Parks Vegetation Management program, as well as meeting one of the criteria established for state trail designation by the Outdoor Recreation Act of '75 of providing "travel along a route which connects areas or points of natural scientific cultural and historic interest."

General Resource Description

The east-west alignment of the ROW provides a transect or corridor that proceeds thru two different Minnesota landscape regions. A greater portion of the ROW from Fountain to La Crescent, Minnesota follows the Root River Valley through the Blufflands landscape region. From Ramsey to Fountain it proceeds thru a portion of the state that was originally an Oak Savanna (oak forest and prairie types) -- Minnesota's Southern Oak Barrens landscape region. (Kratz and Jensen 1977).

A. Southern Oak Barrens Landscape Region

The community structure and species that made up the prairie of the Southern Oak Barrens is little known because almost all of the Southern Oak Barrens has been placed in agricultural production. No large representative communities remain to give us a clear picture of the original landscape. It is therefore necessary to develop qualitative assumptions based on remaining small parcels that contain native species. Preliminary investigations of secondary sources indicated that there was a high degree of probability for finding undisturbed prairie along the ROW itself because of previous observations made along railroads constructed at a corresponding time. A field check revealed that the ROW between Ramsey to Spring Valley contained a population of native species, excellent for its diversity,

vigor, and continuity, with only minor degrees of disturbance. It was therefore decided to evaluate this portion of the ROW to use as a model against which the remaining portion of trail contained in the Southern Oak Barrens from Spring Valley to Fountain could be classified.

B. Blufflands Landscape Region

The Minnesota Blufflands are a portion of the large driftless area of southeastern Minnesota. Marscher's map indicates that Big Woods (Maple-Basswood) vegetation type was the predominant community at the time of white settlement (Marschner 1930). A major portion of this area is vegetated with hardwood forest today, however, the south facing slopes are commonly covered with goat prairies and oak woods due to microclimate factors.

At the far eastern end of the railroad grade the valley widens to over one mile. In this area the river and the geology of the river dominate the ecological processes. The vegetation is represented by a very broad range of marsh and floodplain forest communities.

Most of the vegetation found in the Blufflands of Minnesota are an extension of the eastern hardwood forests of the United States. This portion of the state, therefore, harbors a number of species found more commonly in eastern and southern parts of the U.S. but are not found anywhere else in Minnesota. Examples of trees occurring naturally only in the Blufflands are Black Maple, Acer nigrum; Black Walnut, Juglans nigra; and Shagbark Hickory, Carya ovata.

Methods

The objective of the sampling was to characterize the natural resources which are in or have good visual access from the ROW. Different resources have different visual access characteristics. Individual forest types, for example, need to be seen close at hand to fully appreciate the differences. Goat prairies have several dramatic features which can be readily appreciated from a considerable distance. Marshes and flat prairies are intermediate. Physical access to resources outside the ROW was not considered.

For sampling purposes the ROW divides itself rather naturally into two sections. One is west of Fountain where the ROW crosses prairie country. In this section the ROW tends to be straight and flat. The ROW is intersected every two, sometimes one, miles by section roads. The section east of Fountain consists of prairie or woods-covered hillsides or marshy flats. The ROW is often curving and is crossed by roads only infrequently. These characteristics present different needs or limitations for sampling.

The Ramsey to Fountain portion was sampled by assuming that it consisted of a single but varying prairie unit. The one or two mile section roads then provided systematic access. Aerial photo interpretation was not necessary or possible with the existing aerial photos. At each access point one, sometimes two, samples were taken. Each sample consisted of recording, for a $\frac{1}{4}$ mile strip, all the species associated with prairies (visible at this particular time of year) and the degree of disturbance. Disturbance was evaluated by various accepted disturbance and non-disturbance indicator species and by encroachment of woody species.

A "1", the highest rating, indicated a low degree of disturbance. Plant communities that are little disturbed are unusual and often of statewide significance. Communities disturbed beyond recognition were called disturbed grasslands or a type of brushland, as appropriate. A "3" indicated very disturbed vegetation such as can be found almost anywhere.

In the Fountain to La Crescent section the adjacent lands were given a preliminary screening, based on aerial photo interpretation, and segregated into agricultural/developed land and potential natural areas. The former was discarded from the sampling plan. The natural areas, consisting primarily of marsh, various forest types and goat prairie were sampled at quarter mile intervals. The ROW was initially disregarded in the sampling plan since, it was assumed, the ROW was always radically disturbed, cutover land. This did not turn out to be entirely true so the ROW was sampled along with the adjacent land but only in those areas selected for the potential of the adjacent lands. The type and degree of disturbance (quality) of the vegetation was noted for the ROW and adjacent land on each side of the ROW at determined quarter mile sampling points. If, in the course of walking the ROW, other significant features were observed these were briefly described and mapped.

Natural Resource Summary

I. RAMSEY TO SPRING VALLEY

A. Community Type: Separate evaluations of the ROW and adjacent land was completed for this portion of the study. The ROW was found to be predominately tall grass prairie with an excellent representation, both in diversity and vigor, of native prairie plants. Prairie was the only natural community-type observed in the entire ROW. Of 103 miles of railroad grade surveyed 34.1 miles were typed as prairie, of this, 25 miles (73%) were recorded between Ramsey and Spring Valley. Table 2 outlines the community types on the ROW and on adjacent land from Ramsey to Spring Valley. The adjacent land was found to be primarily to be in agricultural production. It is assumed that occasional wildfires sparked by railroad activity was instrumental in maintaining this community. There were also very few woody species in this section, this would have reduced the amount of spraying and mechanical removal techniques required to maintain the ROW and reduced the disturbance to native species.

It should be pointed out that due to the limited time allotted for this study (Aug. 6 - Aug. 17) that only the plants in bloom or those whose vegetative characteristics were positively known to the researchers could be identified. Since approximately 17 different prairie species are known to come into flower each week there is the distinct and strong possibility that the diversity of this prairie community has been grossly underestimated (Nichols 1978).

Table 2: Community types and classifications of the right-of-way and adjacent land between Ramsey and Spring Valley.

Right of Way	Total Miles	Miles Class 1	Miles Class 2	Miles Class 3	Unnatural un-classified
Prairie	25.0	13.6	8.4	3.0	
Disturbed grassland	1.5			1.5	
Brush	.7				.7
Agriculture encroachment	2.3				2.3
Development	1.5				1.5
TOTAL	31.0	13.6	8.4	4.5	4.5
Adjacent Land					
Prairie	1.6	.8		.8	
Agriculture	23.7				23.7
Development	4.1				4.1
Roadside	1.6				1.6
TOTAL	31.0	.8		.8	29.4

There is the strong possibility that plants more rare than those observed during the period of this investigation exist on this tract; more intensive investigation over the entire growing season is needed to substantiate this assumption.

B. Recommendation for Significant Resource Areas:

The stated purpose of the work plan for this project was to "determine segment-by-segment, the highest and best use of the abandoned Chicago, Milwaukee, St. Paul and Pacific ROW between La Crescent and Ramsey." It is therefore appropriate to examine this particular stretch in terms of the most protective land use designation that the state can apply to a piece of land, a Scientific and Natural Area. Scientific and Natural policy lists that one or more of the following considerations to be used for area selection: (SNA policy 1979)

- 1) Rareness on a national, state or landscape region scale.
- 2) Excellence and completeness of the natural features found in the area.
- 3) Representatives of the area in relation to the landscape regions of the state.
- 4) Degree to which an area or its elements are threatened with incompatible use.
- 5) Degree of protection afforded similar elements elsewhere in the landscape region.

The portions of ROW evaluated between Ramsey and Spring Valley, Minnesota definitely qualify under all five of the criterion above.

A number of plants which are either very sensitive or very tolerant are recognized by authorities as being strong "indicator"

species of the amount of disturbance sustained by plant communities. A number of species were found during this study which are indicators of relatively undisturbed prairie (Heitlinger 1979).

<u>Aster laevis</u>	silky aster
<u>Amorpha canescens</u>	lead plant
<u>Liatris pycnostachya</u>	gay feather
<u>Pedicularis canadensis</u>	prairie lousewort
<u>Petalostemum candidum</u>	white prairie clover
<u>Petalostemum purpureum</u>	purple prairie clover
<u>Viola cf. pedatifida</u>	birdsfoot violet

Fifty additional prairie species were observed along the ROW during the period of this study (see appendix I).

During the short period of this survey four species of plants of very limited distribution and restricted to southeastern Minnesota were observed along the ROW.

<u>Baptisia leucantha</u>	wild indigo
<u>Baptisia leucophaea</u>	prairie wild indigo
<u>Eryngium yuccifolium</u>	rattlesnake master
<u>Parthenium integrifolium</u>	wild quinine

Wild indigo occurred in 11% of the plots surveyed between Ramsey and Spring Valley and rattlesnake master in 85%. Wild quinine is noted to have infrequent and occasional distribution and is rare in Minnesota. Wild quinine has not been documented in Mower County since 1939 and the results of this survey documents the present occurrence of this species and updates county records. Wild quinine occurred in 59% of the inventoried plots. The occurrence of prairie wild indigo presents a new county record and was found to occur in 3% of the plots surveyed.

Voucher specimens of these latter two species were collected and shall be submitted to the University of Minnesota Herbarium.

The intensive agricultural land-use has left very few undisturbed prairie areas in southeastern Minnesota. Railroad right-of-ways may be among the few remaining locations which these species occur. The following prioritized recommendations deal with the possible means of preserving these extremely valuable resources as part of Minnesota's natural heritage.

Ramsey to Spring Valley Prairie Area

The following are suggested possibilities for preservation and management of this area.

- a. Inclusion of this section as a Scientific and Natural Area sub-unit within the state trail system if the ROW is purchased for this purpose. Management will be to maintain prairie resources.
- b. Fee purchase of this section of ROW for Scientific and Natural Areas purposes only. Management - same as above.
- c. Cooperative agreement between the railroad company and the Department of Natural Resources such as a conservation easement for Scientific and Natural Areas purposes. Management - same as above.
- d. Cooperative agreement or fee purchase from subsequent land owners of conservation easements or fee title for Scientific and Natural Areas purposes. Management - same as above.

Note: Recommendations contained in (c) and (d) above would not necessarily negate use by local landowners. For example: limited haying on the prairie community would provide economic benefits to these landowners and would be a beneficial prairie management technique if set up on a properly determined rotational basis.

Prairie Area Located at Study Plot P11W

Located at T.103N, R.15W, Section 19 (one mile west of Dexter, Minnesota). This area located on land adjacent to the ROW, contained approximately five acres of wet unplowed prairie. This tract is presently isolated between a county ditch and the railroad grade. It is suggested that this area be further evaluated for inclusion into the Scientific and Natural Area program.

C. Wildlife Potential

Jack Heather, Area Wildlife Manager in southeastern Minnesota was consulted regarding the wildlife potential of the ROW. Mr. Heather worked as Wildlife Manager for the Casey Jones Wildlife Management Area (WMA) for seven years. The Casey Jones WMA is an abandoned railroad ROW lying between Pipestone and Woodstock in eastern Pipestone County.

Statement of Value

"In many ways, the western portion of the La Crescent to Ramsey railroad ROW closely resembles the Casey Jones WMA. There is one difference however -- the subject ROW passes through more intensively farmed land than its Pipestone counterpart. The value of such an area is greater."

"The wildlife values of an undisturbed parcel of grassland in an intensively cropped area are great. One need only look to private and state-owned lands managed for wildlife to verify the

need and value of undisturbed cover."

"Non-game birds, such as the bobolink, meadowlark, grasshopper sparrow, kestrel, eastern kingbird, goldfinch and a myriad of others need and use the grasslands provided by the railroad (ROW) as nesting and/or feeding areas."

"Game species found along the ROW, and dependent upon grassland habitat areas for production and rearing of young, include the cottontail rabbit, hungarian partridge, ring-neck pheasant, red fox, jackrabbit and badger. In addition, areas of shrub growth along the railroad line provide good fawning sites for white-tailed deer."

"Entomological and herpetological values of a linear parcel of grassland such as this railroad are not well understood because of the limited amount of study. (Refer to the report prepared by Minnesota Natural Heritage Program on the rare elements and natural diversity found along the proposed Root River Trail). Nevertheless, the values are there and this vegetation system should be preserved to foster study of these lesser known and understood life forms."

"Considering the intensive character of land use in the vicinity of the western portions of the La Crescent to Ramsey line, the implications of allowing this parcel to be fragmented by these special use interests are great, especially for wildlife resources."

"These wildlife values, and all other natural resource values tied to this line, should not be lost."

D. Interpretive Potential

The interpretive potential of the Ramsey to Spring Valley section of ROW could only be termed exceptional. Land that is of scientific and natural area quality adjacent to land used for modern agricultural purposes is perfectly suited to the expressed goals of the Department of Natural Resources Interpretive program of illustrating man and land relationships. The natural prairie community that exists here could be used to illustrate the changes that have occurred to Minnesota flora since the advent of modern intensive agricultural practices. Interpretive programs could point out that today's successful agricultural economy is a product of the native vegetation and its resulting formation of deep rich top soil that originally brought the farming community to Minnesota. Further, present research is being conducted into the potential use of these native plants for future agricultural use, specifically the University of Iowa is conducting research using that states natural preserves to determine suitability and use of native plants for pasture and hay production. Such research data interpreted at this site to the local farming community may have economic as well as educational benefits. This area would also provide educational benefits to a general public audience as well as to the higher education system in Minnesota. In interviewing secondary sources for this study, Mr. Vincent Shay, Director of the Hormel Nature Center at Austin, Minnesota, would use this particular section as a place to take his audiences on prairie walks, and Dr. Paul Jensen of Concordia College, Northfield, Minnesota stated

that he was "very impressed" with this ROW and that he would use it as a site to conduct student field trips too, if it remained available.

II. SPRING VALLEY TO FOUNTAIN

A. Community Type

On the Marschner map of original Minnesota vegetation the section of ROW between Spring Valley and Fountain is shown as proceeding through an area of "scattered trees and groves of oaks (mostly bur oak) of scrubby form with some brush and thickets..." The data gathered during the investigation of this section of ROW indicated considerable encroachment of brushy species when compared against the western portion between Spring Valley and Ramsey. Invading brush occurred on the ROW .7 miles (2%) between Ramsey and Spring Valley while it was found 3.8 (25%) between Spring Valley and Fountain. Inversely, the prairie decreased along the ROW from 25 miles (80%) between Ramsey and Spring Valley to 4.3 miles (28%) between Spring Valley and Fountain. (See Table 3).

Observations made during the study and review of the data indicated that this section was, and is today, an ecotone or zone of tension between the western portion of prairie and the eastern Blufflands section of hardwood forests traversed by the ROW. Tree and brushy species were continually attempting to invade this zone and were held in check by an early history of prairie wildfires. Today this situation offers an explanation of why this particular section of railroad is lacking in a good representation of prairie species. With the absence

Table 3: Community types and classifications of the right-of-way and adjacent land between Spring Valley and Fountain.

R.O.W.	Total Miles	Miles Class 1	Miles Class 2	Miles Class 3	Unnatural Unclassified
Prairie	4.3	1.1	.5	2.7	
Disturbed Grassland	4.8				4.8
Brush	3.8				3.8
Agriculture	2.1				2.1
% each class	15.0	1.1	.5	2.7	10.7

ADJACENT LAND	Total Miles	Miles Class 1	Miles Class 2	Miles Class 3	Unnatural Unclassified
Prairie	.6		.6		
Agriculture	8.3				8.3
Development	2.2				2.2
Roadside	3.9				3.9
% each class	15.0		.6		14.4

of the prairie fires to hold the shrubby species in check it is surmised that the railroad companies along with the adjacent highway in some areas attempted to eliminate woody species encroachment and maintain the ROW with a good deal of spraying and mechanical methods of removal. Since herbicides are not selective for broad leafed woody species, broad leafed prairie species were eliminated from the grade as well.

It should also be noted that a great deal of agricultural encroachment was observed and recorded on this particular study section. In many places row crops were planted within 12-15 ft. of the centerline of the railroad tracks, and in another instance the ROW had been mowed for hay. The disturbance created from these activities had completely eliminated any evidence of native vegetation. Despite the disturbance along this portion of the ROW scattered remnants of prairie in the form of occasionally occurring prairie species was noted. Restoration of the native species of this entire portion of the ROW would be extremely expensive; however, some small sections may be possible to restore with prairie management techniques such as prescribed burning, plantings, etc.

As noted in the previous section, this portion of the study area had considerable fewer of the prairie species than the more westerly portion of the ROW. Many species of alien as well as native species indicating disturbance were found in this area. The qualitative analysis of the community types found in this section is indicative of this situation and is summarized in Table 3.

A great deal of this area was left untyped -- disturbance had left the area with little or no natural community structure making it impossible to identify or characterize it as any natural community "type".

B. Recommendations for Significant Resource Areas

Due to the disturbed nature of this portion of ROW no significant natural resources were observed during this study.

C. Wildlife Potential

The potential of this particular portion of ROW for nesting, and winter habitat for game and non-game species of wildlife was considered undiminished by the fact that the natural vegetation had been disturbed. The agricultural encroachment on this portion of ROW, however, has destroyed habitat. This may have an extremely adverse effect on local populations of animals previously dependent on these sections of railroad grade for habitat.

D. Interpretive Potential

The absence of natural elements in this portion of the trail diminishes its interpretive potential; however, "nothing" is the only thing that can not be interpreted. This particular portion of the trail could be used to illustrate disturbance of natural communities; however, this particular site is not necessary for this; the evidences of disturbances to natural communities being readily available almost anywhere throughout the state. The most

interesting interpretable feature found here, but one very difficult to illustrate, is the ecotone or zone of tension between the prairie and woodland biomes. The disturbance to this area has left the evidence of this zone of tension fractured and "jumbled" making it difficult for all, but those with a trained eye to recognize.

III. FOUNTAIN TO LA CRESCENT

A. Community Types

The Marschner map of the original vegetation of Minnesota show the section of ROW between Fountain and La Crescent as proceeding through an area of oak openings and barrens on the west to Big Woods type on the east. Interspersed are wet and dry prairies and river bottom forests.

This area contained the most diverse community types found along the ROW, and represented all the community types found in S.E. Minnesota. The vegetation along this section of the ROW (see Table 4) was classified into twelve types describing the adjacent lands and four types describing the ROW itself. Of the 57 miles of ROW, 22 miles were photo typed as agricultural, developed, near roadways, or not of natural resource significance and not field checked. The remaining 35 miles were field checked, classified, and rated.

Table 4: Community types and classifications of the right-of-way and adjacent land between Fountain and La Crescent.

Right of Way	Total Miles	Miles Class 1	Miles Class 2	Miles Class 3	Unnatural un-classified
Prairie	4.8		2.0	2.8	
Disturbed grassland	10.5		8.2		2.3
Brush	18.7		2.0	14.4	2.3
Agriculture	1.0				1.0
Photo interpreted: Ag./disturbed	22.0				22.0
TOTAL	57.0		12.2	17.2	77.6
Adjacent Land					
Aspen	1.2		.4	.6	.2
River bottom forest	9.2	1.2	3.2	4.8	
Oak-Elm-Walnut	6.4	2.0	2.2	2.0	.2
Maple-Basswood	.6	.4			.2
Oak barrens	1.2		.8	.4	
Brush	2.8	.2	1.0	1.2	.4
Prairie	1.6		.4	.8	.4
Disturbed grassland	.2			.2	
Marsh	.6	.2	.2		.2
Open water	3.8				3.8
Agriculture	7.2				7.2
Development	.2				.2
Photo interpreted: Ag./disturbed	22.0				22.0
TOTAL	57.0	4.0	8.2	10.0	34.8

Of these natural areas, river bottom and oak-elm-walnut forests were the predominant types, comprising 9.2 and 6.4 miles. Of these, however, only 1.2 and 2.0 miles were considered free of significant disturbance. Oak barrens and prairie occupied 1.2 and 1.6 miles, none of which were of good quality. Maple-Basswood was surprisingly rare considering its important in the original Bluffland vegetation. A large marsh, Hokah Flats, of excellent quality was found in the eastern most area. Agriculture and development occurred along 7.4 miles surveyed. Another 22 miles of agriculture and development were determined to exist along the ROW from aerial photo interpretation. Of the total 57 miles, 4 miles were classified "1", 8.2 classified "2", and 10 were classified as "3". Significant species such as Black Walnut was observed in 13% of the river bottom forest and 62% of the oak-elm-walnut community. Other trees found in this section were hackberry and butternut. Red Cedar was observed mostly in association with goat prairie. Existing in this section is shagbark hickory, but was only observed at one sampled point.

The ROW itself was primarily disturbed grasslands or brush; however, 4.8 miles of this section was low quality prairie. Also, 5.4 miles of the sampled area was encroached by agriculture; another 22 miles were not field checked for encroachment.

B. Recommendation for Significant Resource Areas

1) Hokah Flats

150 acres in and around T.104N, R.5W, Section 35 between sample points 65 to 66. This area, particularly that south of the ROW contains a high quality marsh with a wide diversity

of undisturbed plant communities. A portion of the ROW in this section is one of only four locations in which the grass plant Melica nitans is known to occur in Minnesota (Smith, personal communication, DNR Natural Heritage Program). This particular plant has been designated as "threatened" in the state of Wisconsin. It is recommended this area be further studied using the State Natural Heritage Program data to determine its suitability for designation as a scientific and natural area.

2) Money Creek Woods

This area located between study plots 49 and 52 in T.104N, R.7W, Sections 28, 33, 34, contains good examples of mature oak and some maple-basswood forests. It is recommended the area be evaluated for registry with the Scientific and Natural Area program, and managed according to these evaluation recommendations by the State Division of Forestry.

C. Wildlife Potential

The railroad (ROW) from Fountain to La Crescent contains much of the same wildlife potential as described for the western portions of the ROW. In addition, the eastern Bluffland region of the transect adds species native to the eastern hardwood forest. The report prepared by the Minnesota Natural Heritage Program on the rare elements and natural diversity summarizes the unique game and non-game species found along or near the railroad ROW.

D. Interpretive Potential

This section of ROW provides an excellent opportunity to interpret features that are uncommon to other portions of the state.

The hardwood forests of Minnesota's Bluffland regions contain many species of plants and animals that are common to eastern hardwood forests of the United States. These species are found nowhere else in the state. At several locations the railroad runs adjacent to State Memorial Hardwood Forest lands where some of these species may be observed from the ROW. These adjacent State forest lands also provide the opportunity to interpret all the aspects of hardwood forest management and the relationship between good forest management techniques and erosion control, water quality improvement and trout stream quality.

On this section of grade and located in the ROW is one site where the grass plant Melica nitans is known to occur in Minnesota. This unique occurrence provides both an opportunity to interpret the significance of rare plants and provide an opportunity for people to see a plant rare to Minnesota.

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APPENDIX I

Listing of prairie species (Rock, 1971) and the frequency of occurrence from Ramsey to Spring Valley and from Spring Valley to Fountain. * Indicates species observed but frequency data was not collected.

GRAMINAE: GRASS FAMILY	Ramsey Spring Valley	Spring Valley Fountain
<u>Andropogon girardi</u> Big Blue Stem	100%	67%
<u>Andropogon scoparius</u> Little Blue Stem	3%	33%
<u>Bouteloua curtipendula</u> Side Oats Gramma	*	*
<u>Elymus canadensis</u> Canadian Wild Rye	44%	17%
<u>Muhlenbergia sp.</u> Muhly	9%	0%
<u>Panicum virgatum</u> Switch Grass	3%	0%
<u>Sorghastrum nutans</u> Indian Grass	*	*
<u>Spartina pectinata</u> Porcupine Grass	47%	0%
<u>Stipa spartina</u> Cord Grass	56%	0%
LILIACEAE: LILY FAMILY		
<u>Allium canadense</u> Wild Garlic	3%	0%
RANUNCULACEAE: BUTTERCUP FAMILY		
<u>Anemone canadense</u> Canadian Anemone	15%	8%
<u>Anemone cylindrica</u> Thimble Weed	15%	0%
<u>Thalictrum dasycarpum</u> Tall Meadow Rue	12%	0%
ROSACEAE: ROSE FAMILY		
<u>Geum triflorum</u> Prairie Smoke	*	0%
<u>Speria alba</u> Meadow Sweet	53%	0%
FABACEAE: BEAN FAMILY		
<u>Amorpha canescens</u> Lead Plant	71%	0%
<u>Astragalus canadense</u> Milk Vetch	3%	0%
<u>Baptisia leucantha</u> Wild Indigo	15%	0%
<u>Baptisia leucophaea</u> Wild Prairie Indigo	3%	0%
<u>Desmodium canadense</u> Canadian Tick Trefoil	44%	42%
<u>Lespedeza capita</u> Round-headed Bush Clover	6%	33%
<u>Petalostemum candidum</u> White Prairie Clover	3%	0%
<u>Petalostemum purpurea</u> Purple Prairie Clover	50%	8%
APIACEAE: PARSLEY FAMILY		
<u>Circuta maculata</u> Water Hemlock	26%	0%
<u>Oxypolis rigidior</u> Cowbane	6%	0%
<u>Zizia aurea</u> Golden Alexanders	*	*
<u>Eryngium yuccifolium</u> Rattlesnake Master	85%	8%
VIOLACEAE: VIOLET FAMILY		
<u>Viola cf. pedatifida</u> Prairie violet	3%	0%

APPENDIX I (continued)

	Ramsey Spring Valley	Spring Valley Fountain
APOCYNACEAE: DOGBANE FAMILY		
<u>Apocynum androsaemifolium</u> Spreading Dogbane	*	*
LABAITAE: MINT FAMILY		
<u>Monarda fistulosa</u> Burgomot	71%	50%
<u>Pycnathemum virginianum</u> Mountain Mint	44%	25%
EUPHORBIACEAE: EUPHORBIA FAMILY		
<u>Euphorbia corollata</u> Flowering Spruge	*	*
PRIMULACEAE: PRIMROSE FAMILY		
<u>Oenothera sp.</u> Evening Primrose	35%	33%
SCROPHULARIACEAE: FIGWORT FAMILY		
<u>Pedicularis canadense</u> Lousewort	0%	8%
<u>Veronicastrum virginicum</u> Culvers Root	56%	12%
COMPOSITAE: COMPOSITE FAMILY		
<u>Artemisia ludoviciana</u> White Sage	*	*
<u>Aster sericeus</u> Silver Aster	0%	*
<u>Coreopsis palmata</u> Coreopsis	29%	8%
<u>Helianthus annus</u> Common Sunflower	8%	8%
<u>Helianthus grosse-serratus</u> Sawtooth Sunflower	29%	0%
<u>Helianthus maximiliana</u> Maximilians Sunflower	0%	8%
<u>Helianthus laetiflorus</u> Showy Sunflower	6%	0%
<u>Heliopsis helianthoides</u> Ox-eye	32%	8%
<u>Liatris ligustilas</u> Blazing Star	50%	0%
<u>Liatris pycnostachya</u> Gay Feather	85%	8%
<u>Parthenium integrifolium</u> Wild Quinine	59%	8%
<u>Ratibida pinata</u> Grey Coneheaded Coneflower	82%	41%
<u>Rudbeckia hirta</u> Black-eyed Susan	6%	8%
<u>Rudbeckia laciniatum</u> Greenheaded Coneflower	50%	0%
<u>Silphium laciniatum</u> Compass Plant	44%	8%
<u>Silphium perfoliatum</u> Cup Plant	6%	8%
<u>Solidago juncea</u> Early Goldenrod	*	*
<u>Solidago rigida</u> Hara-leaved Goldenrod	*	*
<u>Solidago tenuifolia</u> Slender Fragrant Goldenrod	*	*
<u>Veronia fas cicularia</u> Ironweed	*	*

APENDIX II

Description of the natural community types (adapted from Heinselman, 1974 and Cutris, 1971) described in Chicago, Milwaukee, St. Paul and Pacific Railroad Resource Assessment.

- ASPEN: Pioneer Forests dominated by quaking aspen (Populus tremuloides) and big tooth aspen (Populus grandidentata) and having a successional under-story or canopy component of broadleaf trees characteristic of the oak, elm, walnut, or maple basswood type. The agent of disturbance was probably fire or logging in most cases. In the absence of further disturbance this type will succeed to the longer living, more shade tolerant hardwood species.
- BRUSH: A mosaic of low shrub thickets and small patches of trees located primarily between the western prairie portion and the eastern hardwoods section. Areas typed as brush typically represented spots of brush encroachment upon the once-native prairie. The common brushy invaders included American Elm (Ulmus americana), Ash (Fraxinus sp.), Black Maple (Acer nigra), and Aspen (Populus tremuloides and P. grandidentata).
- MAPLE-BASSWOOD: Part of the "Big Woods" Forests (Heinselman) dominated by sugarmaple (Acer saccharum) and Basswood (Tilia americana). Maple-Basswood forests are found in richer soils upland areas. The Maple-Basswood Forest is extremely sensitive to fire and represents the completion of the successional sequence as a climax forest community type.
- MARSH: The marshes observed were type III wetlands (Martin et. al. 1953) having open and standing water and emergent vegetation such as Arrowhead (Sagittaria latifolia) and Pickerel Weed (Pandera cordata). Soils of these shallow freshwater marshes are normally waterlogged during the growing season.
- OAK BARRENS: Fire maintained community, usually a buffer between prairies and the eastern hardwood forest. Sandy soils are generally associated with this type. The barrens consists of oak groves or single trees (primarily Quercus macrocarpa Bur Oak) groves in a matrix of tall grass prairie. Very few representational areas of this type remain today. Many of the areas typed under this classification in this survey were heavily grazed.

APPENDIX II (continued)

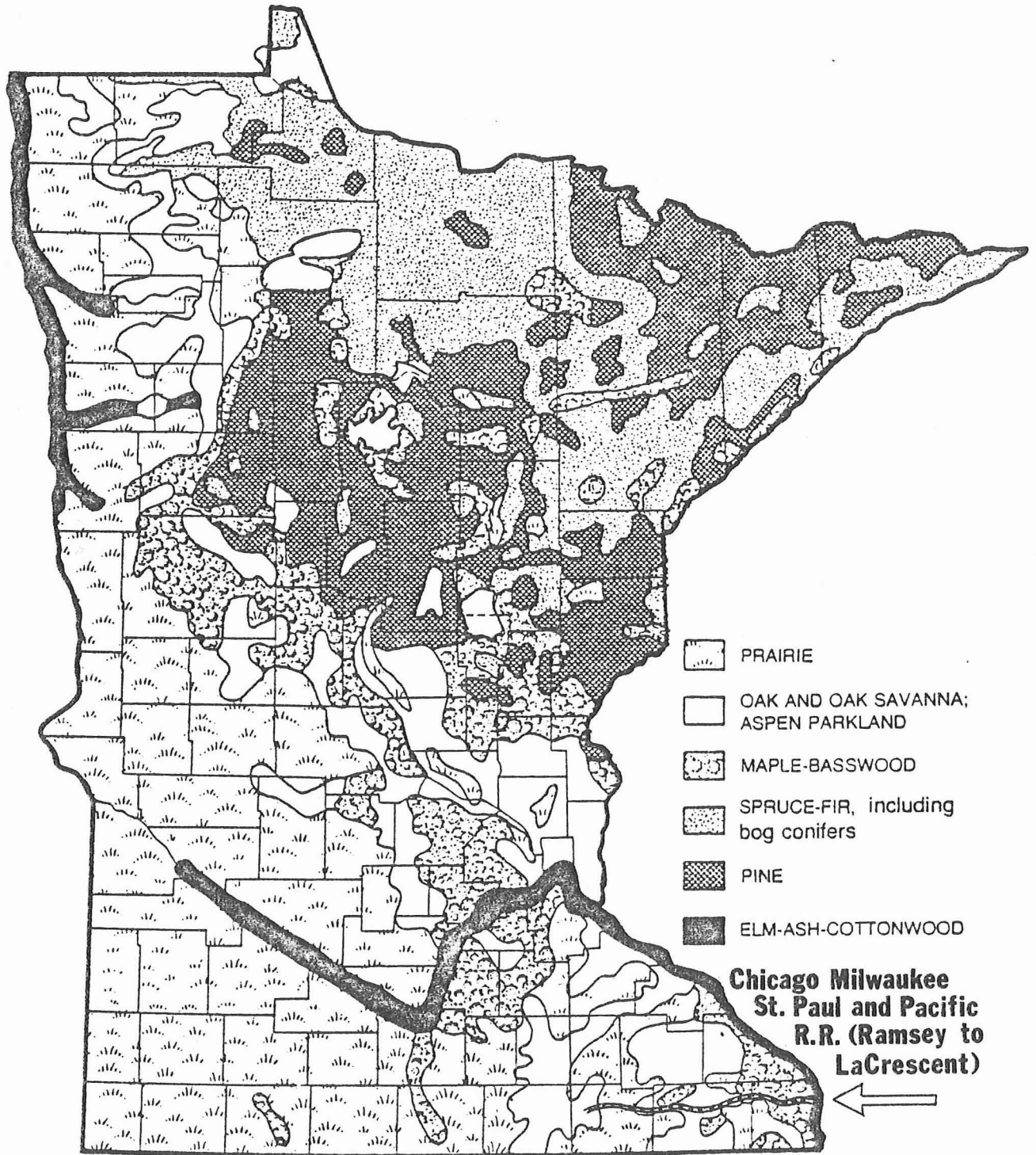
OAK ELM WALNUT: Along with maple-basswood, this type is considered part of the "Big Woods". The oak-elm-walnut forests are found on dry-mesic sites. Red Oak (Quercus rubrum), White Oak (Q. alba), Pin Oak (Q. ellipsoidalis) and American Elm (Ulmus americana) are typical members of this community. Black Walnut (Juglans nigra) Butternut (Juglans cinerea), Hackberry (Celtis occidentalis) and Red Cedar (Juniperus virginia) were also found in the oak-elm-walnut classification.

PRAIRIE: Prairies observed were of the tall-grass type (Hienselman). Fire is a major factor in preventing encroachment of brush and forest species and in maintaining the diversity and productivity of prairies. Most of the native prairie communities of southeastern Minnesota have been lost to intensive agriculture.

The prairies in the Fountain to La Crescent section were typically "goat prairies", most commonly on south-facing bluff slopes and invaded by Juniper (Juniperus communis).

RIVER BOTTOM FORESTS: Forests common along floodplain of the Root River and marsh areas, found on alluvial soils. Typical species include Box elder (Acer negundo), Silver Maple (Acer saccharinum), Cottonwood (Populus deltoides) and American Elm (Ulmus americana). The River Bottom Forests were often found to have been grazed in this survey.

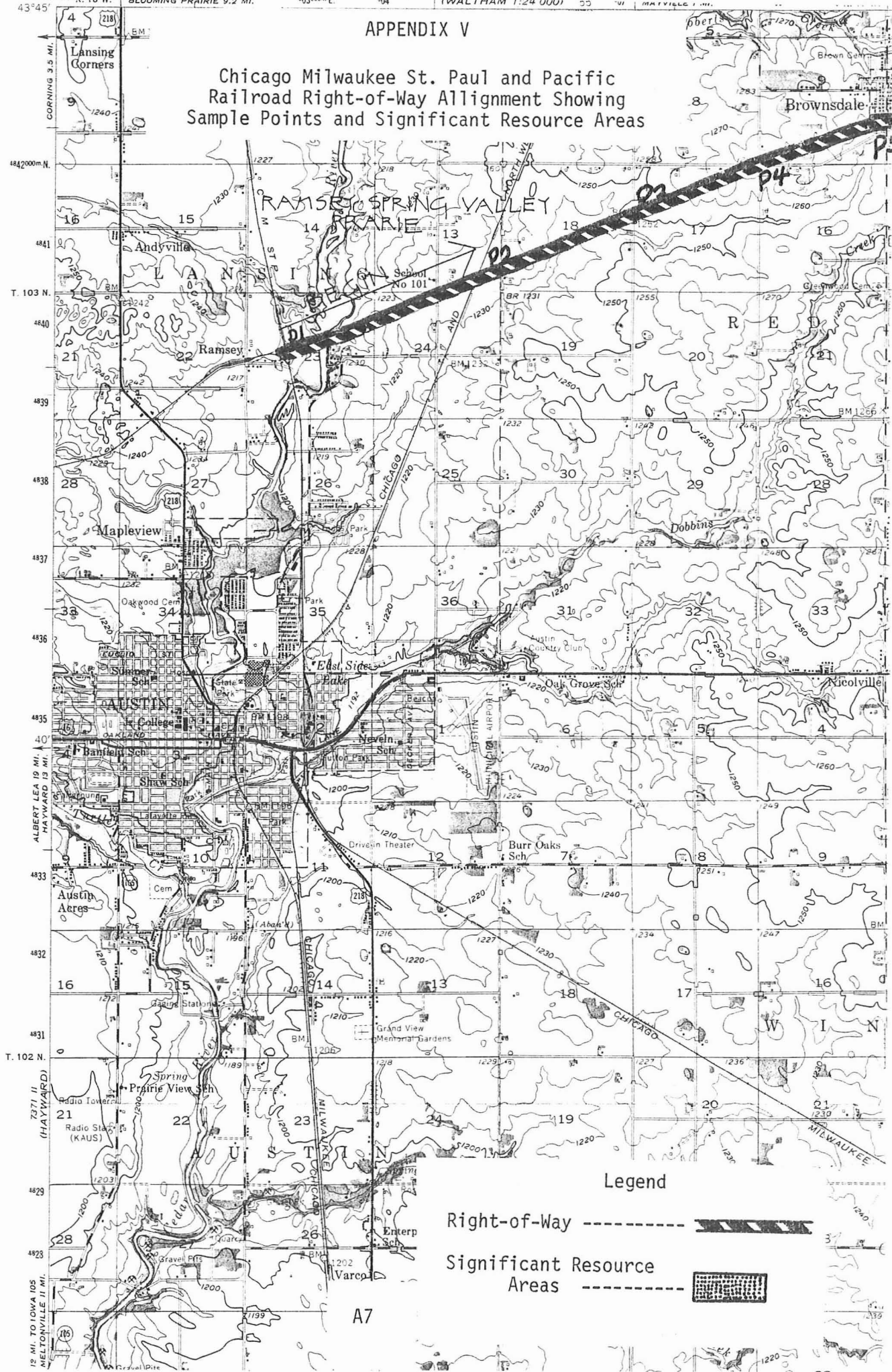
APPENDIX III



III. Presettlement vegetation types in Minnesota. (Adapted by Patricia Burwell from an unpublished map drawn by F. J. Marschner in 1930 for the United States Department of Agriculture, Washington, D.C.)

APPENDIX V

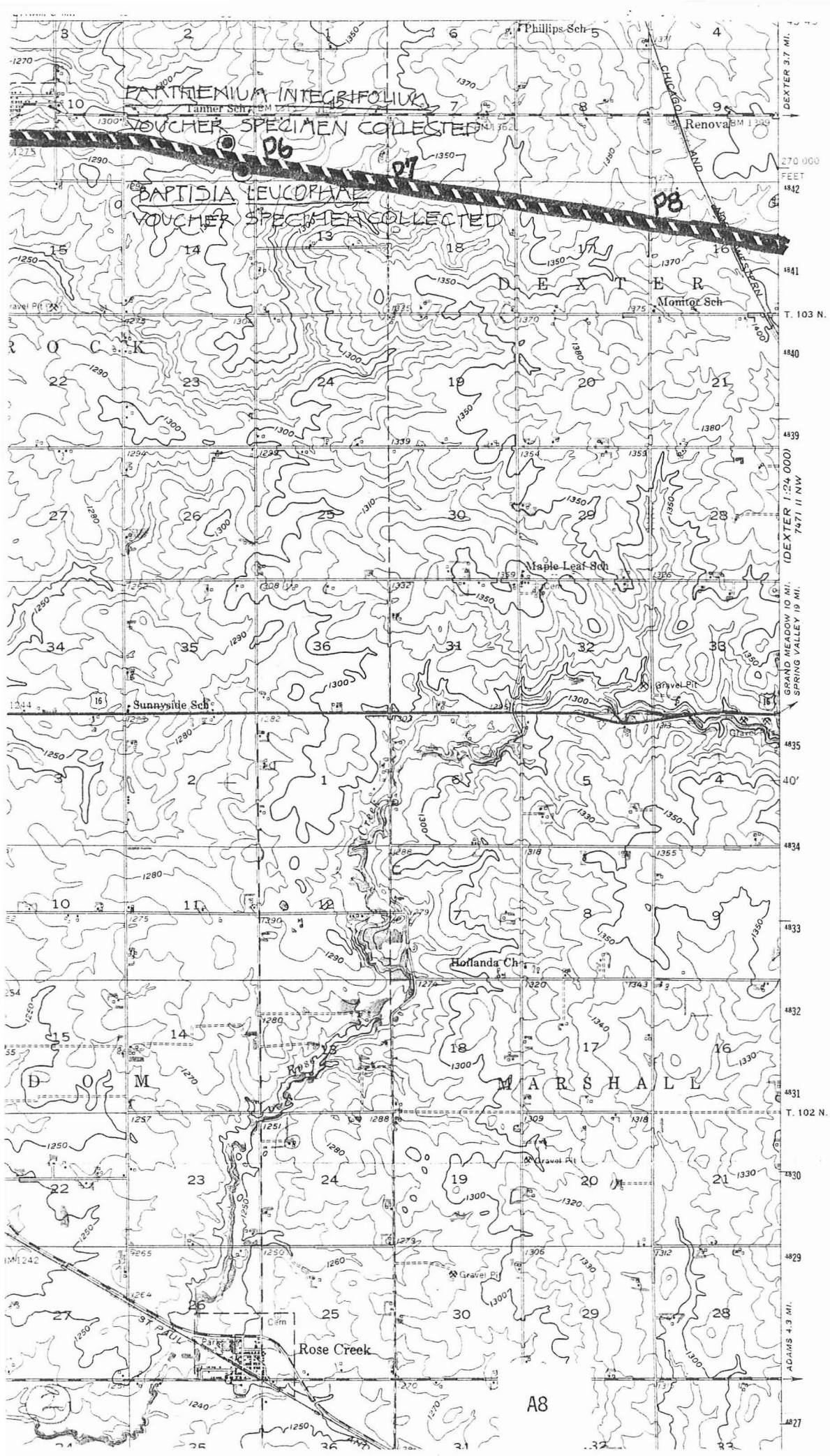
Chicago Milwaukee St. Paul and Pacific Railroad Right-of-Way Allignment Showing Sample Points and Significant Resource Areas



Legend

- Right-of-Way
- Significant Resource Areas

A7



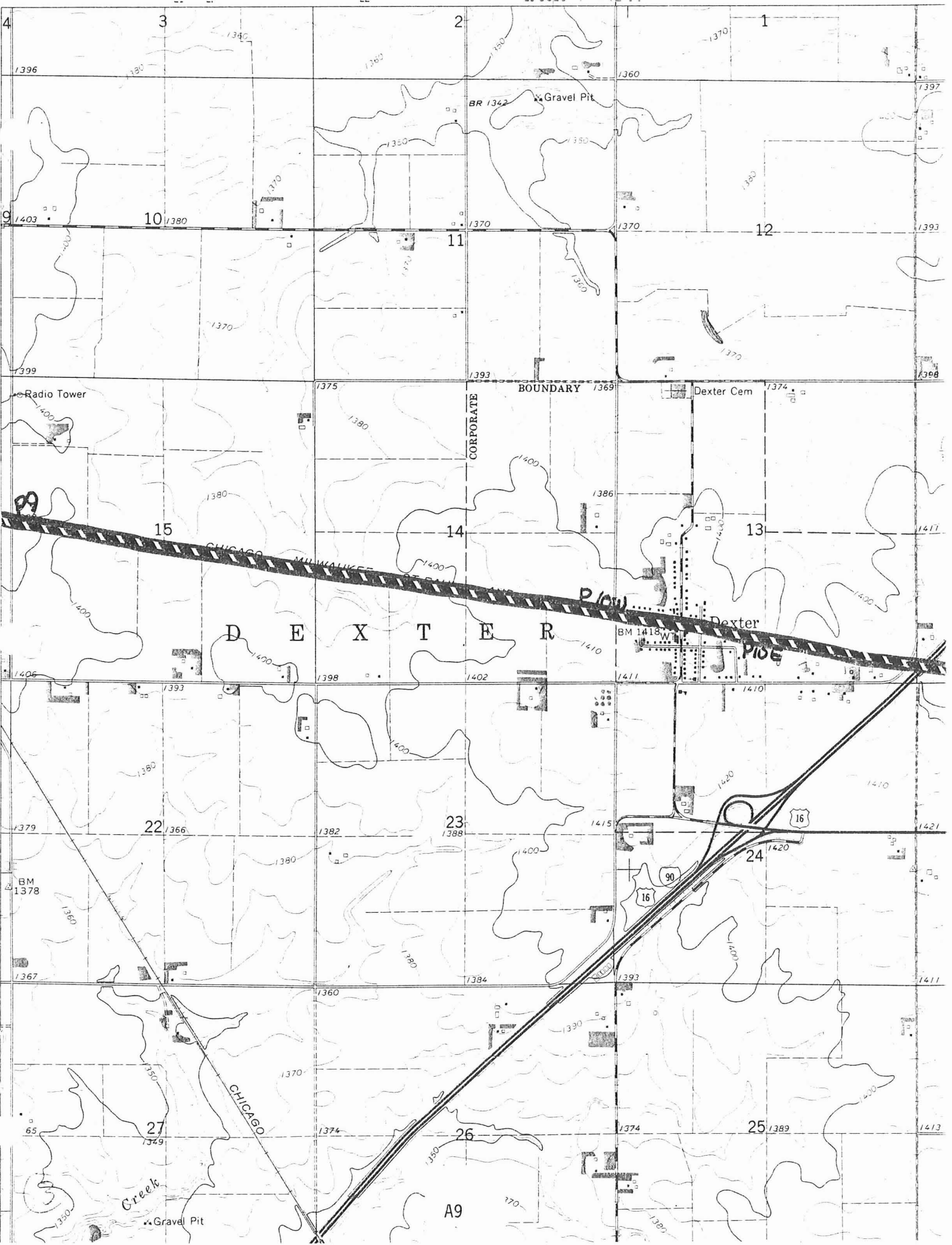
PARTIENIUM INTEGRIFOLIUM
VOUCHER SPECIMEN COLLECTED
P6

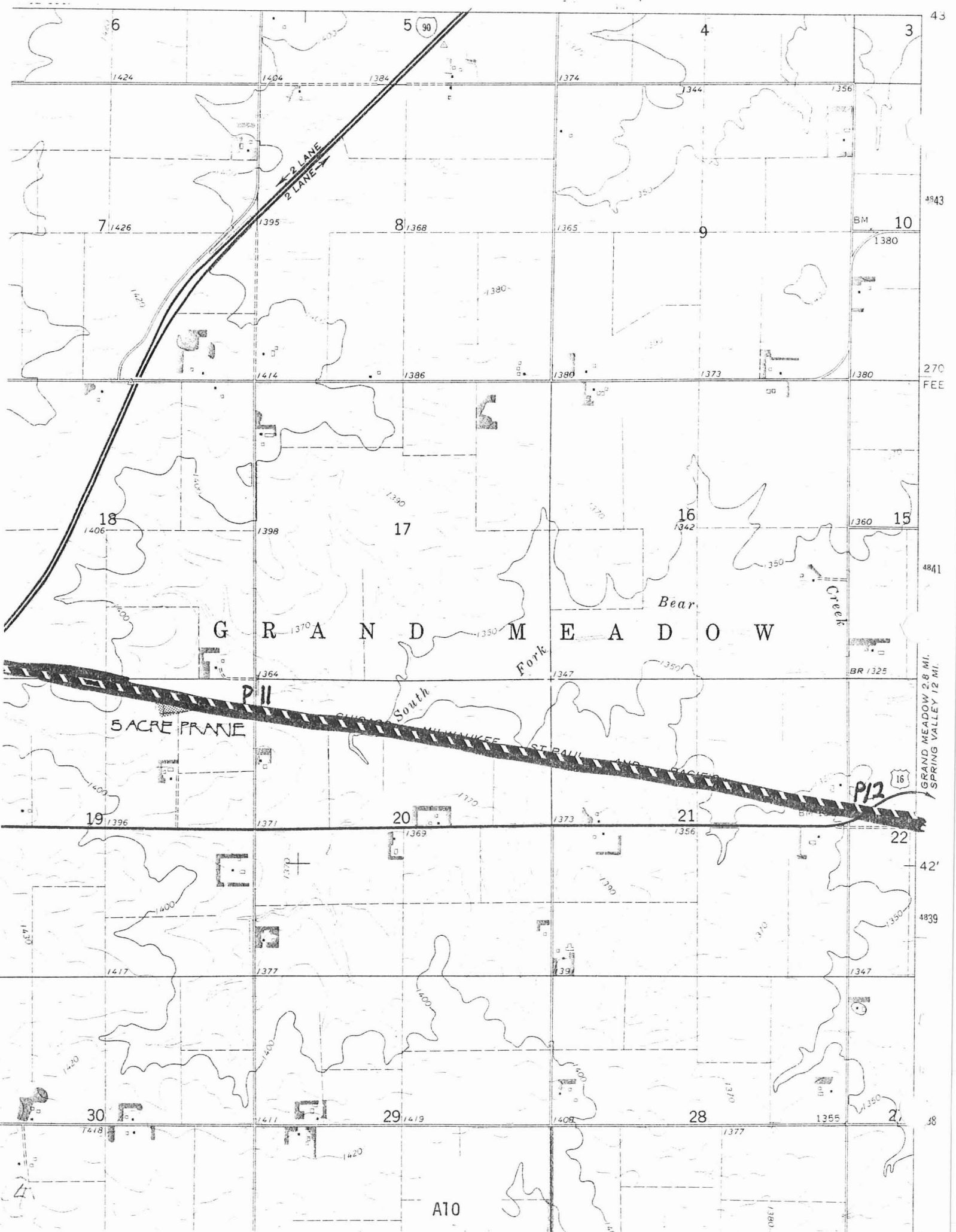
BAPTISIA LEUCOPHYLLA
VOUCHER SPECIMEN COLLECTED
P7

P8

A8

DEXTER 3.7 MI.
270 000
FEET
1842
1841
T. 103 N.
1840
4839
(DEXTER 1:24,000)
7471 II NW
GRAND MEADOW 10 MI.
SPRING VALLEY 19 MI.
4835
40'
4834
4833
4832
4831
T. 102 N.
4830
4829
4.3 MI.
ADAMS
4827





43

4943

270

FEE

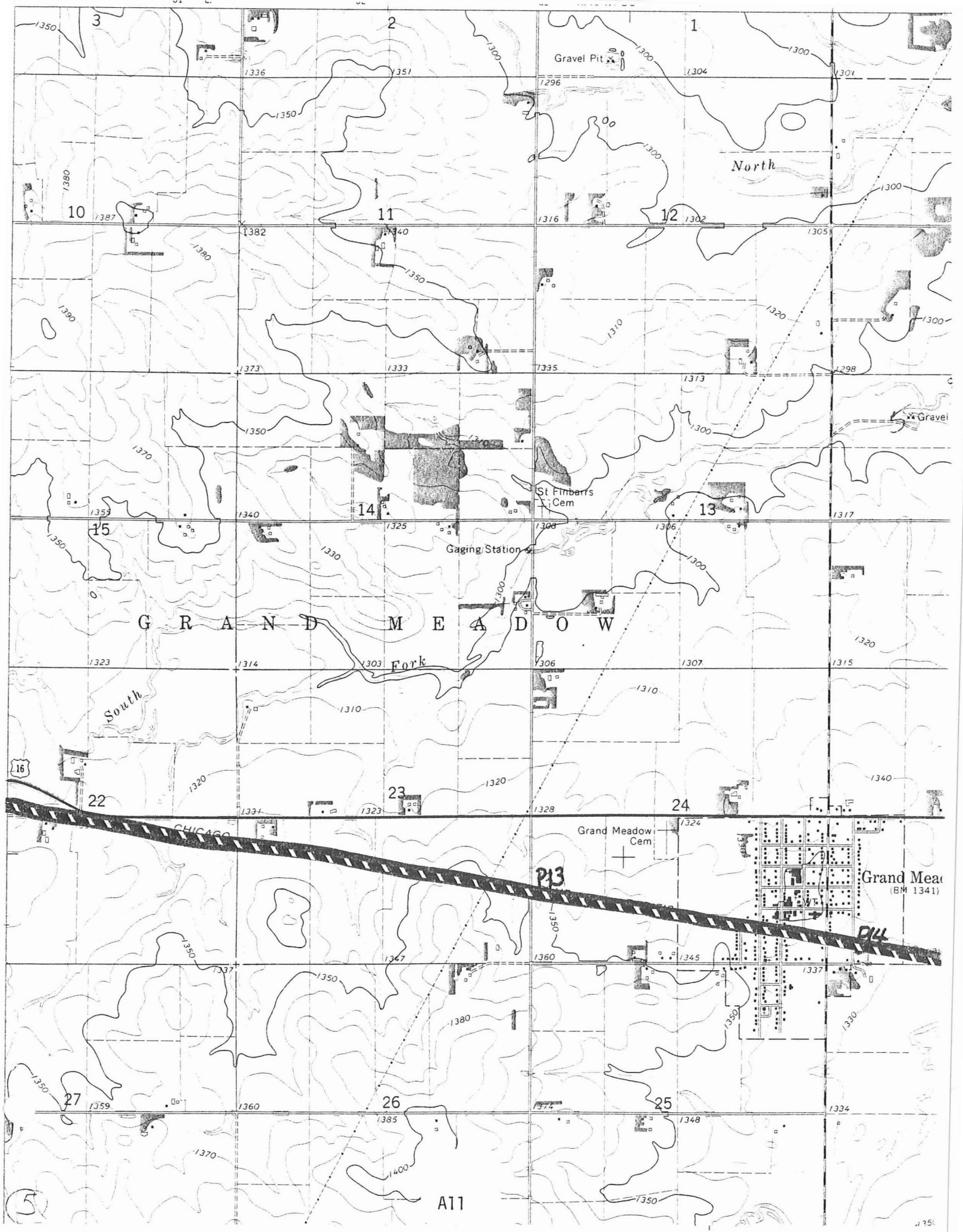
4841

42'

4839

38

A10



G R A N D M E A D O W

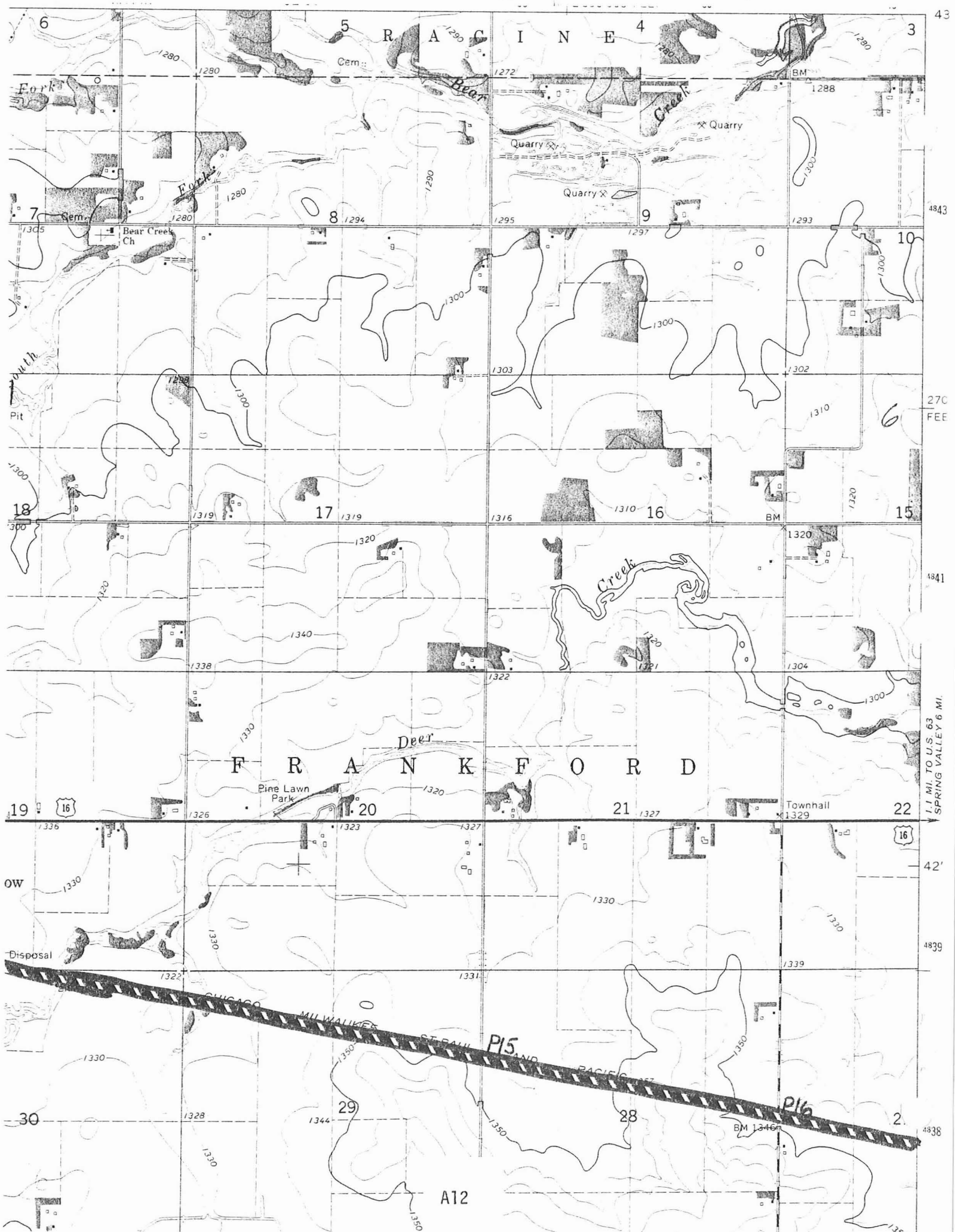
Fork

Grand Meadow Cem

Grand Mea
(EM 1341)

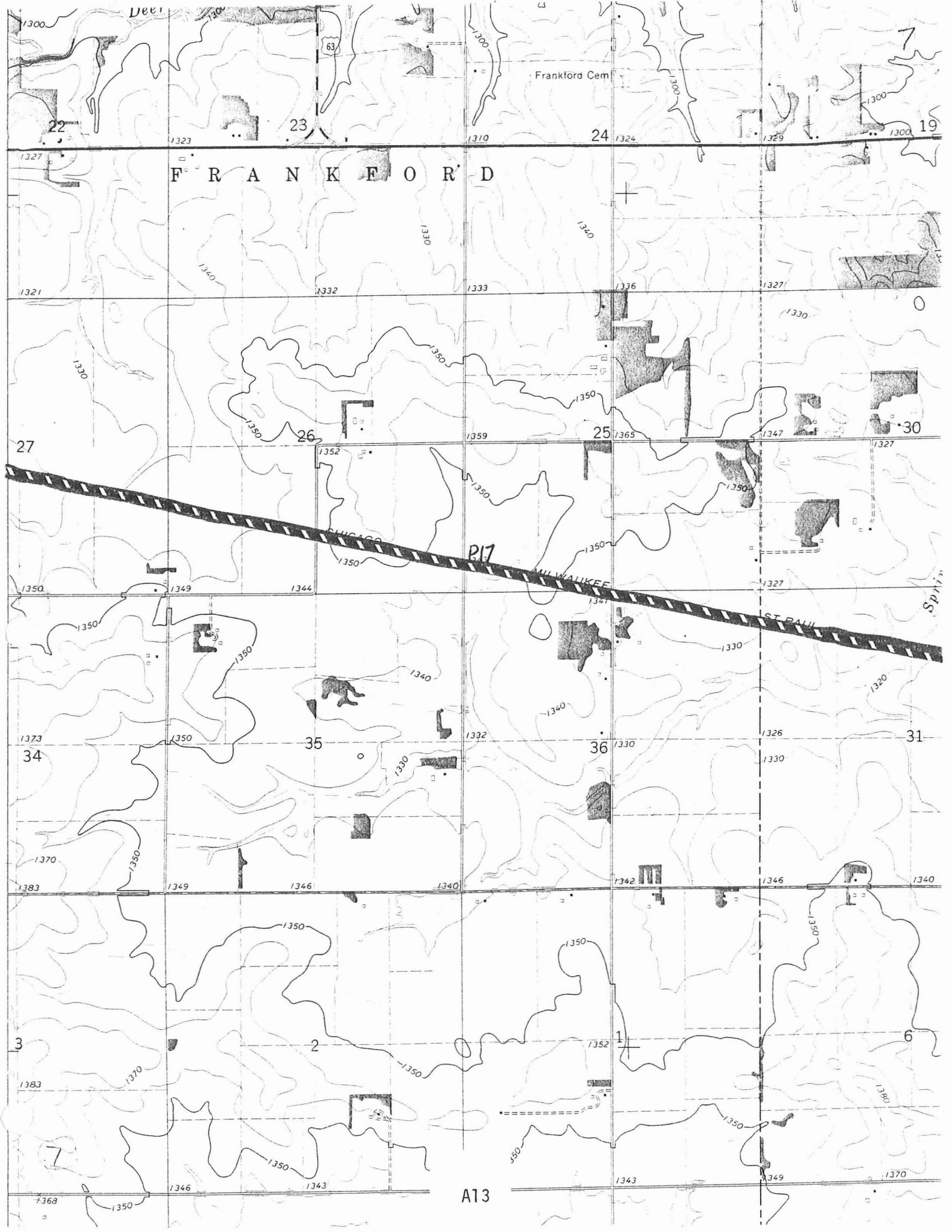
AT1

(5)



A12

1.1 MI. TO U.S. 63
SPRING VALLEY 6 MI.

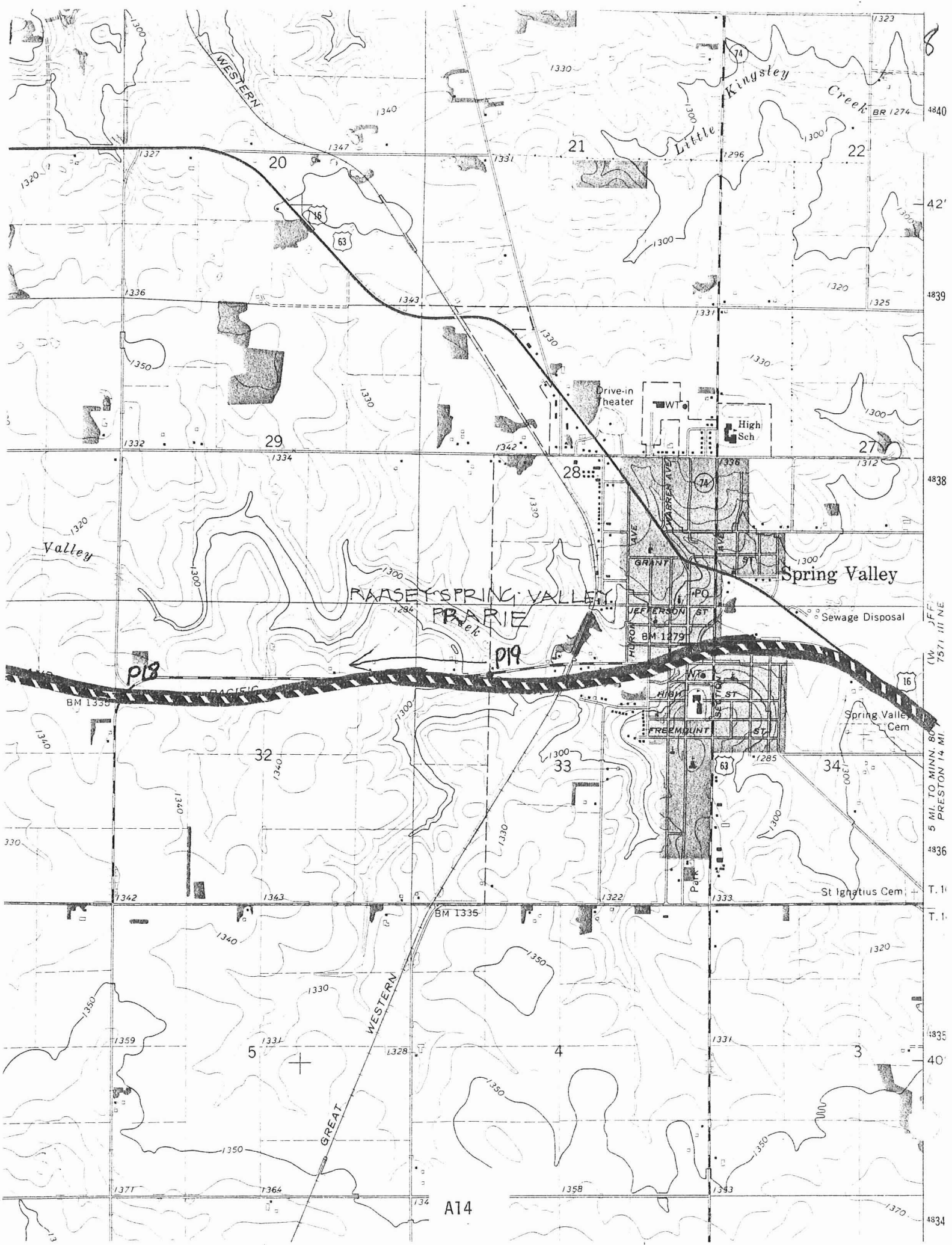


Frankford Cem

FRANKFORD

R17

A13



RAASEY SPRING VALLEY PRAIRIE

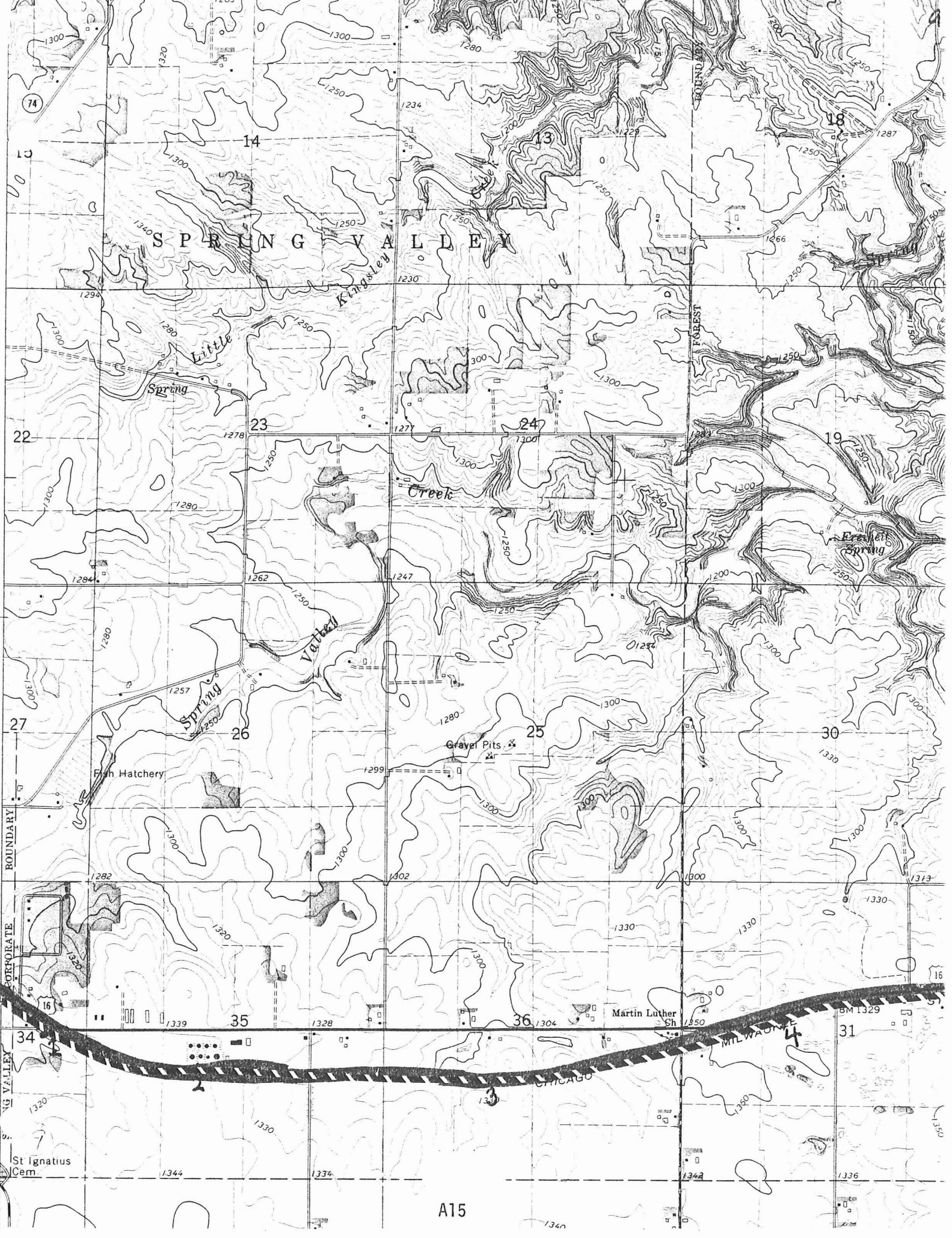
Spring Valley

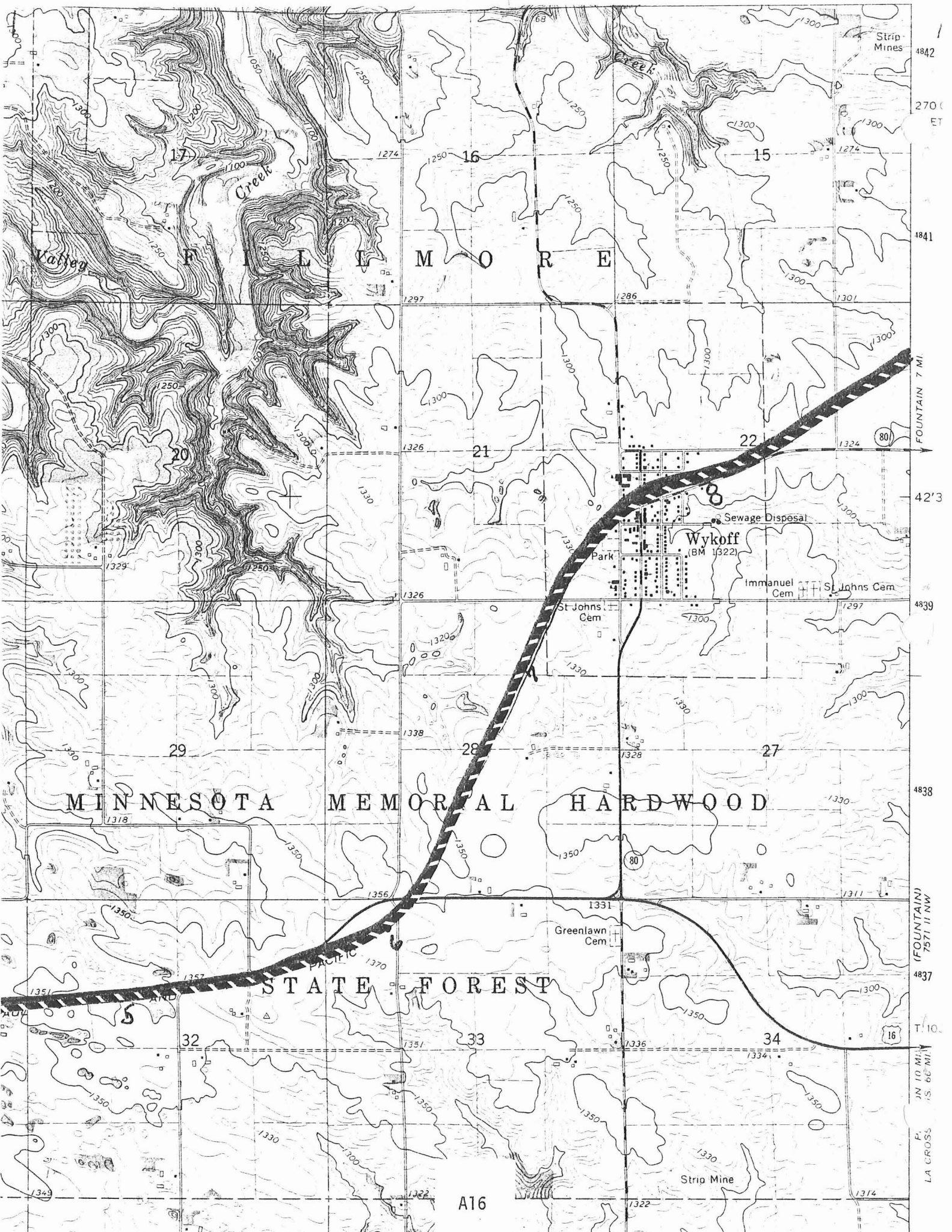
P18

P19

(W. J.F.F. 7571 III NE
5 MI. TO MINN. SO.
PRESTON 14 MI.

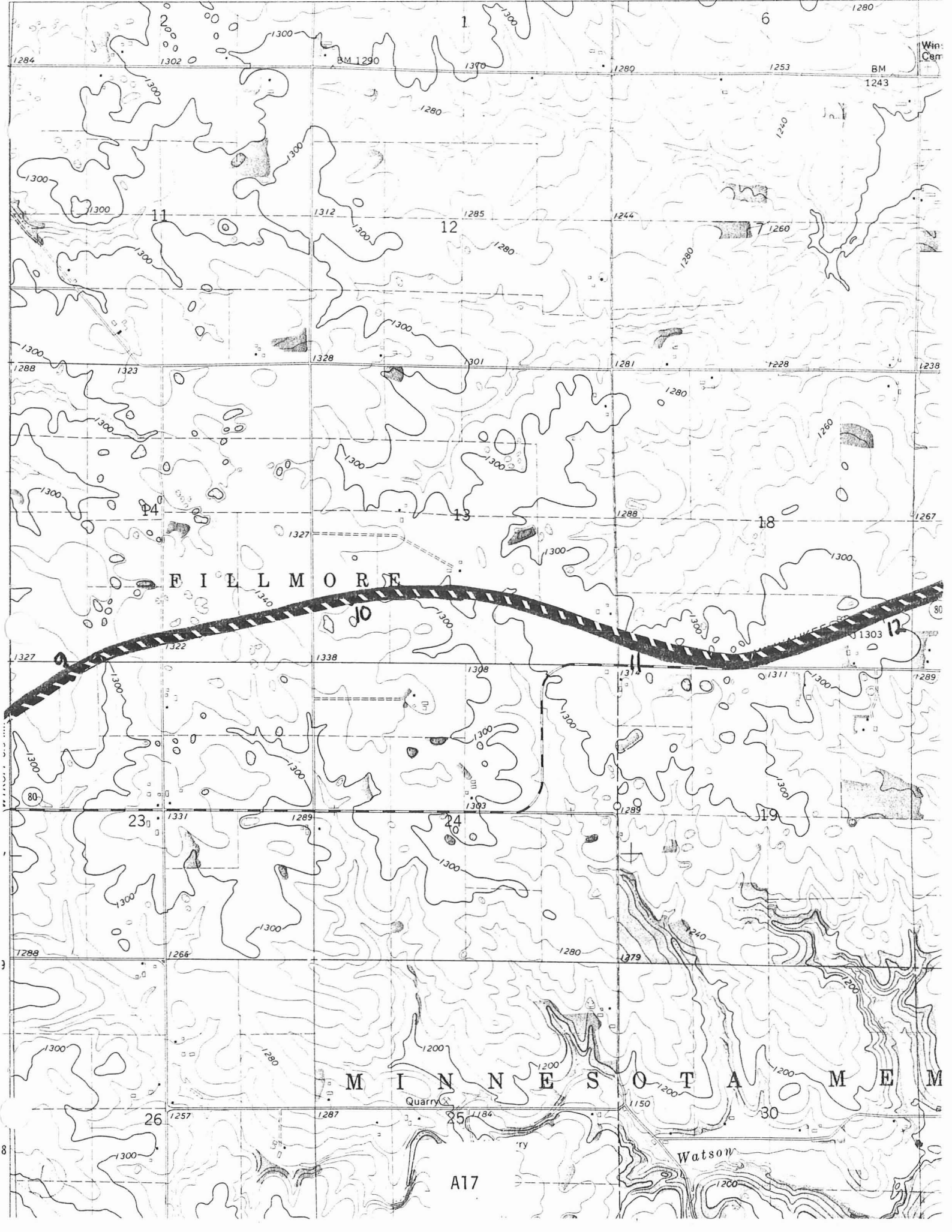
A14





4842
270
ET
1841
42'3
4839
4838
4837
T. 10
N. 10 MI.
S. 66 MI.
LA CROSS

A16



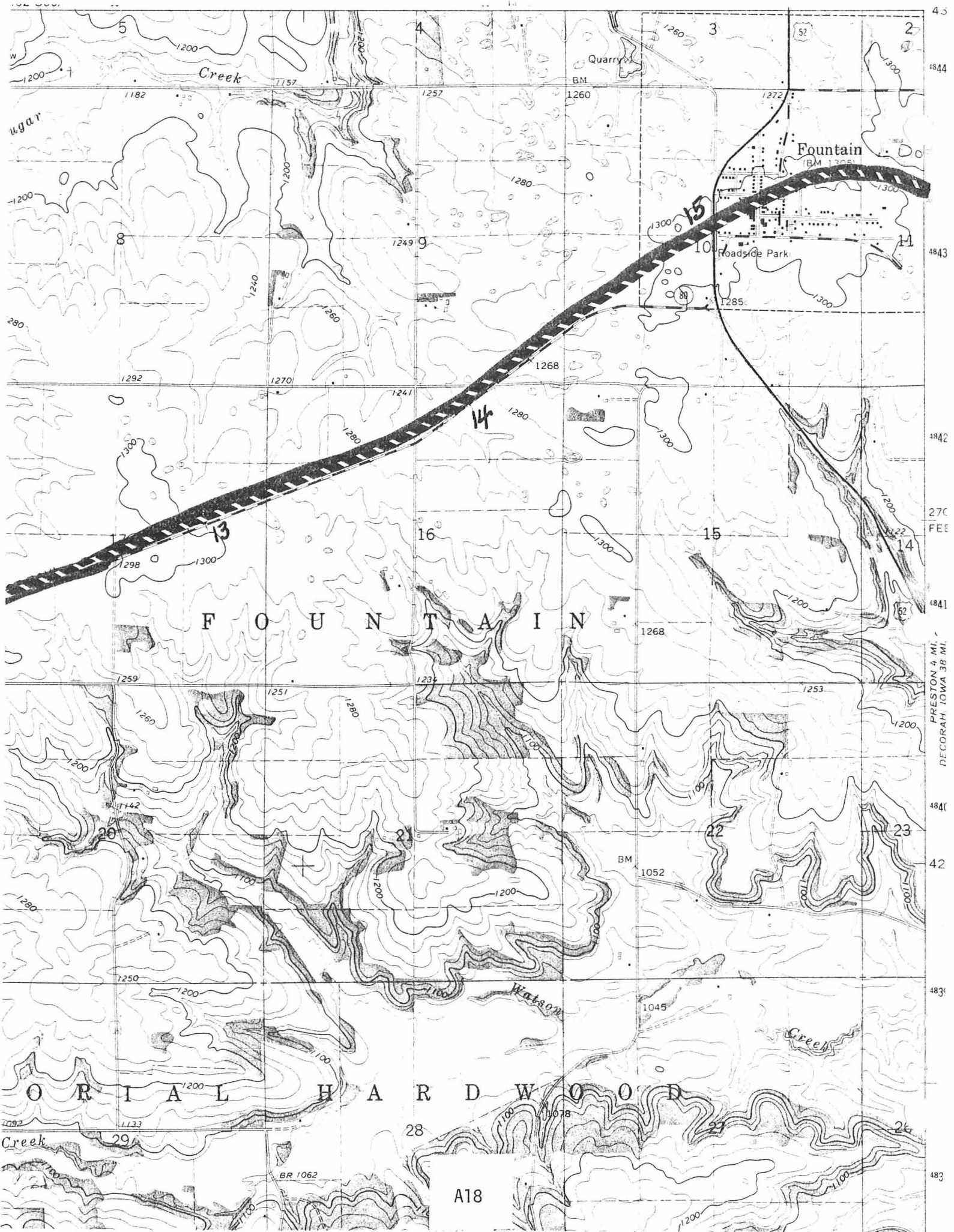
FILMORE

MINNESOTA

Watson

Quarry

A17

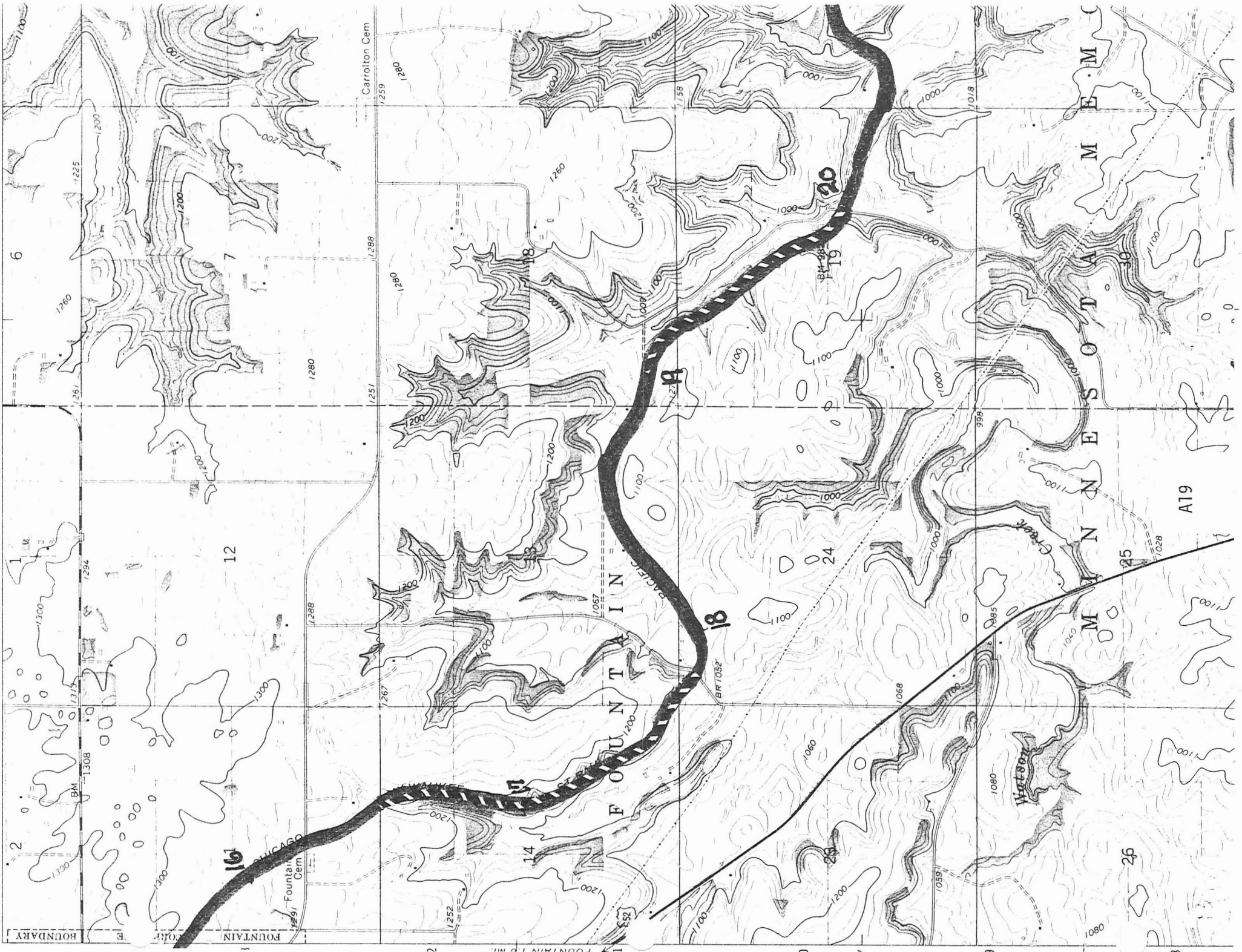


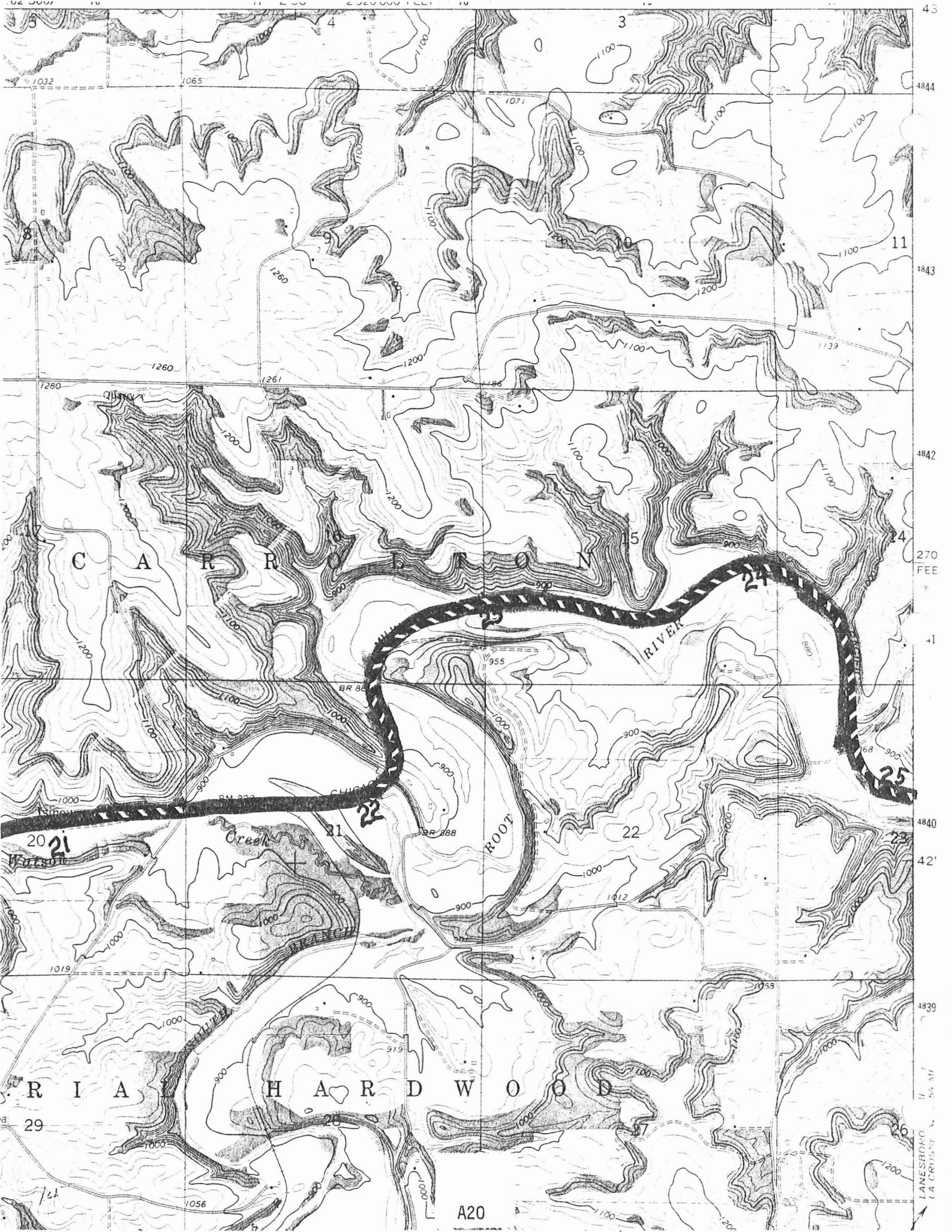
F O U N T A I N

O R I A L H A R D W O O D

PRESTON 4 MI.
DECORAH, IOWA 38 MI.

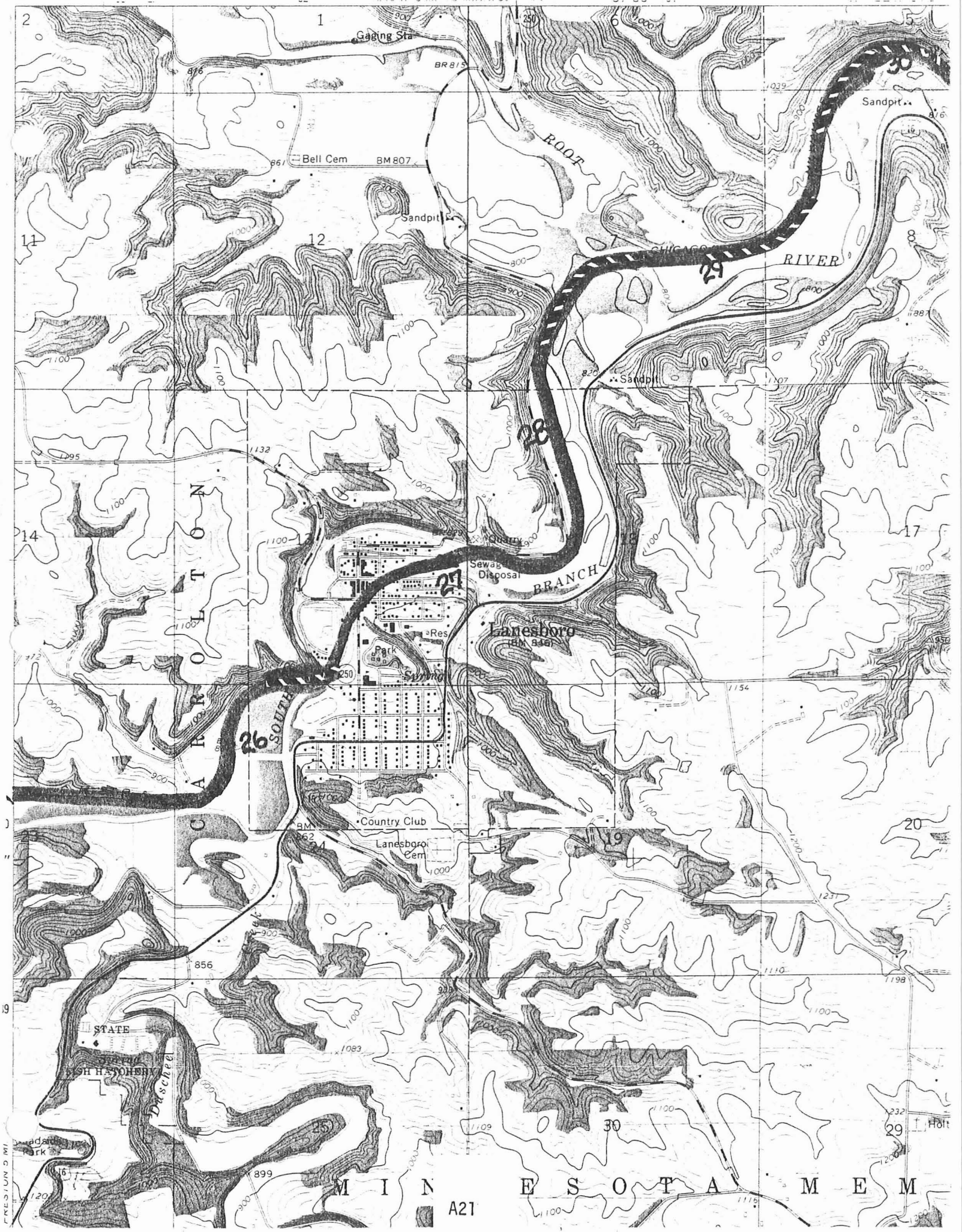
A18





43
4844
4843
4842
270
FEE
41
4840
42'
4839
5.0 MI
LANESBORO
LA CROSS

A20



Gaging Sta

Bell Cem BM 807

Sandpit

Sandpit

ROOT RIVER

RIVER

BRANCH

Lanesboro (RM 836)

Country Club

Lanesboro Cem

STATE

SH H. JOHNSON

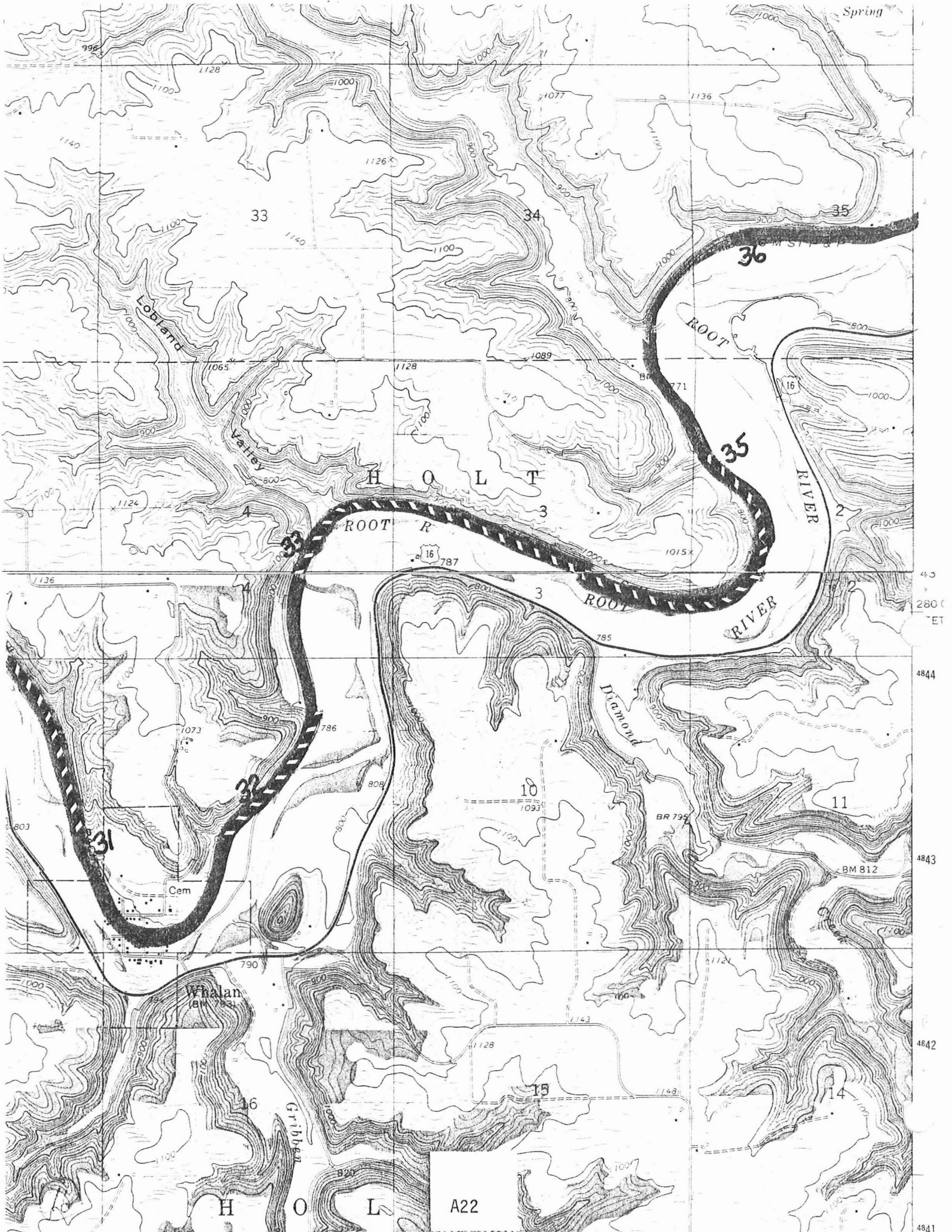
DuSacre

M I N

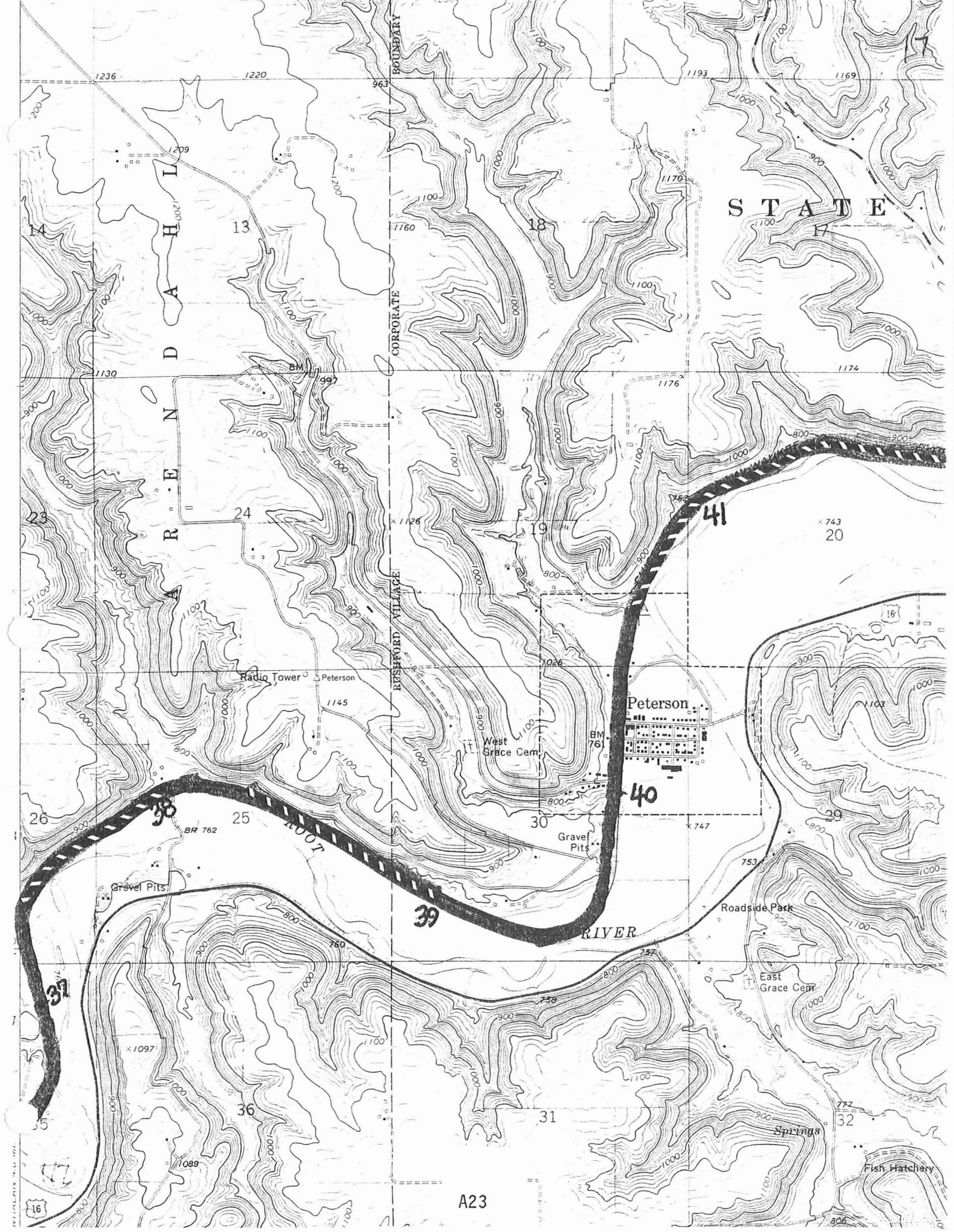
E S O T A M E M

A21

CRESTON 3 MI



45
280
ET
4844
4843
4842
4841



MINNESOTA

STATE

CORPORATE BOUNDARY

RUSHFORD VILLAGE

RIVER

A23

13
14
17
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Radio Tower
Peterson

Peterson

West Grace Cem

Gravel Pits

Roadside Park

East Grace Cem

Springs

Fish Hatchery

Gravel Pits

BR 762

BM 761

1097

1089

1145

1026

747

753

772

806

1130

997

1100

1160

1100

1170

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1174

743

16

16

1236

1220

963

1193

1169

1209

1207

1100

1100

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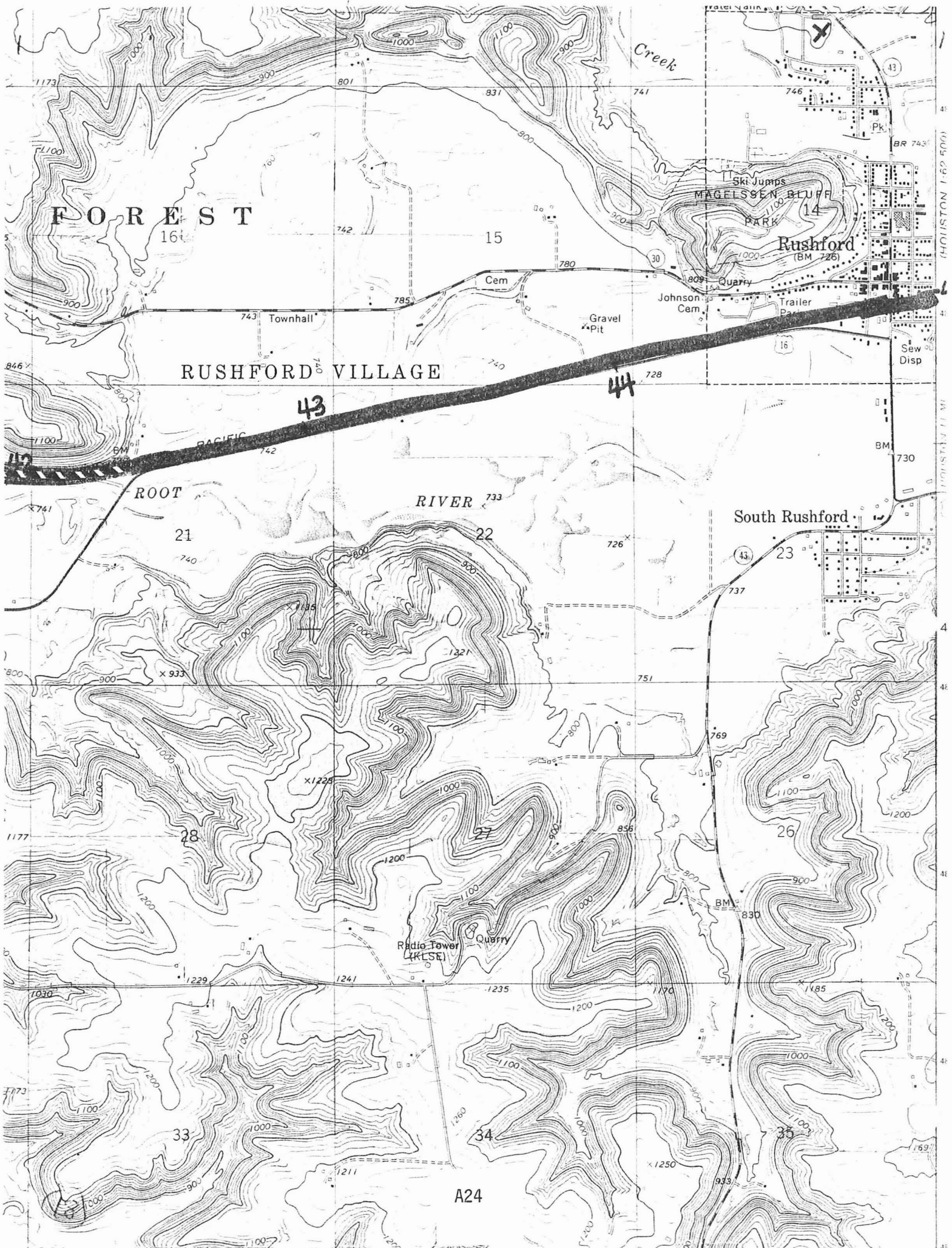
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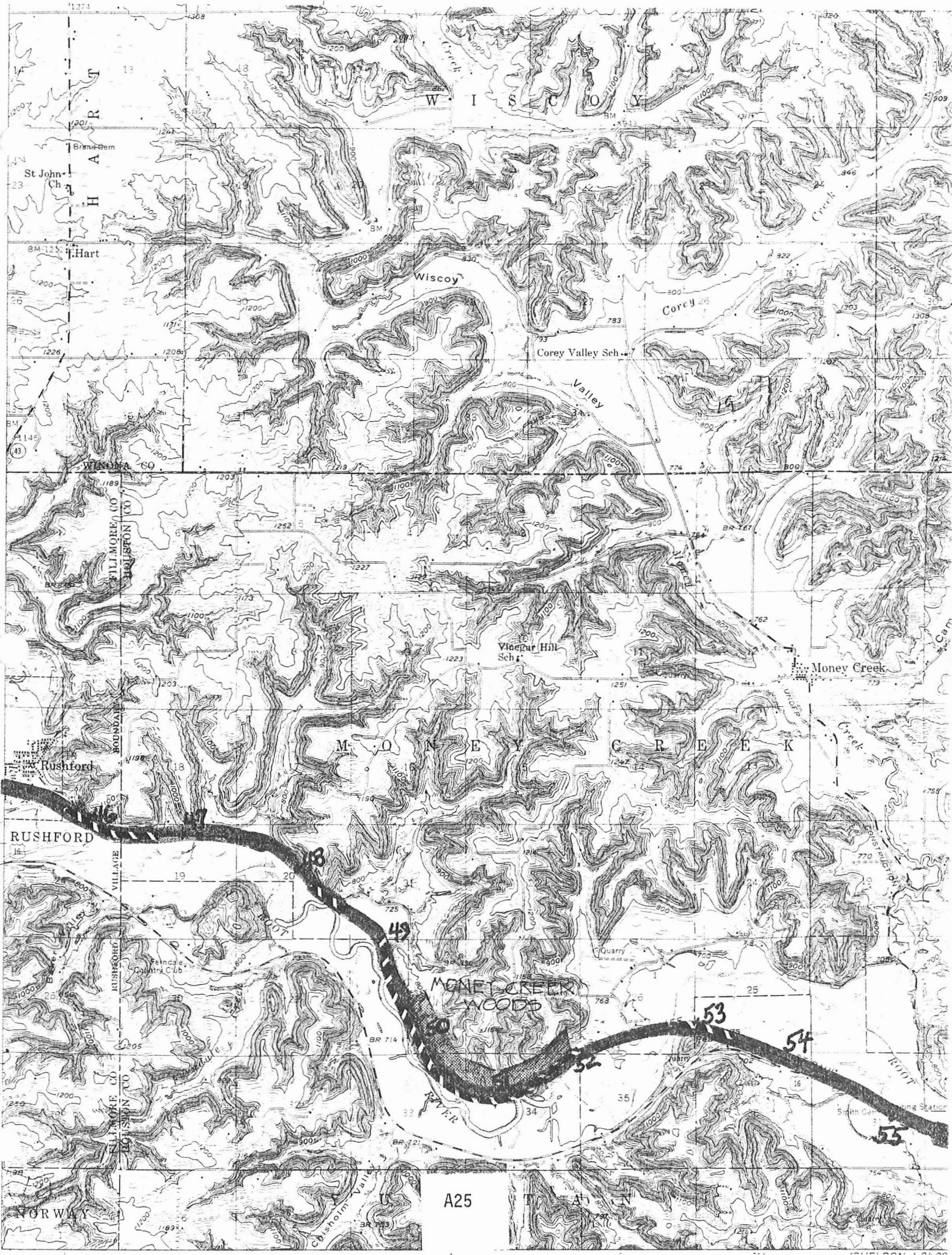
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1000

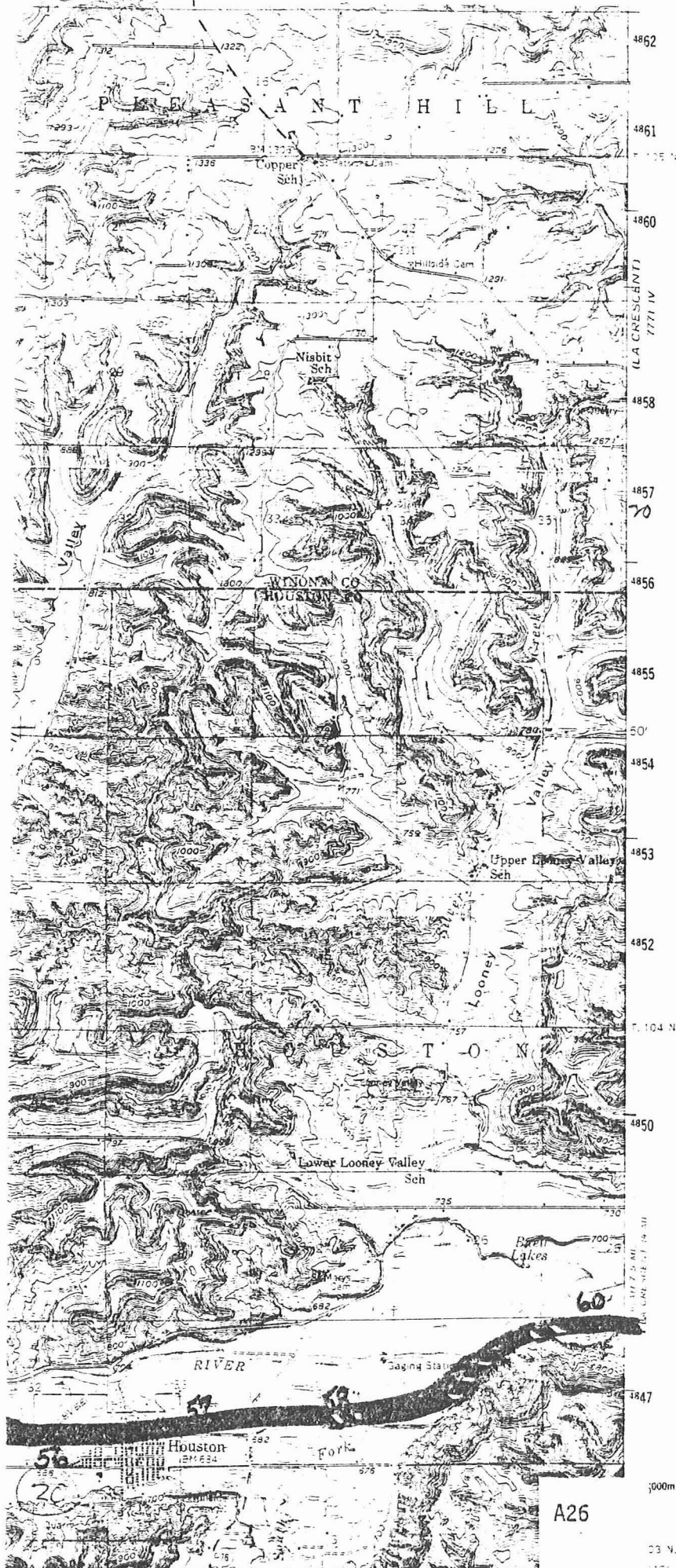
900

900





A25



A26

1:000m N.

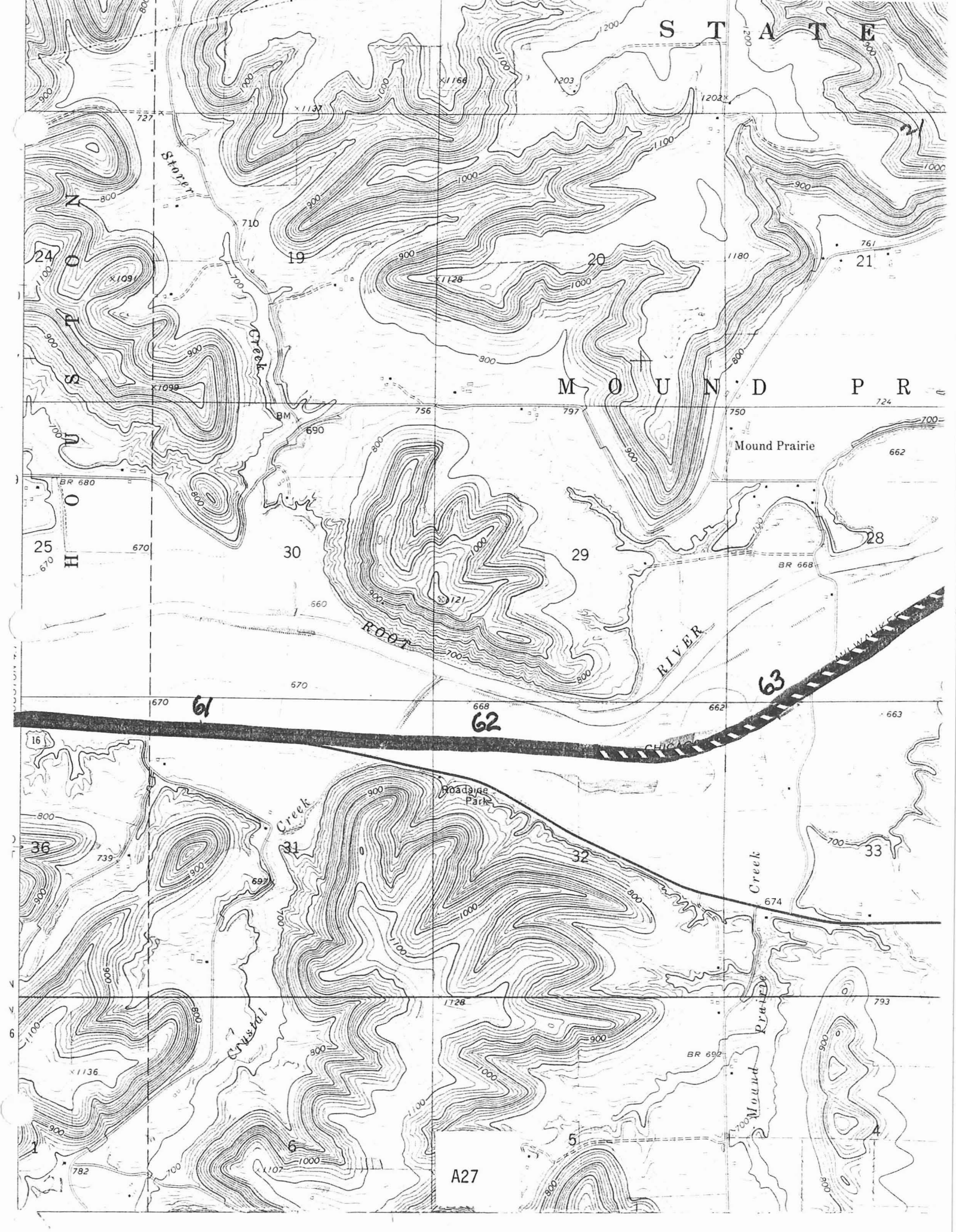
23 N.
15'

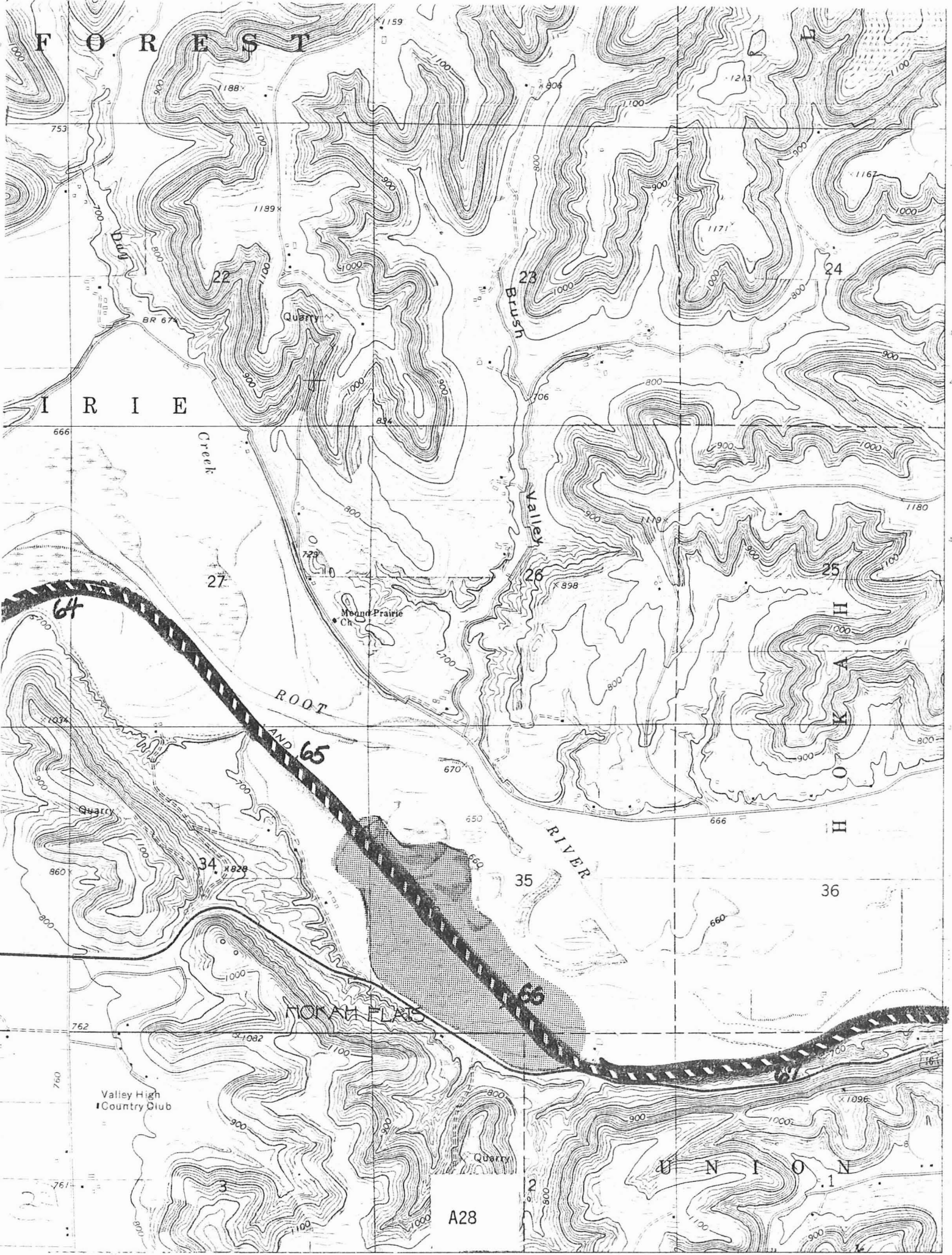
S T A T E

M O U N D P R

Mound Prairie

A27





F O R E S T

I R I E

ROOT

RIVER

NORMAL FLATS

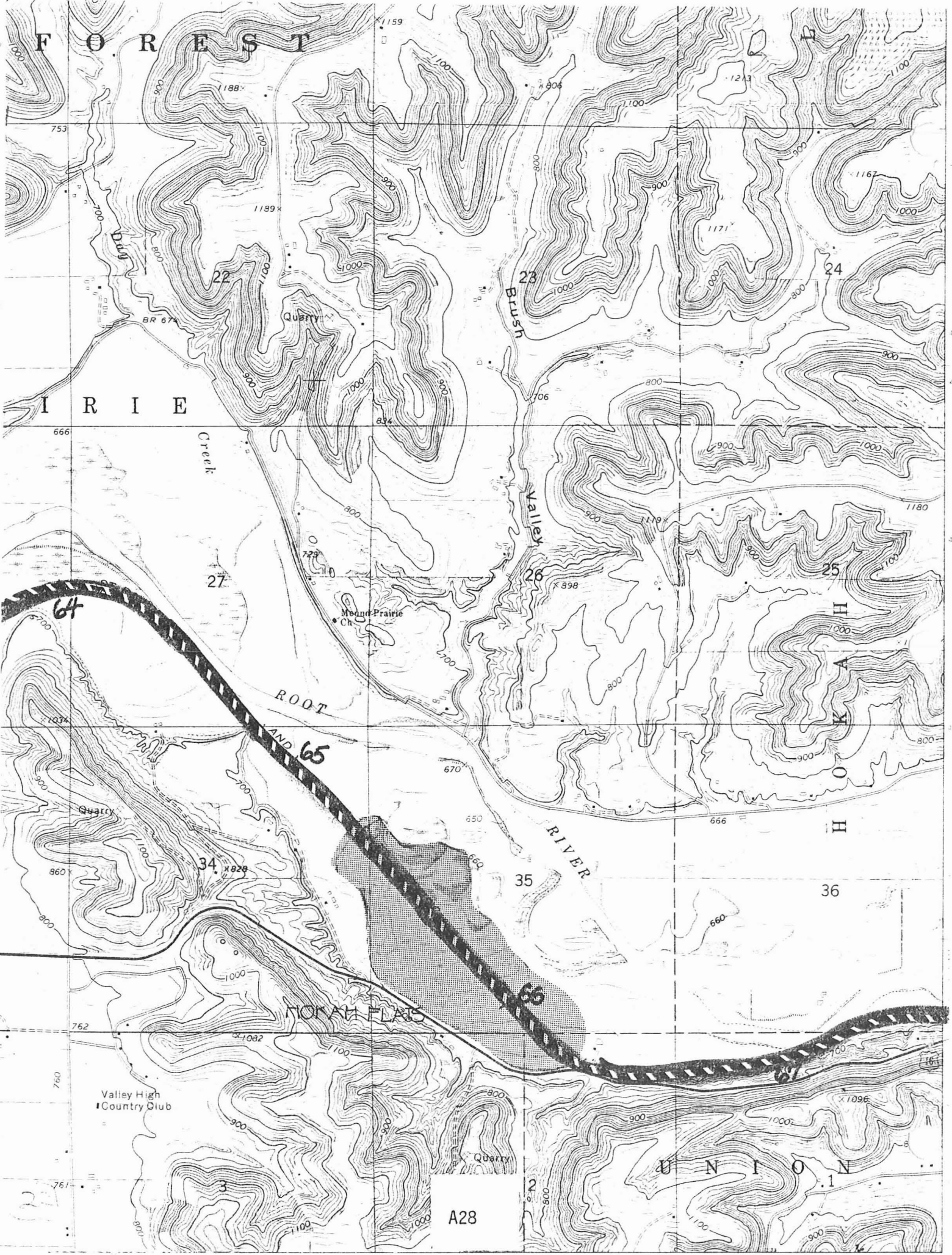
U N I O N

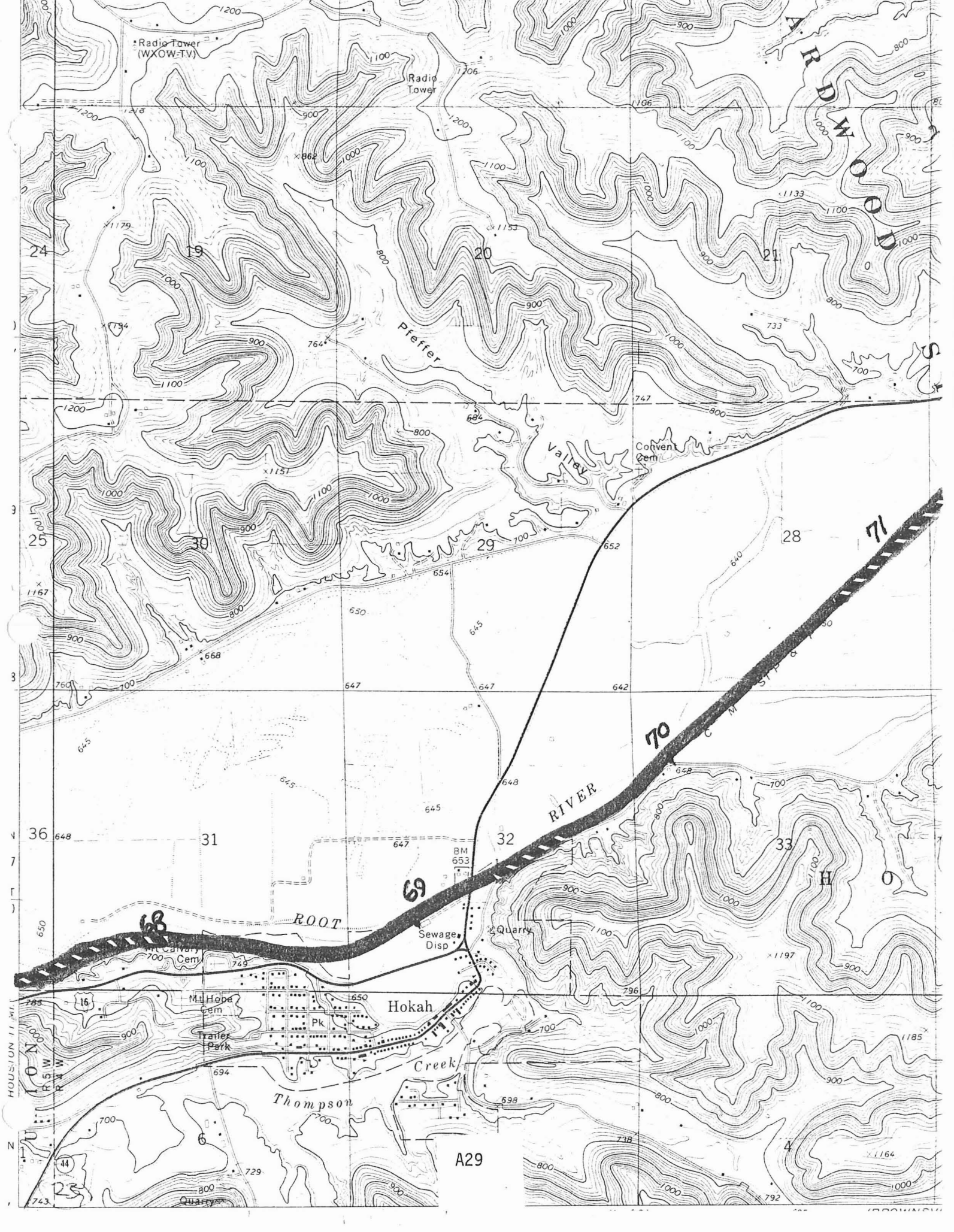
Valley High
Country Club

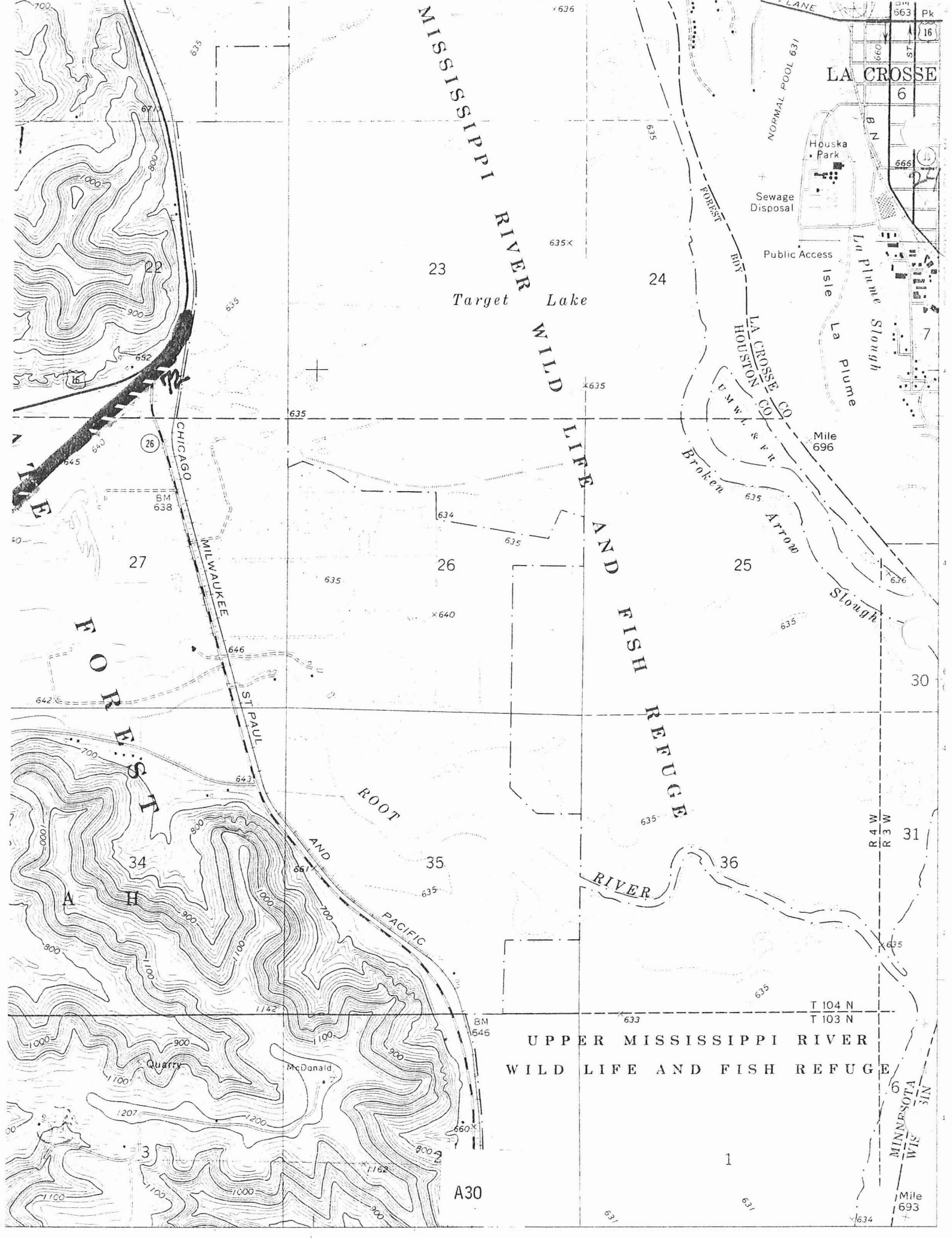
Quarry

Meadow Prairie
Ch.

A28







MISSISSIPPI RIVER

23 Target Lake 24

WILD LIFE AND FISH REFUGE

LA CROSSE

Houska Park

Sewage Disposal

Public Access

La Plume Slough

Mile 696

LA CROSSE CO

HOUSTON CO

Broken Arrow

25

30

FOREST

27

26

ROOT

35

AND

PACIFIC

RIVER

36

R 4 W

R 3 W

31

T 104 N

T 103 N

UPPER MISSISSIPPI RIVER WILD LIFE AND FISH REFUGE

MINNESOTA WIS 31N

Mile 693

A30

1