# ENVIRONMENTAL IMPACT ASSESSMENT

MICHIGAN AVENUE EXTENSION
STEVENS POINT
WISCONSIN

December 1974

John A. Strand & Associates, Inc.
Madison, Wisconsin

# ENVIRONMENTAL IMPACT ASSESSMENT

# MICHIGAN AVENUE EXTENSION

# STEVENS POINT, WISCONSIN


Prepared By:

John A. Strand and Associates, Inc.
Consulting Engineers
Madison, Wisconsin

With the Assistance of:

Mr. David Hillier, University of Wisconsin - Stevens Point
Biological

Mr. Donald Baxa, University of Wisconsin Extension, Madison
Ambient Sound

Mr. Robert Smith, University of Wisconsin Extension, Madison
Special Environmental Consultant

HYDRAULIC WORKS
MUNICIPAL ENGINEERING
STRUCTURAL ENGINEERING
WATER AND SEWERAGE WORKS
PUBLIC AND INDUSTRIAL BUILDING

**JOHN A. STRAND & ASSOCIATES, INC.**
PROFESSIONAL CONSULTING ENGINEERS
TELEPHONE 238-3451
2020 UNIVERSITY AVENUE
MADISON, WISCONSIN 53705

MEMBERS
AMERICAN SOCIETY OF CIVIL ENGINEERS
AMERICAN WATER WORKS ASSOCIATION
FEDERATION OF SEWAGE AND INDUSTRIAL WASTES ASSOCIATIONS
AMERICAN CONCRETE INSTITUTE

December 9, 1974

City of Stevens Point
City-County Building
1515 Strongs Avenue
Stevens Point, Wisconsin 54481

Attention: Mr. Timothy Gremmer, P.E.
City Engineer

Gentlemen:

In accordance with your letter of August 21, 1974, we have completed our assessment of the environmental impact of the Michigan Avenue extension. The results of the environmental impact assessment are presented in the attached report.

We want to express our appreciation to City staff and officials, the Portage County Areawide Planning Office, and the staff of the University of Wisconsin-Stevens Point who provided information and comments during the preparation of this report.

We expect to receive comments or discuss the report at any informational hearings which might be held.

Very truly yours,

JOHN A. STRAND & ASSOCIATES, INC.

Rodney H. Hassett, P.E.

Donald J. Kratcha

Donald J. Kratcha, P.E.

RHH/DJK:cp

Enclosures

TABLE OF CONTENTS

## LIST OF FIGURES



## LIST OF TABLES



## LIST OF APPENDICES

# SUMMARY

## Project Description

This report concerns the proposed extension of Michigan Avenue in Stevens Point from its present northern terminus at Maria Drive in order to complete a north-south artery. This route is required to provide for future traffic growth and will complete a portion of the City's Official Street Plan. A number of alternate corridors were considered and one was selected as the recommended route. This report analyzes its impact on the community and on adjacent lands.

The recommended route passes through lands owned by the State of Wisconsin and the Sentry Insurance Company, and are undeveloped, consisting of mixed woodlands and wetlands with some open meadows. In conjunction with the proposed corridor, and upon completion of the new street, the existing part of Reserve Street between Maria Drive and North Point Drive will be vacated. The street will be removed and a hiking and bicycle trail and landscaping will be provided instead of the existing street.

Reserve Street now passes through the campus of the University of Wisconsin - Stevens Point which is a hazardous situation. Increased traffic flow along Reserve Street will increase the potential of vehicle-pedestrian conflicts. The proposed new route is intended to discourage vehicles from using Reserve Street by giving them a better alternate route, therefore increasing safety in the campus area.

## Probable Impact on the Environment

The proposed new route will affect plant and animal habitat by removing some existing trees and wetlands. Most of the alternates considered will similarly affect the area, but the recommended route will provide the best compromise biologically while accomplishing the pedestrian safety and future traffic movement objectives. A large traffic increase will occur in this area. This increase in traffic will have an effect on the surrounding area, regardless of which of the alternate routes the traffic uses. The route recommended will have less effect than the other alternates. The proposed route will provide scenic vistas and will be aesthetically pleasing.

The degradation of air and water quality will be minimal. Drainage patterns will be maintained by culverts where necessary. Some plant life will be removed and some animal habitats will be changed. The area disturbed is only a small portion of the total area in the vicinity of the project, thus considerable animal habitat remains and other woodlands and wetlands will continue to exist.

The vacation of Reserve Street will allow existing woodlands and wetlands on each side of it to become joined ultimately, and may thus enhance wildlife habitat in that area.

## Unavoidable Adverse Effects on the Environment

The major unavoidable adverse effect is the removal of some woodland and wetland.

Some animal habitat may be lost or disturbed. For most animals the effect will be minimal because they have sufficient similar adjacent land to move into. Noise will increase during and after construction. Some air pollution occurs from the vehicles using the route but the effect will be less than from some of the alternatives. A small amount of salt pollution may occur, but this effect is minimized by the type of construction of the proposed route.

Economic Effects

Increased pedestrian safety in the UW-SP campus will occur because traffic will have a more desirable route and will thus be less inclined to use Reserve Street through the campus. Reduced time loss and less fuel consumption will occur for motorists because of reduced congestion and smoother traffic flow.

Increased tax base for Stevens Point because of possible increased development in the northern part of the City could be a long term economic benefit. Construction of the proposed street will provide temporary increased employment in the area. Funds estimated at $550,000 will be required to build the proposed street.

Alternates Considered

1. Maintain existing conditions - this is unsupportable because the existing streets will not handle the expected traffic. Safety would diminish.
2. Alternate Routes through University land - Several variations of the proposed route were considered. The alternate routes were less desirable than the proposed route based on the criteria considered.

3. Improve Reserve Street and Maria Drive - Using the existing streets but upgrading and widening them would destroy a large number of mature hardwoods and pines, and would not help pedestrian safety in the campus area.
4. Close Reserve Street and force use of Division Street - this alternate is unsupportable because Division Street is at capacity and the expected traffic increase would cause unacceptable delays in traffic movement.
5. Extend Minnesota Avenue to the north - this is not feasible because the proposed campus lake project precludes the extension, and the construction would be longer and more expensive.
6. Construct an interchange at Reserve Street - U.S.H. 51 Bypass - this is not realistic because this interchange would not serve to connect primary residential areas with the new development in the northern portion of the City.
7. Use Mass Transportation - this alternate would require a change in community attitudes, and would have to be government subsidized.

## Agencies Receiving Copies of this Report

The following agencies or individual have been sent copies of this Environmental Impact Assessment:

Stevens Point Library - available for general public

Stevens Point City Clerk's Office - available for general public

Stevens Point Mayor

All Stevens Point Aldermen

Stevens Point Comptroller - Treasurer

Stevens Point City Engineer

Stevens Point Water and Sewer Department

Stevens Point Chamber of Commerce

Portage County Areawide Planning Committee

Wisconsin Public Service Company - Stevens Point

Wisconsin Telephone Company - Stevens Point

State Senator - William Bablitch

State Assemblyman - Leonard Groshek

University of Wisconsin-Stevens Point - Chancellor's Office

UWSP - Planning Office

UWSP - Student Council

UWSP - Environmental Council

UWSP - Learning Research Center - available for general public

UW Central Administration - Madison

State Historical Society

Department of Natural Resources

Department of Local Affairs Development

Department of Administration

Department of Agriculture

Department of Health & Social Services

Department of Military Affairs

Department of Transportation

Public Service Commission

Governor

# I. DESCRIPTION OF PROPOSED IMPROVEMENT AND ITS SURROUNDINGS

## A. General

The proposed action is the construction of a street improvement extending Michigan Avenue from its present northerly terminus at Maria Drive to the north and slightly west, meeting Reserve Street at a point approximately 600 feet north of North Point Drive. The portion of the street on new location involves a right-of-way 66 feet wide and approximately 3,500 feet long. The project is sponsored by the City of Stevens Point and is proposed as part of the City's arterial street system. The street improvement is to be designed and built using local funding.

In addition to the construction of the proposed new street, the existing portion of Reserve Street between Maria Drive and North Point Drive is to be vacated. The vacated portion will be used as a bicycle and hiking path. The existing pavement will be removed, and only easements for utility lines will be retained. This report was prepared to comply with the Wisconsin Environmental Policy Act, and will discuss the environmental impacts of the recommended route, and point out the various alternates that were considered.

## B. Project Location

The project location is in the north central area of the City of Stevens Point, more specifically in the southwest 1/4 of Section 21, and the northwest

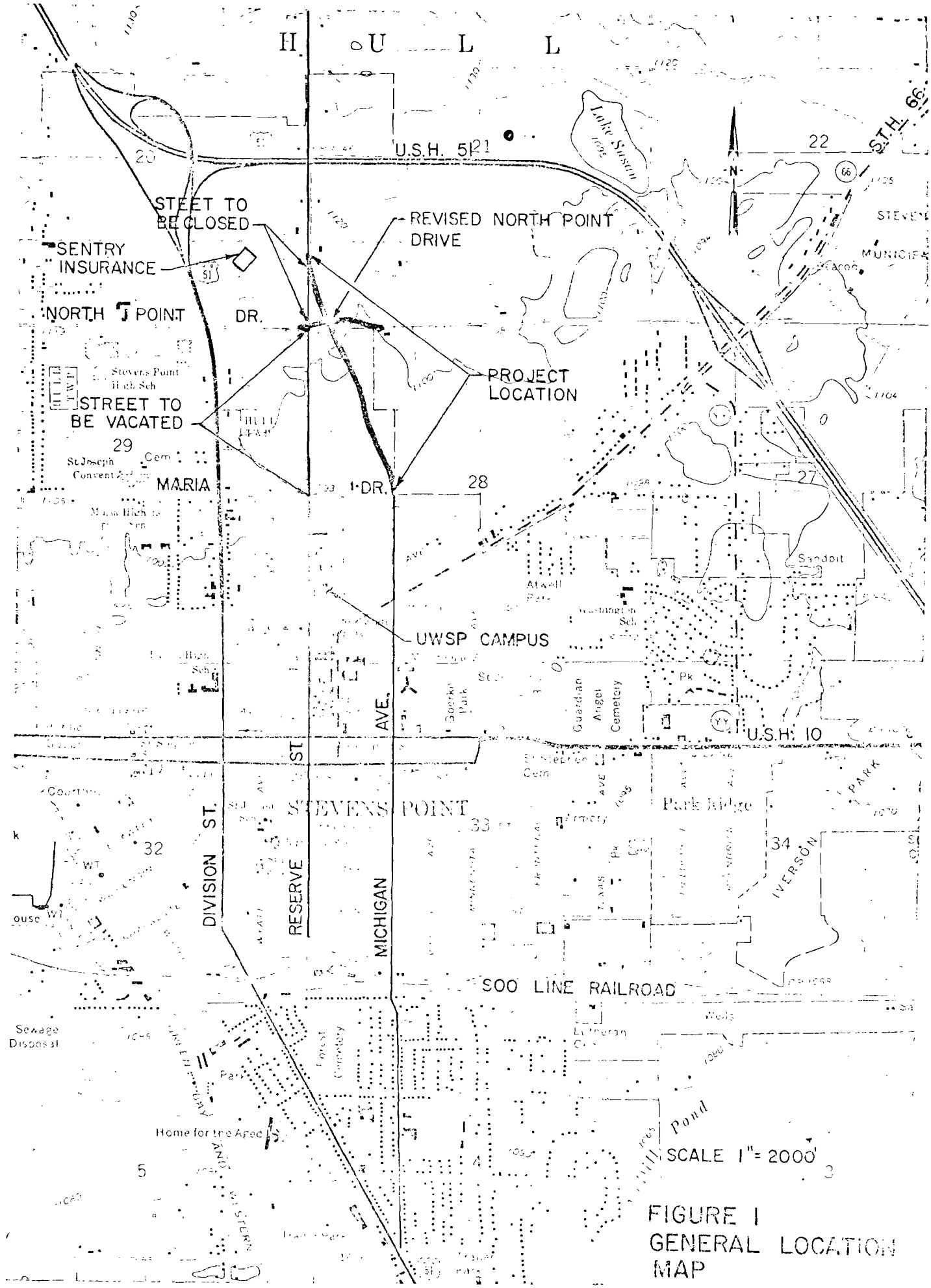



FIGURE 1
GENERAL LOCATION MAP

1/4 of Section 28, T24N, R8E. (See Figure 1 on page 12). Stevens Point is traversed in an east-west direction, south of the central business district, by the Soo Line Railroad. The tracks, yards and facilities of the railroad form an effective major obstacle against continuity in the street system from the south to north sides of the City. Currently, Division Street is the only major north-south route through the City. Michigan Avenue is one of the few streets which cross the railroad, and is, in fact, the most easterly of such streets in the City.

In the northern part of the City, Reserve Street is destined to become an arterial street, since it continues beyond the U.S. Highway 51 bypass through a grade separation structure.

C. History and Background; Need for the Project

An extension of Michigan Avenue to the north has been contemplated for some time, as shown by a Comprehensive Plan, of Stevens Point, Wisconsin, done by Harland Bartholomew and Associates, 1965. During 1974 and 1975, a major business in Stevens Point, the Sentry Insurance Company, is building a large office complex on a parcel of land bounded by Northpoint Drive, Reserve Street, U.S.H. 51 bypass and Division Street. The new Sentry complex will generate traffic primarily in a north-south direction. The initial volume is expected to be about 5,000 vehicles per day, total in both directions, but most of this would occur during the peak morning and afternoon hours. The Sentry complex could be expected to stimulate additional development in its proximity. It would be reasonable to assume that this potential development could add an additional 5,000 vehicles per day in the next 20 years.

The present direct north-south route, Reserve Street, bisects the University of Wisconsin-Stevens Point (UWSP) Campus. Part of Reserve Street at present is a narrow, two lane street, which is one-way southbound. Adding the anticipated additional traffic volume to this street would exceed its capacity, cause a severe safety problem to the many pedestrians in the campus area, would tend to split the campus with a major street, and would cause inconvenience and delays to motorists using Reserve Street.

Several organizations and agencies have provided input into the planning process during the consideration of the manner in which the traffic needs of the Sentry building could be served. The Portage County Areawide Planning Office has been actively involved in corridor location studies. Because of its concern over student safety, the UWSP Administration has been intensely interested in the development of a traffic route that would minimize the potential vehicle-pedestrian conflicts. Sentry Insurance Company has been consulted during corridor location studies.

Campus and community organizations have reviewed and commented on the proposed Michigan Avenue extension. Among them have been the UWSP Community Relations Committee, which on February 13, 1974 heard an explanation from the USWP Assistant to the Chancellor of the need for a new traffic artery. In February 1974, the UWSP College of Natural Resources submitted a proposal for utilization of University land north of Maria Drive, including such uses as hiking trails, sport trails and an arboretum. The UWSP Administration and the University of Wisconsin Central Administration, through their respective planning efforts, have analyzed the assets and liabilities of the proposed extension. A synopsis of their conclusions indicates that, while some

vegetation will be destroyed by construction of the new street, the down-grading of Reserve Street will enhance the safety of the center of the campus, and the vacation of Reserve Street between Maria Drive and North Point Drive will allow a more cohesive outdoor laboratory to be created by joining together the woodlands on either side of Reserve Street. On February 26, 1974, a public information hearing was held concerning the Michigan Avenue Extension, as reported in the Campus newspaper, Pointer, issue of February 28, 1974. Throughout the months of April, May and June, 1974, a number of meetings were held to discuss the project. Attendance at one or more of those meetings included representatives of the City, the UWSP Administration, the UW Central Administration, the areawide planning agency, student government, UWSP faculty, and the UWSP Environmental Awareness Council. These meetings were primarily for the purpose of discussing the various locations which were considered for the proposed street.

D. Relationship of the Proposal with Other Agencies Plans

The area between Maria Drive and North Point Drive, owned by the University of Wisconsin, was previously designated for a more intensive use than the presently planned use. The Long Range Development Plan for Wisconsin State University - Stevens Point envisioned expansion of the Campus into this area. (Daverman Associates, Inc., Grand Rapids, Michigan, July 1968). The projected uses included residence halls, married student housing, a physical education building, athletic fields and arboretum. This much more intensive use would have had a substantially greater impact on the environment of the area than the proposed road will have.

The Stevens Point Comprehensive Plan, mentioned previously, indicates the extension of Michigan Avenue to the north. The proposed corridor differs slightly from the Comprehensive Plan. The reasons for this change will be explained under Part VI, Alternatives to the Proposed Action. An important objective of the University Administration is to downgrade the portion of Reserve Street which runs through the center of the campus. Making the street discontinuous by vacating part of it should discourage some traffic and help to accomplish this objective.

## E. Actions Dependent on the Street Being Completed

The construction of Michigan Avenue north of Maria Drive will permit the vacation of Reserve Street between Maria Drive and North Point Drive. In fact, the conveyance of the Michigan Avenue Corridor right-of-way easement from the University to the City was contingent upon the City vacating this section of Reserve Street upon completion of construction. The University will use the vacated Reserve Street right-of-way to construct hiking and bicycle paths. The vacation of Reserve Street will more effectively permit the University to consolidate its lands on either side of the street into a larger, more effective nature area which can be utilized as an arboretum and outdoor laboratory facility as well as for the above mentioned hiking and bike trails.

## F. Description of the Environment as it Presently Exists

The following text will discuss the physical, biological and cultural characteristics of the project area.

### 1. Hydrological Characteristics

The general flow pattern of the surface watershed is from north to south. Under its existing condition, there would be little overland flow for any extended distance. The relatively flat slopes and porosity of the soil would give the area the characteristics of a ground water recharge area. An examination of the USGS quadrangle map (Stevens Point 7.5') indicates that the approximate boundaries of the immediate watershed would be defined approximately by Division Street on the west, the U.S.H. 51 bypass on the north, a straight line extension of Michigan Avenue on the east, and Maria Drive on the south, which is an area of about 285 acres. A few small channels traverse the project area, but the general pattern would be drainage in sheet form rather than in defined waterways.

One channel flows under Reserve Street at the intersection with North Point Drive, then flows in a southerly direction east of Reserve Street and eventually dissipates into marshy ground. The marshy areas, in fact, will act as a filter to settle out any sediment load from construction activity or erosion, before such sediment can reach any enduring stream or river.

Several areas of wetlands and the extensive wooded areas would limit the amount of ground water recharge because they are areas of high evapotranspiration. The estimated average runoff from the entire Wisconsin River Basin in Portage County, consisting of 505 square miles, is about 370 cfs (cubic feet per second) (U.S. Geological Survey Water Supply Paper 1796, 1965). Using the ratio of 285 acres, or 0.45 square miles for the drainage basin of the project area to the entire Portage County Wisconsin River Basin would indicate an average annual runoff of about 0.33 cfs in the project area.

The ground water basin is comprised of a thin glacial outwash deposit lying on a bed of crystalline rock. The ground water conditions in Portage County occur in several areas, which have been termed "ground water provinces." (U.S.G.S. Water Supply Paper 1796). The project area is located in the "sand-plain province." The outwash deposits consist of well sorted sand and gravel with small amounts of silt and clay. Their thickness in the project area is less than 50 feet. They are underlain by precambrian crystalline rock, which consists largely of granite.

The flow of ground water is from north to south, at a slope of about 20 feet per mile. The ground water table in the project area is at or above the ground surface during wet seasons, which accounts for the standing water in the wetland areas. The chemical quality of the ground water can be characterized as being moderately hard, and relatively low in iron and chlorides. (U.S. Geological Survey Water Supply Paper 1796).

The proposed roadway will have curb and gutter and storm sewer. This type of roadway construction will minimize the damage to the quality of both surface and underground water by restricting pollutants, such as salt, oil, gasoline and other materials which could appear as a result of vehicles using the road. The possible effect of these will be discussed more fully in Section II.

There are no known wells or public water supplies in the immediate downstream area which might be subject to any degradation of water quality.

2. Atmosphere

The Federal Government, acting through the Environmental Protection Agency (EPA), has set up national ambient air quality standards. These standards have also been adopted by the Wisconsin Department of Natural Resources (Wisconsin Administrative Code, Chapter NR 155) and are included in Table 1, page 20. The State of Wisconsin has been divided into eight air quality control regions. Stevens Point is located in the North Central Air Quality Control Region.

At the present time, the Wisconsin Department of Natural Resources (DNR) gathers ambient air quality readings at two locations in Stevens Point for particulate matter and sulphur dioxide. At the present time, the other pollutants included in the ambient air quality standards are not monitored in Stevens Point. The DNR 1973 Air Quality Data Report indicates both particulate matter and sulphur dioxide is well below the secondary air

TABLE I

AMBIENT AIR QUALITY STANDARDS

| Pollutant | Primary | Secondary |
|---|---|---|
| PARTICULATE MATTER | | |
| Annual Geometric Mean | 75 | 60 |
| Maximum 24-hour concentration* | 260 | 150 |
| SULFUR OXIDES | | |
| Annual arithmetic mean | 80 (.03 ppm) | 60 (.02 ppm) |
| Maximum 24-hour concentration* | 365 (.14 ppm) | 260 (.1 ppm) |
| Maximum 3-hour concentration* | | 1,300 (.5 ppm) |
| CARBON MONOXIDE | | |
| Maximum 8-hour concentration* | 10 ( 9 ppm) | |
| Maximum 1-hour concentration* | 40 (35 ppm) | Same as Primary |
| PHOTOCHEMICAL OXIDANTS | | |
| Maximum 1-hour concentration* | 160 (.08 ppm) | Same as Primary |
| HYDROCARBONS | | |
| Maximum 3-hour (6-9 a.m.) concentration* | 160 (.24 ppm) | Same as Primary |
| NITROGEN OXIDES | | |
| Annual arithmetic mean | 100 (.05 ppm) | Same as Primary |

(All measurements are expressed in micrograms per cubic meter ($ug/m^3$) except for those for carbon monoxide, which are expressed in milligrams per cubic meter ($mg/m^3$). Equivalent measurements in parts per million (ppm) are given for the gaseous pollutants.)

*Not to be exceeded more than once a year.

Primary The levels of air quality which provides protection for public health with an adequate margin of safety.

Secondary The levels of air quality which may be necessary to protect public welfare from anticipated adverse effects.

quality standard. Since motor vehicles are not a major emitter of sulphur oxides, this pollutant will not be considered further in this report. Particulate matter consists of dust, smoke, mists, and sprays. Particulate pollution results from any kinds of industrial and agricultural operations and from combustion products, including automobile exhausts.

Other pollutants are carbon monoxide (CO), of which the automobile is the chief source; hydrocarbons, which are also emitted primarily by the automobile; and oxides of nitrogen, which are emitted by the automobile as well as by other sources of fuel combustion.

The overall air quality of a region is affected by many sources of pollutants besides the automobile. Some of these sources include external combustion (furnaces), agriculture, and industry.

Although the most effective reduction of motor vehicle air pollution will probably come from modifications to automobile designs (example: catalytic converters), or limitations on their use, pollutant emissions per vehicle-mile can be reduced by increasing speeds and reducing the number of speed changes through reduced congestion. Thus, a more uniform vehicle flow with a minimum of starts and stops is an effective means of reducing air pollution.

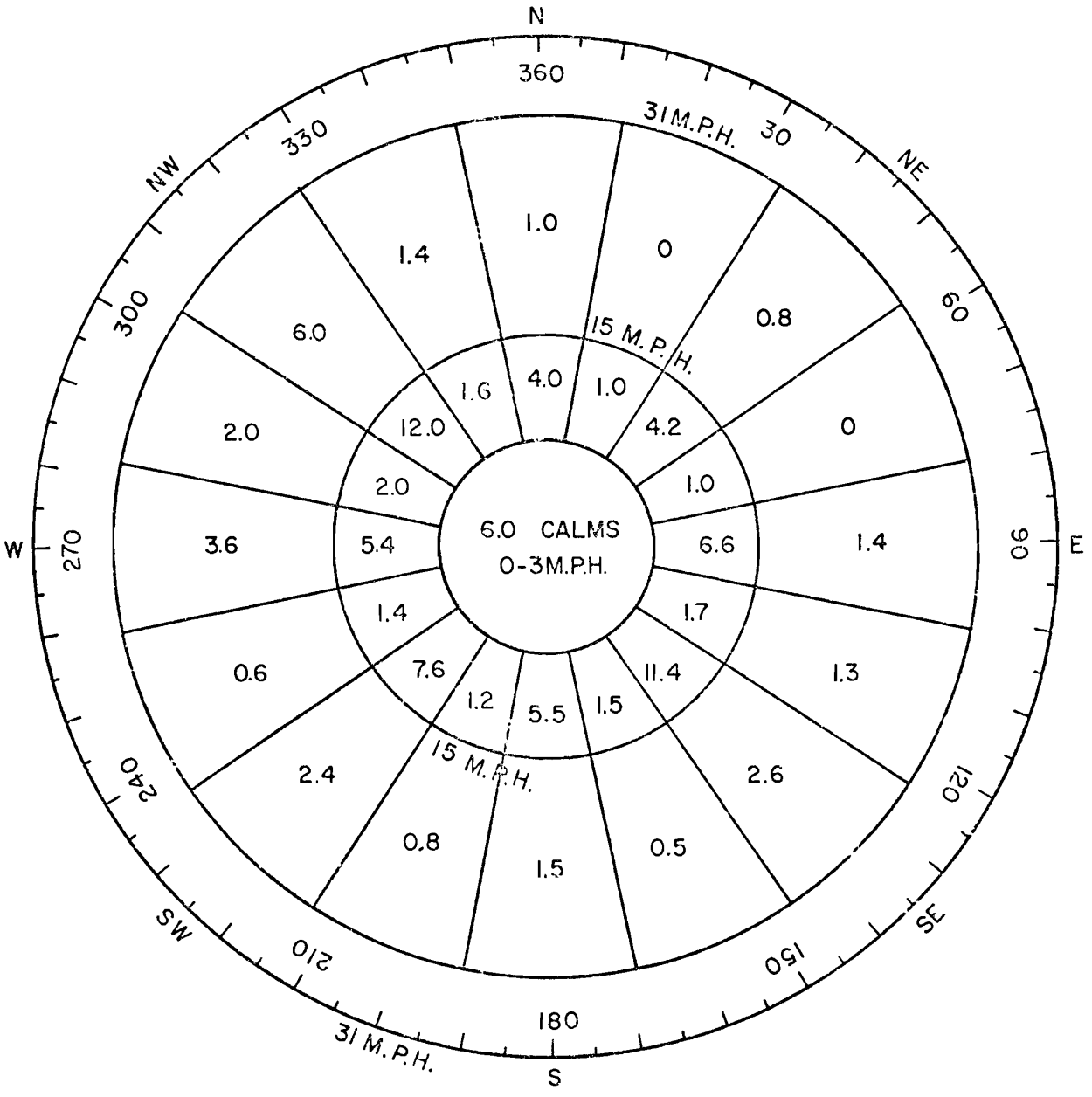
Dispersion of pollutants is a factor to be considered when determining whether the concentration at a particular location will become critical. Wind speed and direction as well as currents created by the moving vehicles themselves, help to disperse any concentrations which are present. A way to

show wind speed and direction graphically is on a wind rose. This shows the various compass directions radiating from the center, and concentric circles representing the wind velocities. The figure in each segment of the wind rose indicates the percentage of time that the wind comes from that direction and at that velocity.

A wind rose is included as figure 2, page 23, for the Stevens Point airport. The data is based on the nearest weather bureau station at Wausau. This shows that 18 per cent of the time the wind is from the northwest. This would be predominately during the winter season. Another 14 per cent of the time the wind is from a southeasterly direction, which is primarily during the summer months. The remainder of the time the winds are calm or from variable directions. On few occasions, therefore, will the pollutants become concentrated without being dispersed.

3. Topography, Geology and Pedology

The project area lies on the southern edge of a large landform region known as the Northern Highland. This particular landform region covers most of Northern Wisconsin (The Geography of Wisconsin, R.W. Finley, College Printing and Typing Co., Madison, 1965). The greater part of the Northern Highland consists of a level to gently rolling surface of relatively low relief. The region is underlain by crystalline rock. Most of the Northern Highland is covered to varying depths by the deposits of continental ice sheets. The soil is stonier and sandier as a result of glaciation than it otherwise would have been. The City of Stevens Point sits on a glacial outwash plain.




# WIND ROSE

NOTE: WIND DATA TAKEN FROM USWB, WAUSAU, WISCONSIN
PERIOD 5 YEARS, 1942-1946.

FIGURE 2

The depth of the material is in the vicinity of 30 to 40 feet, and is underlain by crystalline rock which consists mostly of granite. The slopes are slight, averaging about 20 feet per mile. There are no outcrops of rock in the project area, but the area to the north and to the west of Stevens Point is characterized by surface exposure of the crystalline rock.

Several soil types are encountered within the project area. The predominant type is called Roscommon, and is briefly described as a deep, poorly drained sandy soil with sandy subsoil overlying outwash sand. (Soil survey, Portage County Soil and Water Conservation District in Cooperation with Soil Conservation Service, USDA, 1971). Other soil types found to a lesser extent in the project area are a series called Plainfield, granitic substratum, which is described as a loamy sand over acid sand subsoil underlain by loamy residiuum, a series called Point, described as a deep, somewhat poorly drained, loamy soil over acid loam residuum, and a series called Meehan, which is described as a sandy soil over acid sand on nearly level terraces. All of these soil series can be generally characterized as having high ground water tables, being relatively permeable, and subject to erosion. The water erosion potential is reduced because of the flat slopes, but a wind erosion potential also exists. The soils are not considered to be highly desirable for construction of any kind because of the high seasonal ground water. The productivity of these soils for agricultural purposes ranges from fair to poor. The sandy nature of the soils, the high ground water during wet seasons and the tendency to become dry and subject to wind erosion during dry seasons are limiting factors for agricultural potential. The Roscommon Series has good suitability for wetland food and cover plants.

As mineral resources, the soil series found in the project area are poor for gravel, as little or no gravel is present; are fair to good as sand resources except the Point series which is a loamy soil; are poor as topsoil material, except the surface layer of the Point series is fair topsoil; all the series are fair to good for use as roadfill.

There are no known unique geologic and land-form features in the project area.

4. Sonic Conditions

The area of the proposed construction is on a new alignment through undeveloped land. There are therefore no existing homes or business places of human habitation within 100 feet of the corridor. The existing ambient noise levels measured at five locations are shown in Appendix 3.

Noise is measured in decibels (dB) which is a measurement of the sound pressure level which a source emits. Several different scales of noise measurement can be used, but the normally accepted standard in traffic noise measurement is called the A-weighted sound pressure level (dBA). The A-levels can be read directly from any precision sound level meter. The dBA level is regarded as statistically indistinguishable from the best psychological derived measures in its reliability as a predictor of human response to traffic noise. The noise levels used in this report are $L_{10}$ which is the sound level that is exceeded 10 per cent of the time and $L_{50}$ which is the sound level that is exceeded 50 percent of the time. Figure 3 on page 26 is a graphical display of sound levels caused by certain activities in the typical

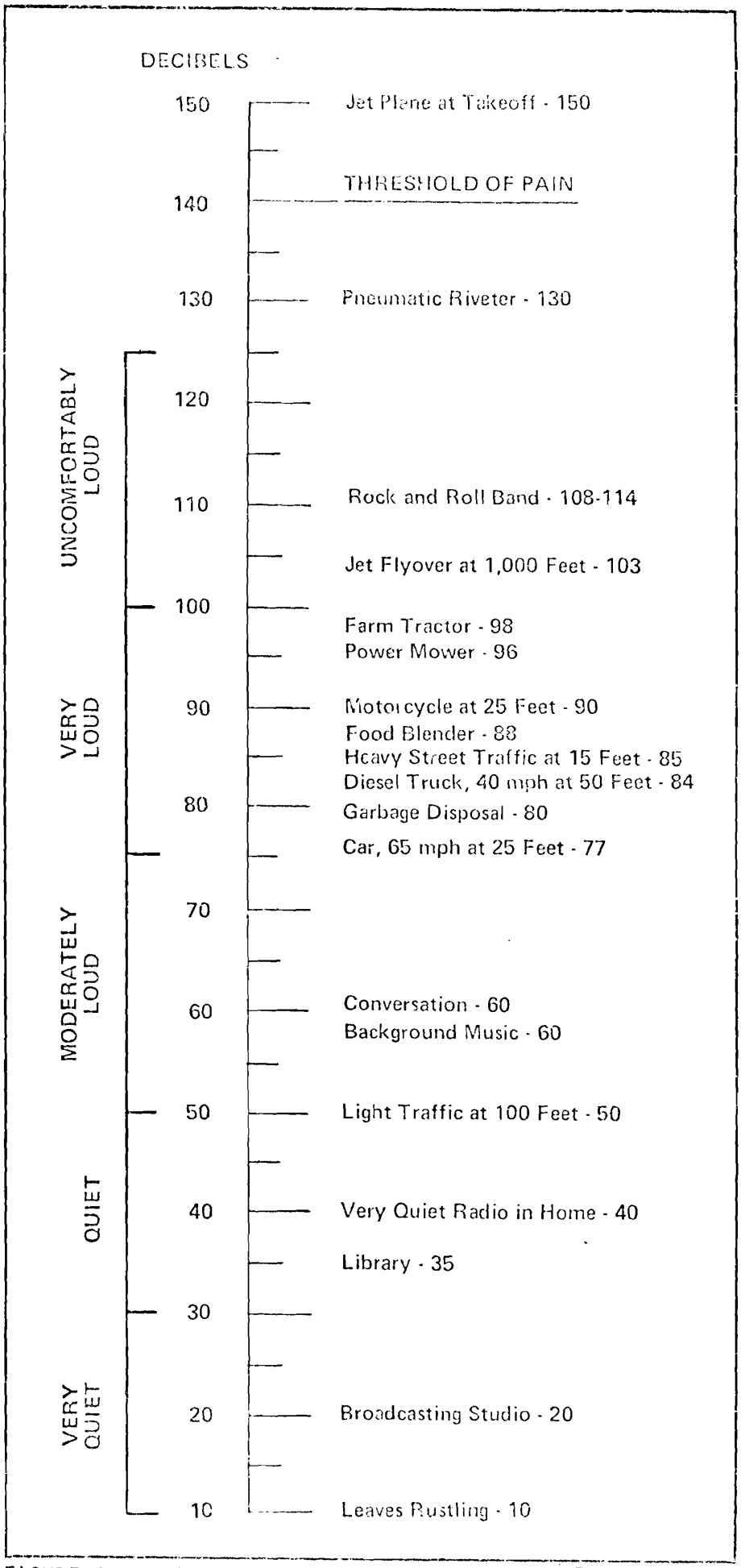



FIGURE 3 Typical Noise Levels in an Urban Environment

urban environment. The proposed new street construction connects on its northern and southern ends with existing streets. On Michigan Avenue approximately 2,700 feet south of Maria Drive is the area Vocational School, and about 3,700 feet south of Maria Drive is the P. J. Jacobs Junior High School. The Junior High School is at the corner of Michigan Avenue and Main Street, which is U.S.H. 10 (one-way street westbound). This is a signalized intersection, thus considerable ambient noise is present because of vehicle starting and stopping. Michigan Avenue is one block east of the Community Hospital and two blocks east of the major concentration of buildings of the UWSP. The area along the east side of Michigan Avenue between the Jacobs Jr. High School and the Vocational School is known as Goerke Park. This is a major complex of athletic fields, including a football stadium and hockey rinks.

5. Visual Conditions

The scenic characteristics of the proposed street would include woodlands, stretches of shrub thickets, and several expanses of wet meadows. The proposed curving alignment of the street will provide a pleasing aesthetic condition along the street, as a view of trees would be predominate. A "tunnel effect" which might be caused by a straight alignment through trees will be avoided. The proposed street will be like a parkway, a rather pleasant drive through a natural area.

The present nature of the area is one of quiet, with recreation the primary use. Because of the size of the parcel, its close proximity to the City and its relative isolation within the City, the area is an ideal location for nature study with relative ease of access for the maximum number of area residents.

## 6. Biological

A biological assessment of the area of the proposed street extension should consider more than the actual right of way and land immediately adjacent thereto. Because of the nature of the area and diverse plant and animal species residing in it, this section will consider the present characteristics and value of the entire block of land which is likely to have a conservancy future. This tract is bounded by Division Street to the west, Moses Creek and built up portions of the Town of Hull to the east, Maria Drive on the south, and North Point Drive on the north. It is currently bisected on a north-south line by Reserve Street and partially interrupted in the north half by two contiguous privately owned ten acre strips. The total area consists of approximately 200 acres of wild land, 50 acres west of Reserve Street and 150 acres east.

### a. General Biological Habitat

The portion most directly affected by the extension of the street would be a 70 acre area bounded by the Stevens Point city limits on the east and north, by Reserve Street on the west, and by Maria Drive on the south. Henceforth, this particular block will be described as "the 70 acre tract". This 70 acres has had a sufficiently varied environmental and utilization history to produce successional circumstances ranging from fresh fire pits in a large grassy glade much used recreationally by university students, and newly cleared survey lines, to groves of mixed woods with large old white pine and red oak trees. In the central part of the 70 acre tract, there are a few enormous white

pine trees, which may even antedate the first lumbering of the region. The proposed street avoids these pines, and will have no effect on them.

The heterogeneity of the area is increased by the effects of relatively minor elevational differences much compounded by a generally high and widely fluctuating water table. The resulting moisture differences, in combination with extensive lumbering and fire impact, have produced a diversity of ecosystems remarkable in such a small area. Over much of the proposed route, this ecosystem diversity takes the form of a mosaic of communities with such low superficial aesthetic value that a non-biologist might well consider them to be a wasteland. Typical communities include: wetlands dominated by rushes, sedges, and grasses; willow and alder thickets; and higher ground dominated by second growth aspen and jack pine.

b. Specific Community Description

The specific vegetation crossed by the 66 foot right of way plus approximately 10 feet on each side is shown on the accompanying map in Appendix 4. Appendix 4 also details the plant composition of these communities.

The southern 1,000 feet of the route passes through relatively wet areas, intermittant marshes dominated by bluejoint, bulrushes, manna grass, and sedges; willow thickets; and grassy and weedy aspen openings. The portion of these communities which would be removed by the proposed street is small relative to their total area north of the campus.

There is abundant evidence in this southern part of the proposed right of way

of a past history of variation in the height of the water table. Much of the low ground has been sufficiently well drained at some time in the past for aspen to become established, but subsequently flooded for long enough that most of the aspen was killed.

From about 1,000 feet to about 1,700 feet north of Maria Drive, the right of way passes over substantially better-drained land. The vegetation here is either second growth jack pine woods, relatively well-drained aspen woods, or openings associated with these habitats. The land to the east is open and dry; that to the west, open and wet. Specific community composition and stage of development along the right of way itself is very much related to the past incidence of fires. There is a conspicuous stand of dense, small jack pine locally interrupted by aspen sprouts or open ground associated with an extensive burn which occurred in 1966.

Overall, there are few evidences of lateral surface movement of water across this 1,000 to 1,700 foot portion of the right of way, even though two sets of five parallel ditches cross the route. These ditches represent a past fire line.

From approximately 1,700 to 1,850 feet north of Maria Drive, the proposed right of way crosses low ground mostly occupied by bluejoint marsh, willow thickets, and wet aspen woods. There is evidence of substantial lateral movement of surface water here. This movement will be accommodated by installation of culverts to prevent the flooding and destruction of extensive aspen woods or significant alteration of the wet lands to the west.

From about 1,850 feet to 2,300 feet north of Maria Drive, the proposed right of way skirts an extensive grassy opening, passing initially through jack pine woods, then through a series of increasingly wet semi-open and wooded areas. The northern 200 feet of this segment is mostly very wet, the proposed right of way passing through an extensive speckled alder stand while running along the willow thickets and bluejoint-bulrush-sedge marshes to the east.

The northern end of the proposed right of way crosses a distinct flowage at about 2,350 feet north of Maria, then passes through young, mixed hardwoods into a mature pine stand before emerging into a Rubus-sweet fern opening at the intersection with North Point Drive. The mixed hardwoods represent a biologically youthful, hardly distinctive or notably valuable ecosystem. The pine woods, on the other hand, represent the most mature ecosystem along the proposed right of way. Probably because of its location remote from the campus, the understory of the pine grove appears to be notably less trampled than most of the woods to the south and west.

The grove includes about 190 white pines, ranging in diameter from 5 to 25 inches; averaging about 12 inches. It also seems likely to have the richest spring flora in the 70 acres.

The other white pine groves on this 70 acres definitely have inferior vegetational diversity in the understory. The mixed pine woods of Chilla Woodlot, west of Reserve Street, are significantly drier, and have very different community characteristics. Hence, even though the grove in question is not the only white pine woods on land close to the university campus, it is a distinctive and biologically valuable asset.

North of its intersection with North Point Drive, the proposed route crosses a 30 foot fringe of quaking aspen into a large grassy meadow. The right of way passes through the meadow for about 150 feet, then traverses a dense stand of young white pine trees for another 175 feet. At its north end, the proposed right of way emerges from the white pine stand, crosses a small open area (85 feet), a 35 foot fringe of quaking aspen, then merges with Reserve Street. Along this whole northern part of the right of way, the land slopes gently to the northeast. The vegetational result is a gradual transition from the dense white pines to a pine-hardwood mixture, then to wetlands dominated by speckled alder. This habitat transition has significance with respect to alternate routes discussed later in this report.

c. Flora and Fauna

Species lists of vascular plants, bryophytes, mammals, birds, reptiles, and amphibians which have been observed in the land under discussion comprise appendices 4B, 4C, 5A, 5B, 5C and 6. It is important to emphasize that this assessment necessarily suffers from the restrictions of a short term, single season period of investigation (late September and October). During wet times, the biological character of all the low lying areas crossed by the right of way may be expected to be significantly different than what can be observed or inferred in the fall of a year when the water table is relatively low. It seems likely that some parts of the proposed right of way support an extensive spring and summer flora, and a seasonal fauna of species which were not detectable at the time of this assessment. Survey information drawn from other times of the year would be a valuable supplement to this report.

Study of bryophyte (mosses and liverworts) collections were not intensive. Additional species undoubtedly exist along the right of way. Many bryophyte species are notably habitat-selective and have a narrow environmental tolerance range. The effect of the proposed road on these relatively inconspicuous plants is likely to be substantial. The proposed road will eliminate or alter some bryophyte habitat. There is no strong reason to suspect any bryophyte species will be eliminated from the area.

Lichens were not surveyed. A reasonable diversity of species may be expected in the shrubby, and more especially in the wooded, areas of the route. Beyond actual physical removal, there are likely to be two contradictory general effects on the lichen flora of a road like the one proposed. The high light intensities associated with the right of way will tend to enhance the growth of many lichen species. At the same time, these symbiotic plants will be among the organisms most sensitive to any decline in air quality. In general, lichens thrive along little used paths and roads, and die where motor vehicle traffic is heavy.

Neither invertebrate animals, nor macroscopic fungi, nor any micro-organisms were surveyed. The primary effect of the proposed road on all of these groups will be a function of the amount of each kind of existing habitat which is removed or altered.

Since at the time of the survey there was absolutely no standing or running water along the proposed right of way, no effort was made to seek information on aquatic organisms of any kind.

The community survey of the land crossed by the proposed road uncovered little that was notable or in itself biologically impressive. What is unique about the tract of land as a zoological resource is the combination of its location adjacent to, and its control by, an academic community; and the relatively great expanse which is not crossed by any notable enduring barrier to animal movement.

d. Fire

Most of the communities along the proposed right of way are notably fire susceptible, at least during unusually dry periods. Fire calls to that 70 acre tract typically run two or three a year. In the past 20 years there have been two major fires, which have had a conspicuous effect on the nature of the present vegetation. Records for the more distant past are unavailable, but when the present district ranger arrived in 1954, fires had had sufficient previous impact that he characterized most of the area as a "wasteland".

On May 7, 1957, a fire started near the intersection of Reserve Street and North Point Drive and proceeded to burn diagonally southeast across 55 acres, generally traversing the entire route of the proposed right of way in the process. Scars from this fire are conspicuous in the mature white pine stand at the north end of the proposed road. Much of the vegetation development along the rest of the right of way dates from that time. Before the 1957 fire was controlled, city fire fighters had been called out against the possibility that homes southeast of the university land might burn.

A second extensive fire occurred in this region on October 10, 1966. Beginning with a camp fire near Reserve Street about midway between Maria and North Point, it eventually burned a 21 acre area presently defined by a circle of five parallel fire ditches. Recent forest regeneration in this area dates from the 1966 fire.

Probably the most fire susceptible of the existing communities along the proposed right of way are the jack pine woods and the adjacent openings. Most of these pine stands are sufficiently open that they would support a ground fire without any major damage to the tree species. Those which are particularly dense could conceivably be completely burned out, in which case the subsequent vegetational regeneration would probably be similar to what is there now.

The bluejoint marshes are fire susceptible at any time when the water table is low, as was conspicuously the case during the formulation of the present assessment. In so far as there is an accumulation of peat in these low wet areas, the substrate itself will burn. No peat fires are on record for this particular land, but peat fires did occur in similar habitats which existed to the south prior to university expansion onto that land.

Probably the most fire resistant vegetation along the right of way is the white pine grove at the north end. Its present existence demonstrates its tolerance to past fires. Some of the wet site, mixed hardwoods communities to the south apparently date from the 1957 fire, and are dense enough now that they would burn readily again during a dry period.

The remaining, shrub-dominated, vegetation types along the proposed right of way

occupy land sufficiently close to the water table, that they are likely to be fire susceptible only in the dryest times.

e. Present Use of Land

No biological assessment could be considered adequate without some consideration of the use of the north campus land by the university community. Intensity of classroom and research use on an enduring basis is difficult to assess, because such use has sharply escalated as a consequence of the recent faculty and student interest in the land. In years past there has definitely been extensive academic utilization, fluctuating in intensity with both curricular changes and professorial inclinations. There is every reason to expect that the recent increase in student and faculty awareness of the biological resources of the north campus will result in an enduring increase in its academic utilization. In the event of short gasoline supplies, laboratory sections which currently conduct field work throughout the county will be forced to stay closer to the campus.

Historically, the greatest teaching use of the land under discussion has been by wildlife, soils, forestry, biosystematics, and ecology courses, roughly in that order. At least one extensive wildlife research project has been pursued on the land. Any new corridor through the land is likely to have some detrimental effect on its academic use. Ironically, development of hiking or bicycle trails will similarly impair its academic value.

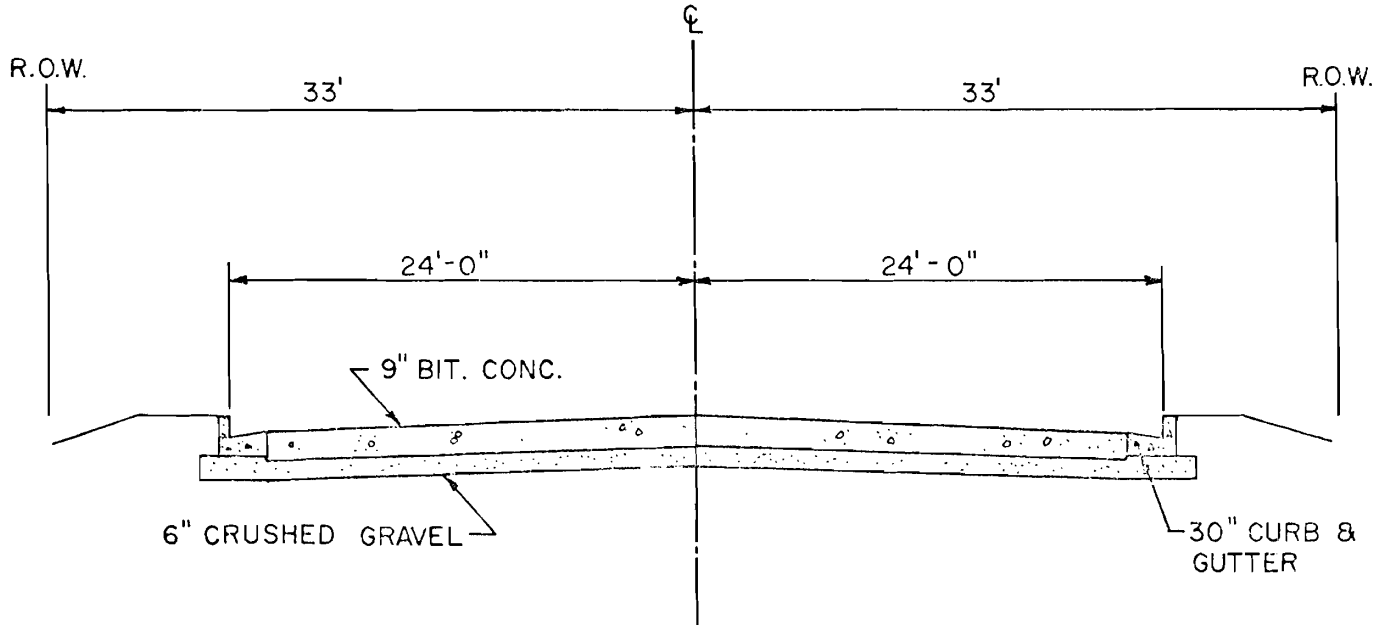
The highly impacted understory of most of the aesthetically pleasant communities

most accessible to the campus testifies to extensive long-term recreational use. The area is used by some students as a quiet, pleasant place to study, and for general recreation. Extension of Michigan Avenue will definitely degrade the tranquility of areas which are now remote from roads. At the same time, closing Reserve Street will upgrade that aspect of the aesthetic environment along that road.

Response was solicited from student special interest groups. They were asked to indicate the anticipated effects of Michigan Avenue on the particular concerns of their membership. Specifically, opinions were sought from the UW--SP Environmental Council, the Student Advisory Board for the College of Natural Resources, the Beta Beta Beta Biological Society, and student members of the Wildlife Society, the Society of American Foresters, and the Soil Conservation Society of America. The responses comprise appendix 7.

## G. Detailed Description of the Street Project

The proposed street corridor is located as shown in figure 4, page 38. The right of way is 66 feet in width. The street is to be located on an easement granted to the City by the University of Wisconsin Board of Regents, and on a right of way dedicated to the City by the Sentry Insurance Company. The route will be designed as a parkway. The sharpest curve on the project will be a 750 foot radius and the maximum grade will be approximately 2%. The street will consist of four 12 foot wide lanes, or two in each direction, with curb and gutter on each side, for a total width from face of curb to face of curb of 48




# CROSS SECTION

# MICHIGAN AVE. EXTENDED

FIGURE 4

feet. The curvature of the street will provide an approximate design speed of 40 miles per hour. The posted speed limit however, will be 25 miles per hour. The initial traffic volume expected would be in the vicinity of 5,000 vehicles per day total, with a peak hour flow of 765 vehicles in one direction (assume 1 peak hour in the morning and one peak nour in the afternoon). The City of Stevens Point is assuming that a 3% annual growth in traffic will occur over the next 20 years, which gives a 1994 morning peak hour flow of about 1,500 vehicles and an afternoon peak hour flow of about 1,500 vehicles. The proposed facility will readily handle the projected 1994 traffic volumes. Any capacity problems which occur could be expected elsewhere in the Michigan Avenue corridor due to signalized intersections.

The cross section of the street is shown in Figure 4. The construction materials and methods will be in accordance with City of Stevens Point specifications. Since final design of the street is not yet completed, the location and design of drainage structures has not been determined. Such structures will be required, however, to accommodate both existing drainage ways which cross the road, and for drainage from the roadway structure itself. The storm sewer will discharge into Moses Creek, which crosses Michigan Avenue just south of Maria Drive, and then ultimately into the Wisconsin River.

Street lighting along the proposed route is not planned.

The construction of the street project is anticipated to start during the winter of 1974-75. Drainage and gravel base course are expected to be completed in the Fall of 1975, and the final street paving, curb and gutter and seeding during

the summer of 1976. The total project cost of this street, including engineering and construction, will be approximately $550,000. The construction of this street will generate certain public service requirements, including street maintenance, litter pickup and snow removal. The performance of these requirements should require no more funding or personnel over what other existing similar streets would require. In fact, considering the vacation of Reserve Street, the increase in net centerline length of City streets in Stevens Point will be negligible.

# II. PROBABLE ADVERSE AND BENEFICIAL IMPACT OF THE PROPOSED STREET ON THE ENVIRONMENT

## A. Introduction

Two primary objectives of the proposed project are to increase the safety and efficiency of pedestrian movements across Reserve Street through the UWSP campus by removing through traffic from that street, and to provide more convenient access to a new office complex which is a major employer in the Stevens Point area. The achievement of these goals will be beneficial to the University students and staff and to the citizens utilizing the new street. There will, of course, be other impacts--both positive and negative--on the man-made as well as on the natural environment when the proposed street is constructed. It should be noted that many of these impacts will apply only to the new portion of the proposed street. Other effects will apply to the existing portions of Michigan Avenue and Reserve Street as well.

The construction of the proposed street represents a commitment of land and resources for the future and thus forecloses certain future options. For example, as stated previously, the former Wisconsin State University-Stevens Point Long Range Development Plan called for married student housing and other uses in the area of the proposed street construction. A change downward in the ultimate projected student population has made that plan invalid. The construction of this street project, while not precluding a future change in University planning for a higher use for the area, would certainly require at least another partial master plan because of the changed street pattern.

B. Water Quality Impact

The proposed construction will have no significant impact on underground water quantity or flow. The broad drainage pattern will not be seriously affected by the proposed street, because the general pattern of "sheet" drainage is parallel to the street. There are a few existing drainage channels which cross the street corridor transversely. The design of the drainage structures must consider these channels, and accommodate the flow within them.

The use of salt on the street for deicing can be expected to affect the sodium and chloride concentrations of the surface water, and to some extent the ground water as well since the ground water is at or near the surface during at least part of the year. In addition, certain trees in the area have a low salt tolerance, such as the sugar maple, red maple, and white pine. Other trees, including most oaks have good salt tolerance. Grasses are not injured by deicing salts as readily as trees. (The Salt Tolerance of Roadside Vegetation, Lucian W. Zelazny, University of Connecticut Symposium: Pollutants in the Roadside Environment, February 1968.) The potential degradation of water quality and possible plant damage can be minimized by spreading only enough salt to produce a safe driving surface and salting only when clearly justified. This can be readily accomplished by proper calibration of the spreaders used to spread the salt. A typical calculation for chloride concentration from salt is shown in appendix 2. However, the closure of Reserve Street will remove that street's potential chloride contribution from the watershed.

The urban type design of the proposed street, with curb and gutter and a storm

drainage system, will reduce the amount of salt which runs off directly onto the adjacent woodlands and wetlands. Certainly some salt will be pushed over the curb with snow plowing, and salt brine will be splashed by vehicles. There is evidence that woody plants tend to accumulate salt over the years and some of the more sensitive ones may eventually be affected. (Effects of Deicing Salts on Water Quality and Biota, Highway Research Board, National Cooperative Highway Research Program Report 91, 1970).

C. Air Quality Impact

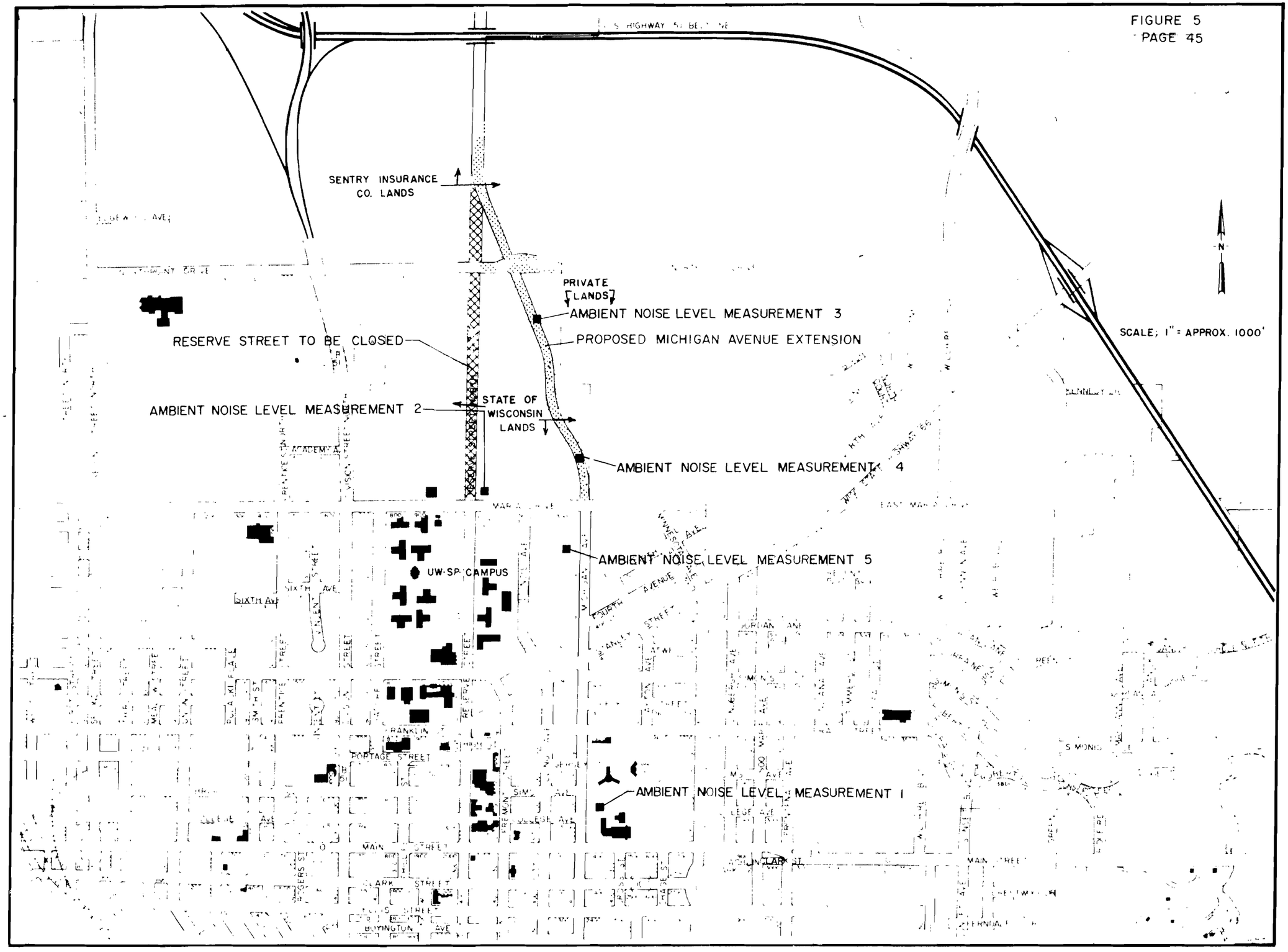
During construction, dust, smoke and equipment emissions will temporarily degrade the quality of the air near the proposed facility. It is not possible to quantify the impact of the construction work on the air quality, but past experience has shown that the effect will be relatively insignificant, beyond the construction period.

After construction, vehicular emissions will degrade the air quality along the route of the proposed street. Calculations indicate that the concentrations of these emissions will be well below the maximum allowable concentration. A procedure called the Environmental Capacity Method provides a means for structuring highway air quality studies and an indicator of air quality impact of proposed highways. The environmental capacity of a given roadway is defined as that set of conditions which if exceeded shall cause a violation of the National Air Quality Standard.

Under this method, a series of capacity curves are presented which describe the maximum peak hourly traffic volumes which can be exceeded under generalized most adverse meteorology conditions before the National Ambient Air Quality Standards for carbon monoxide (CO) will be exceeded at a given distance from the roadway. A capacity curve is included as Appendix 1 which shows that the environmental capacity is not exceeded for this proposed road. Since a large percentage of the winds are from the northwest or southeast, this parallels most of the proposed corridor and will have a beneficial effect on dispersing pollutants.

D. Noise Impact

After completion of the proposed new street, vehicular operations will increase the noise levels near the facility. Calculations for predicted future noise levels were made for location No. 5, shown on Figure 5, page 45. It was assumed that future traffic volumes will be very similar at locations 1, 3, 4 and 5, so location 5 was used as an indicator of the predicted noise levels at the other locations also. Two separate calculations for noise prediction were made: One assuming a traffic flow containing 5% trucks, and another assuming 0% trucks, both conditions for expected peak hour traffic. All calculations are based on assuming an observer located 100 feet from the center of the near traffic lane. The predicted $L_{10}$ noise levels (noise level exceeded 10% of time) are 75 dBA with 5% trucks and 64 dBA with no trucks. The Federal Standard for residential exterior noise levels is 70 dBA. The noise reduction from outside to inside in average residences with open windows is 17 dBA. The


SENTRY INSURANCE CO. LANDS
PRIVATE LANDS
AMBIENT NOISE LEVEL MEASUREMENT 3
PROPOSED MICHIGAN AVENUE EXTENSION
RESERVE STREET TO BE CLOSED
AMBIENT NOISE LEVEL MEASUREMENT 2
STATE OF WISCONSIN LANDS
AMBIENT NOISE LEVEL MEASUREMENT 4
AMBIENT NOISE LEVEL MEASUREMENT 5
AMBIENT NOISE LEVEL MEASUREMENT 1
UW-SP CAMPUS
SCALE; 1" = APPROX. 1000'
N
MAIN STREET
PORTAGE STREET
FOURTH AVENUE
CLARK STREET
BUKINGTON AVE
SIXTH AVE

recommended inside noise criterion in residences is 51 dBA. The predicted inside noise levels based on these calculations are 58 dBA for 5% truck traffic and 47 dBA for no trucks.

## E. Biological Impacts

### 1. Impact on Existing Communities

Extending Michigan Avenue over the proposed route, assuming a 66 foot right of way, would result in the direct removal or burying of biological communities covering approximately 5.3 acres of land. Additionally, a general estimation can be made of the total area of peripheral communities in which the light, wind, atmospheric moisture, and ultimately the vegetational composition would be significantly altered by the presence of the road. Making such estimation on the (conservative) basis of 30 lateral feet of additional disturbance in woods, 15 lateral feet in shrub thickets, and 10 lateral feet in marshes, the area of peripheral impact of this proposed right of way is approximately 2.8 acres. Measures which can be taken to reduce such effects include the use of a minimum width right of way, and restriction of traffic to low speeds to minimize the need to prune line of sight obstacles across the curves on the route. It is not possible to make a similar impact calculation for the effect of the right of way on the soil moisture environment because of the complicated hydrology of the area. Minimizing the use of fill, and intensive attention to providing culverts for existing flowage channels will, of course, help to keep such impact low.

2. Southern Portion of the Route

The southern 1,000 feet of the proposed project will require some road fill and the principal effect of this fill on existing ecosystems would be likely to be through alteration of the drainage patterns. Such drainage alteration in most areas would be relatively small because of the prevailing north to south tendency of surface water movement in most parts of the area. If the road did, in fact, alter drainage patterns, the biological effect would either duplicate or compound the effects of past fluctuations in water table height. In any event, all areas of significant lateral water movement will be identified and provided for by appropriately placed culverts.

3. Central Portion of the Route

In the segment of the proposed street construction which is from 1,000 to 1,700 feet north of Maria Drive, one potential area of drainage interference may exist -- about 1,400 feet north of Maria Drive. Here, the right of way crosses an eastward extension of the large willow and bluejoint marsh to the west. Cross drainage will be provided at this point so as to prevent an accumulation of surface water east of the road, and the effective drowning of some of the dry land communities there.

The effect of road fill along the 1,000 to 1,700 foot segment is otherwise likely to be relatively small. On the other hand, the location of the route on this high ground will result in the destruction or substantial alteration of about 50% of the jack pine stands in the 70 acre tract. As was the case with

potential impact from drainage changes to the south, the environmental alteration of the jack pine communities here would tend to be similar in many respects to the effects of past disturbances. Clearing a right of way, like fire, opens up a community, and decreases the environmental modification caused by the vegetation. Temperature extremes, wind movement, atmospheric dryness, and ground surface light intensities all increase as a result. (In both instances, the effects on animals would very likely not be very similar to the effects of past disturbances.)

In most respects, the jack pine and aspen woods which would be so heavily impacted by the central portion of the right of way do not represent biologically notable or successionally advanced ecosystems. Moreover, they represent vegetation types especially abundant in the immediate vicinity of Stevens Point. One exception is the occurrence of a dense population of a low growing herb, Potentilla tridentata (Northern cinquefoil), in a single opening associated with the jack pines. As far as we know, this species has not previously been collected in Portage County. It is easy to overlook, however, and may well exist elsewhere in the 70 acre tract.

These communities have also been the specific locations of most of the daylight deer and grouse sightings made during the field work for the biological assessment.

For the section of the proposed street which is located about 1,800 to 2,300 feet north of Maria Drive, the impacts are essentially similar to those described previously. Since much of this segment is wooded, the alteration in the light, atmospheric moisture, and wind environment of a strip on each side will be

extensive. There are few signs of lateral water movement in this area. Still, the opening to the west is significantly higher ground, and to prevent the possibility for the right of way to create a local impoundment after heavy rain, provision will be made for runoff to cross the route.

4. Meadow

About 2,200 feet north of Maria Drive, just to the west of the proposed right of way is a meadow. It seems especially important that the right of way remain as remote as possible from this meadow, visually and audibly. In order to prevent the fringe of small trees that currently exists between the proposed right of way and the meadow from being inadvertantly destroyed during road construction or, for the meadow itself to be used as a dumping, storing, or vehicle turn-around area, active steps will be taken to avoid such impact. The erection of a temporary fence during construction might be helpful. Once construction and the hauling of fill from a proposed campus lake site are completed, it might be appropriate to restrict the movement of trucks across this route.

5. White Pine Grove

At the white pine grove located about 2,600 feet north of Maria Drive (about Station 40) the 66 foot right of way would result in direct removal of about 50 of the pines. While decreasing the total community area by 1/4, the projected route also divides a large stand into two smaller ones. In general, community stability is proportional to community size for any particular kind of community. If the community becomes subdivided into areas too small to effectively maintain

the community environment and reasonable sized breeding population of its component species, it is likely to become much degraded, or even eliminated. This is particularly true of a stand such as this one, in which the age, history of disturbance, and canopy type of the community contrast strongly with adjacent vegetation.

White pine is notably vulnerable to both automobile exhaust pollutants and to road salt. If the Michigan Avenue extension were heavily used, the remaining trees closest to the right of way could become physiologically weakened. Unhealthy trees are likely to become vectors for pathogens which can attach remaining, healthier trees. The good air circulation typical of our climate generally, and this region specifically, do, in fact, decrease the likelihood of dangerous pollutant levels. On the other hand, the probability of heavy early morning traffic on cold, clear mornings may increase such likelihood.

6. Impact on Animal Life

The proposed extension of Michigan Avenue is likely to affect animal populations in a significantly different way than plants. Most macroscopic land animal species have at least a limited ability to adapt to the loss or alteration of part of their natural habitat. On the other hand, a road may act as a highly effective barrier to animal movements, and the traffic associated with the road may produce road kills and behavioral responses which have a significant effect on the overall population.

Extending Michigan Avenue to the north along the proposed route will redistribute the relatively unbroken areas of land. The existing continuous 150 acre tract

east of Reserve Street will be separated into an approximately 60 acre area between Reserve and the Michigan Avenue extension, and an approximately 85 acre area to the east. (The residual four or five acres would be directly covered by the proposed road.) A substantial part of the second tract, of course, may well be covered by a proposed campus lake. The vacation of Reserve Street would partially restore continuity between the parcels on either side of Reserve, but retention of a utility service trail will prevent this merging from being complete. The resulting, relatively unbroken land would comprise approximately 110 acres. It is impossible to precisely anticipate the biological consequences of this resectioning of the area, but some problems may be anticipated as described below.

One principal limitation on the number and population size of many animal species in the area now is probably the proximity of street lights, traffic noise, and human activity. In the early evening, one cannot help being aware of the light and traffic of Reserve Street even 700 or 800 feet into the presently undivided land. The animals which currently inhabit the area demonstrate by their very existence here at least some tolerance to human impact.

If an extension of Michigan Avenue attracts human use comparable to that presently associated with a strip along Reserve Street, the north campus land may well become marginal habitat for some species of large animals, colonized only in years of peak populations. Closing Reserve Street to motor traffic and removing the lights along its right of way might alleviate the problem for some species, allowing them to shift their home range westward into the land flanking and to the west of Reserve. Such a shift could not occur for some species, however, because comparable vegetation types do not exist west of Reserve.

## 7. Mammals

The present density of white tailed deer on the land can be estimated at 5 or 6 per 50 acres. A year ago, wildlife researchers could account for seven individuals, and at least six have been sighted in the present survey. These animals have been conspicuously associated with the right of way (which currently represents the interior part of the unbroken tract of land.) The deer frequently bed down in the bluejoint marshes, which are currently quite dry, and have typically been sighted in or around the jack pine woods at dusk. Both the dense stands of older jack pine and the younger pine on the proposed right of way are heavily used by deer for shelter and travel lanes. Since an extension of Michigan Avenue would bisect the home ranges of these, as well as of other animals that use these vegetation types, encounters with vehicles are inevitable. In the absence of data on either the size of small mammal populations or on expected traffic volume, no reasonable estimates can be made of the significance of the effects of road kill.

## 8. Birds

Ruffed grouse populations are apparently not particularly large. The extensive loss of jack pine woods will effectively decrease the areas where they will tend to take cover. Predictions of effects of the road on other species of birds observed in the area require information on the numbers of breeding pairs whose habitats would be destroyed or significantly altered. Such information could be gained only with especially intensive study over an extended period of time. The bird species list would be much more informative if spring and summer surveys of transient populations could be made.

## 9. Reptiles and Amphibians

This proposed roadway extension will have substantial impact on reptile and amphibian populations that reside in the area, particularly in the Spring as many of the native amphibians congregate and move through this area to the spring breeding ponds. Amphibians are especially prone to road mortality during the reproductive season because they are often attracted to roadways due to thermal differences between the road surface and surrounding air. This is especially true at night. Also, except for the spring migration to and from breeding sites, most amphibians move very little during the course of their lives.

It is important to remember that both amphibians and reptiles are very secretive animals. Often their presence in any area may go undetected for years. Therefore, it is virtually impossible to survey an area to determine species diversity and numbers, in a short period of time.

## 10. Long Term Effects

Most of the anticipated effects of extending Michigan Avenue discussed above would result during or shortly after the construction of the road. In the long run, many of the communities would reach an equilibrium with the road-altered environment. This is especially true of the substantial majority of communities along the route which represent relatively early successional stages, and are presently dominated by youthful plant individuals. In the cast of successionally more advanced ecosystems dominated by larger, older

plants, the attainment of such an equilibrium with the road environment can be expected to be much slower, and the degree of alteration of the biological community more extensive.

## F. Geologic and Topographic Impacts

The preliminary grade line for the proposed construction indicates that most of the street will be in a one to three foot fill. Thus earthmoving will be minimized. No severe slopes will be created by the construction, therefore no significant erosion will occur. If the final construction plans indicate that potential areas of erosion are likely, measures to alleviate the problem can be included in the construction procedures, such as sodding, mulch, and ditch checks. Certain amounts of soils and mineral aggregates will be required for the street construction. Because of the nature of the area adjacent to the proposed street, borrow pits will not be permitted. Any borrow or fill required will have to be brought in from another site. Any mucking or poor base material excavated will be hauled away from the site to a landfill or disposal area.

## G. Visual Impact

The view from the proposed street will be aesthically pleasing. The area north of Maria Drive will provide a varied vista of wetlands, open area containing mostly marsh grass, and trees of various types and sizes. Because of the limited right of way width, some of the larger trees may actually have limbs hanging over the roadway. This will provide a kind of parkway effect. The

curving alignment of the road, however, will preclude any appearance of a tunnel through the trees. The vegetation will also shield the road from open view of an observer who is some distance away, thus the entire length of the proposed street is not likely to be seen from any one spot in the adjacent lands.

Litter could be a detriment to the visual quality of the project area. The potential magnitude of litter is unknown, but it is evident that some effort will be required to occassionally collect and dispose of litter that is deposited along the proposed street.

H. Social, Cultural and Economic Impact

The estimated $550,000 cost of the project are public funds provided by local and area taxpayers. On the other hand, a substantial portion of this cost will go to local labor and materials during the course of construction. Thus, a number of jobs will be provided for temporarily.

Little land is removed from the tax rolls for the street right of way because most of the lands are publicly owned.

Because the proposed street is on a new location, there will be no disruption of existing people or facilities; and no inconveniences created, except where the proposed Michigan Avenue extension meets North Point Drive and Reserve Street. Both of these locations have alternate routes which can be used during construction.

The construction of this street, in itself, will not necessarily cause any

increased development. The Sentry Insurance Complex, however, is expected to be a catalyst for development activity in the northern part of Stevens Point, along both Reserve Street and North Point Drive. The proposed street will provide a more efficient link between the anticipated area of development and the rest of Stevens Point. Such development will require an expansion of the usual City services such as education, utilities, public health and welfare, etc. As stated, such development may occur whether this proposed street is constructed or not, but the proposed street will provide better access and could accelerate area development.

Some mention of the fuel situation should be made. There is not sufficient information available to indicate the duration or eventual magnitude of fuel shortages. Recent State of Wisconsin gas tax revenues indicate a 5% to 10% reduction in revenues below a year ago. This does not necessarily effect predicted traffic volumes on this proposed street, however, since much of the projected traffic is present elsewhere in the City and will be merely rerouted from former destinations.

Michigan Avenue has been planned since at least 1966 to be a north-south arterial street. (Official street plan for Stevens Point.) At the present time STH 66 is on Michigan Avenue from Stanley Street to Clark Street. Recently traffic signals were added at the intersections of Michigan Avenue and Main Street and at Michigan Avenue and Clark Street. Michigan Avenue has also been recently widened between College Avenue and Ellis Street.

The proposed street extension will have an effect of increasing traffic on the remainder of Michigan Avenue which is existing, particularly on the portion

between Maria Drive and Main Street. Except for a couple of small commercial and industrial areas, the entire length of Michigan Avenue is zoned residential (Stevens Point Zoning Map). This is mostly single family residential with some two-family and some multiple family residential. The traffic increase will have little bearing on property values. If the traffic increase requires a widening of the existing portion of Michigan Avenue, a detrimental effect would occur to some properties because the street would be quite close to some homes. If commercial zoning should start to encroach along Michigan Avenue, certain property values could increase because commercial property in general is valued at a higher rate than residential.

The traffic generated over the proposed street will probably require further improvement and widening on portions of Michigan Avenue. Most of this street, except for the segment recently improved, is of substandard width to accommodate the projected traffic. This need for widening will also be accelerated by the City's projected grade separation structure on Michigan Avenue at the Soo Line Railroad tracks. In past City policy, the cost of the improved and widened streets such as this have not been assessed to abutting properties, but are general City expenses.

The construction also means a further commitment of the private motor vehicle as a primary transportation system. The corridor could, of course, be used in the future for mass transit, and would provide an ideal corridor in particular for an express bus type of system from the southerly portions of Stevens Point and environs.

An economic benefit in savings of time and fuel will be provided by the new

facility through smoother traffic flow. Keeping increased north-south traffic from Reserve Street by closing part of it will provide a safer campus area for pedestrians, and reduction of potential injuries or loss of life.

## III. PROBABLE ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

### A. Salt Pollution

Some salt pollution will caused by the use of deicing salts on the street. The increase will not be harmful to animals or people, but it may ultimately accumulate in and harm some of the susceptible woody plants. The effect on the area will be minimized however, because the vacation of Reserve Street will not require salt to be applied to that street. The effect is further reduced by the storm sewer collection system which prevents most of the salt applied from reaching adjacent roadside lands. Judicious use of salt using only when and where it is needed such as at curves and intersections will also reduce the potential harm.

### B. Air Pollution

During construction, temporary air pollution will be caused by construction operations. The stripping of vegetation in the construction area and consequent exposure of underlying soils may be a source of dust and wind erosion. Techniques such as sprinkling, temporary seeding and mulching can be used to minimize such effects. Burning of clearing and grubbing debris must comply with State Air Pollution Control rules and local ordinances. Burning in Stevens Point is allowed by permit and will produce temporary air pollution if trees and stumps are disposed of in this manner.

C. Noise

Noise will increase in the area adjacent to the proposed street. This noise will be particularly disturbing to wildlife during the construction of the street because noisy heavy equipment will intrude on a relatively quiet area. The impact will attenuate somewhat as the animals become used to noise in their presence. After the street addition is completed, vehicular noise, particularly trucks, will increase along the entire length of Michigan Avenue.

D. Loss of Woodland, Wetland and Wildlife Habitat

The greatest impact would be in the loss of perhaps 1/4 of the stand of white pines which are just south of North Point Drive. Alternate routes could perhaps save some of them, but the alternates have other adverse effects. This will be discussed further under Part VI, Alternates. The other woodlands lost are not unique and consist mostly of less mature trees. The loss of the woodlands and wetlands used for the proposed project are not a significant percentage of the total existing in the area. The loss of this natural area will, however, have some adverse effect on the wildlife habitat, not only through the loss of the woodlands and wetlands themselves, but because the proposed street also severs part of the total parcel off from the rest, thus reducing the range of habitat for small animals somewhat. The range will be increased somewhat, however, by the vacating of Reserve Street and allowing that corridor to grow back closer to its natural state.

The proposed new corridor makes a change in air, light and moisture conditions adjacent to it, which will affect the habitat of some plant life.

## IV. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The short-term environmental gains associated with the proposed street project include less air pollution and less noise than existing or alternate routes, because of the smoother flow of traffic.

As long-term environmental losses, the character of the area through which the new street passes will be permanently changed, because the street bisects a natural area. A number of mature pine trees will be removed to provide for construction of the project, as described previously. However, additional large pines and hardwoods along Reserve Street will be preserved, which would otherwise have to be removed if Reserve Street would be improved. This is discussed further under Alternates to the Proposed Action. The use of the land directly involved in the street right of way is lost to its present use of plant and animal habitat and outdoor study and recreation.

The short-term environmental losses are basically the noise, dust and equipment emissions which will occur during construction. Since there are no homes or structures nearby, the effect on the human environment will be minimal. There will be a disruption in the habitat of animal life in the area as a result of this construction activity.

This street improvement will be a long-term facility. When considered in this light, a long term gain is the improved safety and reduced vehicle-pedestrian conflict in the UWSP Campus area because of a reduction in traffic through the

campus on Reserve Street. Vacating Reserve Street north of Maria Drive permits the parcels on either side of Reserve Street to be joined into a larger parcel, with a wider range of habitat for plants and animals.

## V. IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION IF IT IS IMPLEMENTED

The land on which the proposed street is to be built can be considered irreversible commitment of that land. The commitment of this land is a total of about 4.3 acres of University land and approximately 2 acres of Sentry Insurance land. The vacation of Reserve Street will remove about 4 acres of land from street use and return it to natural or recreational use. The construction of the project will utilize mineral aggregates, asphalt, cement, fuel and other materials which are generally considered irretrievable under present conditions. A substantial amount of labor will be involved in the construction and, although irretrievable, the commitment of manpower to this labor will provide jobs and aid the economy of the area.

A portion of the habitat for the plant and animal species previously mentioned will be removed.

# VI. ALTERNATIVES TO THE PROPOSED ACTION

## A. Maintain Existing Conditions

One alternative considered was doing nothing. This would be an undesirable alternate because it would require traffic to use existing streets which are in some cases already at their capacity. Overcrowding of streets would increase the probability of accidents and thus endanger pedestrians and motorists. The accompanying congestion and delays would be an economic loss to those involved. Air pollution would increase because of nonuniform vehicle speeds and more starts and stops. The pedestrian safety in the UWSP Campus area would probably diminish because more vehicles would be forced through the area, creating more potential vehicle-pedestrian conflicts. Vehicles could be forced onto streets which heretofore were relatively quiet and with few cars. Both existing Reserve Street and North Point Drive adjacent to the new Sentry insurance complex are narrow, two-lane roads, and would be very conducive to delays and accidents from the anticipated traffic. Reserve Street through the main campus area is a 2 lane one-way street southbound. Through the campus residence hall area, Reserve Street has parking permitted on the west side; this parking would have to be removed to provide for increased traffic. Biologically, however, doing nothing is the most favorable alternative.

## B. Alternate Routes Through University Land

A number of variations of the proposed route have been considered. (See Figure 6, page 65). During preliminary discussions between City officials, University administration and interested faculty and student groups, it was

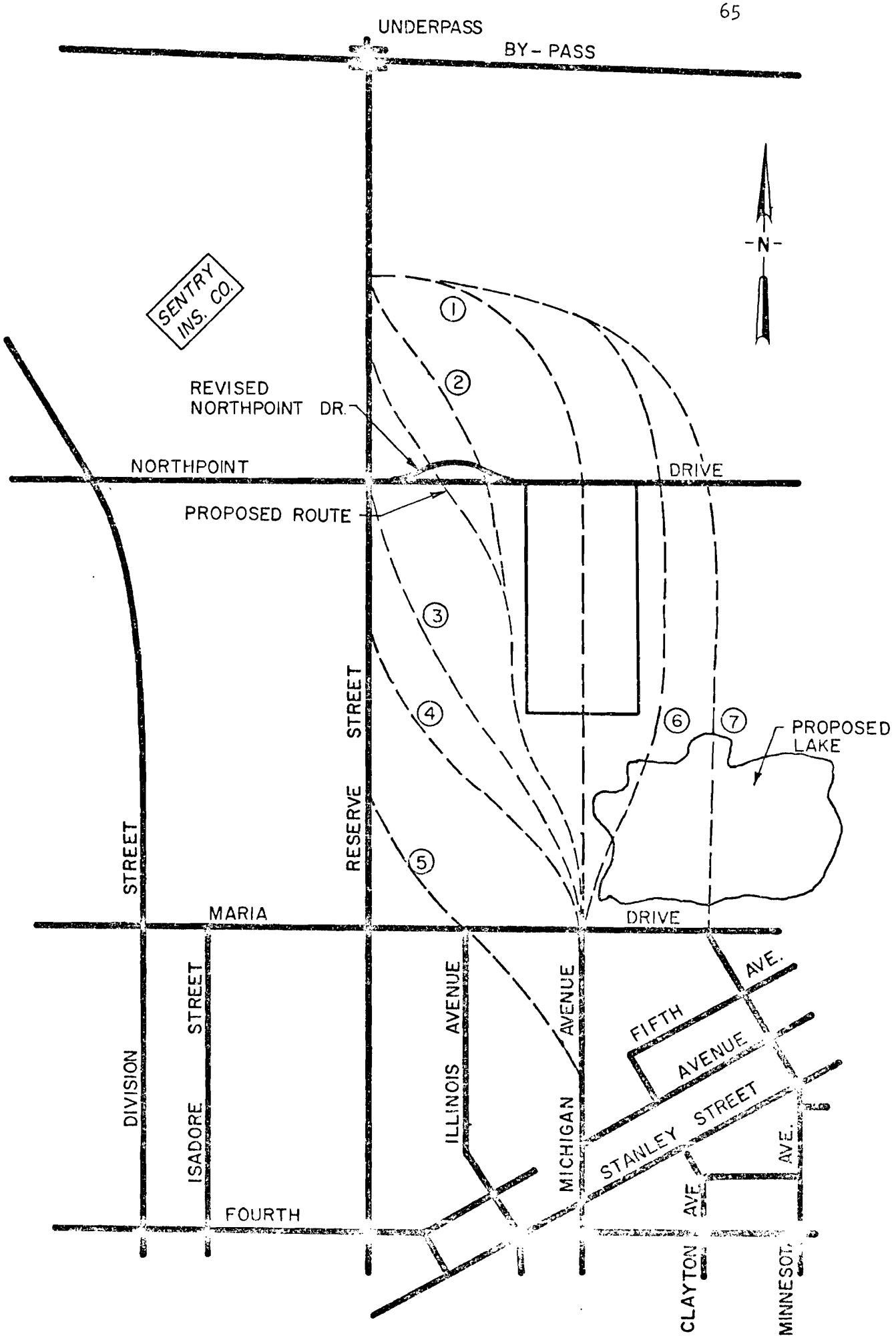

UNDERPASS
BY-PASS
N
SENTRY INS. CO.
REVISED NORTHPOINT DR.
NORTHPOINT
DRIVE
PROPOSED ROUTE
1
2
3
4
5
6
7
PROPOSED LAKE
STREET
RESERVE STREET
MARIA
DRIVE
DIVISION STREET
ISADORE STREET
ILLINOIS AVENUE
MICHIGAN AVENUE
FIFTH AVENUE
STANLEY STREET
AVE.
AVE.
AVE.
FOURTH
CLAYTON
MINNESOT.

FIGURE 6

concluded, although not unanimously, that the proposed route represented a compromise among the suggested alternate routes through the University lands. The proposed right of way is well chosen to minimize environmental and biological impact from road fill or destruction of mature communities.

Route 1 passes through privately owned land zoned commercial and not presently in the City of Stevens Point. This could stimulate undesired commercial development directly adjacent to the natural area. This route is considerably longer than the proposed route and would therefore be more costly to construct. More wetlands would be destroyed, but less mature tree communities would be removed. Route 1 provides a better intersection angle with North Point Drive, but the right angle intersection with Reserve Street does not provide a smooth traffic flow. This route severs a substantial part of the Sentry Insurance property east of Reserve Street.

Route 2 has been suggested as a variation to save the white pine grove just south of North Point Drive. This route is also longer, therefore more expensive to build, and would have severe impact on the drainage pattern where it crosses North Point Drive. It also severs more of the Sentry Insurance lands. The intersection at North Point Drive would be better, but the connection at Reserve Street is too far north to adequately serve the Sentry Insurance complex.

Route 3 was an attempt to utilize the existing intersection of Reserve Street and North Point Drive. This route would destroy more wetlands than the proposed route and would pass through and destroy the large meadow near the center of the 70 acre parcel. This meadow could have some archeological value as it is believed there are Indian artefacts in that meadow. A large stand of mature

pines and hardwoods at the corner of Reserve Street and North Point Drive would be destroyed.

Route 4 would result in the removal of less wooded vegetation than the proposed route. It would require more fill, however, would cross more drainage channels, and would destroy or have serious impact on a substantial part of the wetlands in the area. It would sever more University owned lands, thus having a great impact on their value as arboretum or study areas.

Route 5 would have the least effect on natural areas. It would utilize a large portion of University lands south of Maria Drive which have planned and potential University use. It makes a very difficult 5 point intersection at Maria Drive and Illinois Avenue. Some existing University parking and athletic fields would be lost.

Route 6 would avoid the better biological communities. The route would be substantially more expensive to build because of its length. The severence of land in the Sentry Insurance Company parcel east of Reserve Street would be great. This route would conflict with the proposed campus lake project which is to be located north of Maria Drive.

C. Use Reserve Street and Maria Drive

An upgrading and improvement of existing Reserve Street from Maria Drive to the north, and of existing Maria Drive from Reserve Street to Michigan Avenue is another alternate to the proposed construction. To adequately handle the anticipated traffic, the streets involved would require improvement, estimated

to cost $450,000. The environmental effects of this alternate would be less on the wetlands, but severe on woodland, because mature pines and hardwoods adjacent to the street, both on University land and Sentry Insurance land would have to be removed to construct the streets. This alternate would likely not discourage much traffic from Reserve Street through the campus, and in fact would probably increase the traffic. It would therefore not increase pedestrian safety in the campus area. Air pollution would be increased because flow of traffic would not be as smooth, and vehicle start-stop situations would most likely be introduced at intersections. The intersections at Maria Drive - Michigan Avenue and Maria Drive - Reserve Street would be difficult to design in a manner that would preclude future congestion. The idea of keeping the north campus woodlands contiguous to the main campus for use as an arboretum would be somewhat destroyed, because a major thoroughfare would separate the two.

D. Close Reserve from North Point Drive to Main Street and Force Use of Division

The closing of Reserve Street south of North Point Drive with no new street would satisfy environmental considerations of the natural area, and safety considerations in the campus area. The price in community delay and congestion would be too high, however. Division Street already is at capacity at peak hours. The capacity is determined by the signalized intersections with their delays and turning movements. To widen Division Street would be a very expensive project, would involve more right of way acquisition, with a very great community disruption to existing homes and businesses. Not widening Division Street would force traffic onto other streets which could disrupt presently

quiet residential neighborhoods and cause great concern with noise and traffic. Air pollution would increase because of the congestion and stop-and-go nature of the traffic movement.

E. Extend Minnesota Avenue to the North

Another alternate considered was the extension of Minnesota Avenue to the north, possibly curving to the west to connect to Reserve Street in much the same manner as the proposed Michigan Avenue extension does, shown as Route 7 in Figure 6. Several factors preclude this alternate. First, the proposed campus lake project would be directly in the route of a possible extension of Minnesota Avenue just north of Maria Drive. Also, to make a continuous north-south street through the City would require Minnesota Avenue to cross the Soo Line tracks. This would be substantially more difficult and expensive because there are many more tracks at Minnesota than at Michigan. Minnesota Avenue is also predominately a residential street, but is a newer and more quiet area. The increased traffic would probably create more adverse citizen reaction than that on Michigan Avenue. The use of Minnesota Avenue would require new sets of traffic signals and widening at its intersections with Main Street and Clark Street, and reconstruction of the corner at Clark Street. (Main and Clark are one way streets on which U.S.H. 10 runs.) The use of Minnesota Avenue does not conform to the official City Plan. Minnesota Avenue, if extended, would perhaps damage less prime woodlands and wetlands, but would go through a prime deer herd area.

F. Construct an Interchange at Reserve Street and the U.S.H. 51 Bypass

An alternate considered was to build an interchange at the existing grade

separation structure on U.S.H. 51 Bypass at Reserve Street. Such an interchange would be too close to the one at Division Street and they would mutually interfere with each other. A study of the distribution of the residence locations of Sentry Insurance Company employees in Stevens Point shows this alternate to be unrealistic in terms of serving the traffic needs of these employees. Such a use would require a very circuitous drive which would waste much time and fuel. This alternate still would not accomplish the objective of the Stevens Point official street plan of making Michigan Avenue a north-south artery.

## G. Alternate Methods of Transportation

One other means of transportation which could be considered in place of the automobile is the use of busses. The use busses on a large scale would require a complete change in community attitudes toward mass transportation, and would require large subsidies in order to provide an adequate level of service to attract a sufficient number of passengers. In general, mass transit works effectively only in major metropolitan areas with high population densities, with congestion and parking problems sufficient to force people out of their personal automobiles.

Another alternate is to encourage the use of car pools. This can be done most effectively by major employers, such as Sentry Insurance, offering inducements to their employees to make car pools attractive, and by assisting employees in matching up riders in automobiles. Such an alternate would assist in reducing the initial traffic volume on the proposed new street, but the additional nearby development which is expected around the Sentry Insurance Complex will still require the construction of an improved street corridor in the near future.

## VII. CONCLUSION

During the course of planning this proposed street extension, many public meetings have been held and a number of interested groups have commented on the proposed construction. Some of these groups are:

The University Community Relations

The College of Natural Resources Lands Committee

The University Environmental Awareness Council

The UWSP Biology Department

The UWSP Student Government

Student Chapter of the Wildlife Society

Student Advisory Committee, College of Natural Resources

Some of these groups have submitted written statements of their opinions, which are included as Appendix 7.

Although some environmental opposition remains to the proposed project, the City of Stevens Point, the Portage County Areawide Planning Committee, the UW-Stevens Point Administration, and the University of Wisconsin Central Administration have all agreed that the proposed corridor represents an acceptable route with the least environmental harm.

It is the conclusion of this report that the proposed route will best satisfy the traffic demands, safety considerations and minimize the environmental harm.

Recommendations

That Michigan Avenue be extended along the proposed route with the following precautions and actions taken in order to minimize the environmental harm:

1. All construction work be confined to the right of way width.
2. During final design consider a variable grade to minimize the road fill.
3. Accommodate lateral surface drainage by use of culverts.
4. Posting and enforcement of low speed limits.
5. The City consider possible restriction of truck traffic to reduce noise.
6. Temporary fencing (during construction) or other means to protect vulnerable plant communities along the right of way.
7. No clearing of obstacles to vision lines of sight across curves.
8. Minimize street lighting to reduce impace on light sensitive animals and photo-periodic plants.
9. Restore Reserve Street to a pedestrian and bicycle path, maintaining only access for service vehicles.
10. Reestablish wetland access across Reserve Street between Maria Drive and North Point Drive to minimize environmental harm.
11. New culverts have natural guard rail and headwall facings. (Use of wood and stone.)

The proposed route is recommended because it is the best compromise biologically, causes the least severance damage to properties, provides a street facility which will accommodate the expected future traffic, and is in general conformance with established official City plan. The construction of the proposed street will permit the vacation of Reserve Street and increased safety to pedestrians in the campus area.

# BIBLIOGRAPHY

The Geography of Wisconsin, R. W. Finley

College Printing & Typing Co., Madison, 1965

1973 Air Quality Data Report, State of Wisconsin,

Department of Natural Resources

Effects of Irrigation on Streamflow in the Central Sand Plain of Wisconsin,

E. P. Weeks & H. G. Stangland

U.S. Geological Survey, Water Resources Division 1971

The Vegetation of Wisconsin, John T. Curtis

The University of Wisconsin Press, Madison 1959

Journal of the Environmental Engineering Division, ASCE

April 1974, p. 459 "Water Pollution & Associated Effects from

Street Salting."

Highway Noise

National Cooperative Highway Research Program Report 117

Procedure for Estimating Highway User Costs, Air Pollution, and Noise Effects

National Cooperative Highway Research Program Report 133

Geology and Water Resources of Portage County Wisconsin

Geological Survey Water-Supply Paper 1796

U.S. Government Printing Office, Washington 1965

Long Range Development Plan for Wisconsin State University - Stevens Point

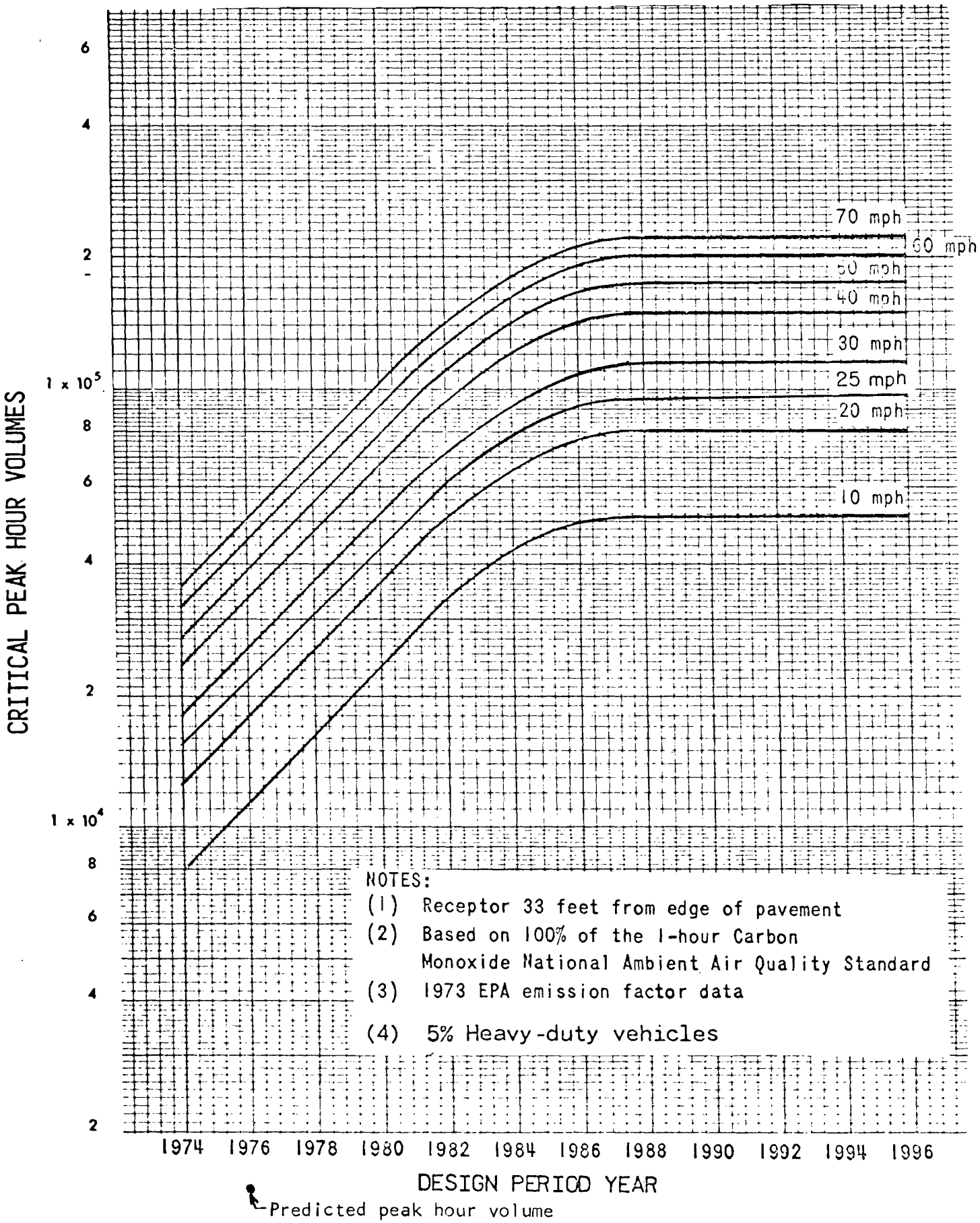
Daverman Associates, Inc., Grand Rapids, Michigan, 1968

V. EVALUATION SECTION:

| EFFECTS<br>Changes to or Results in: | YES | NO | Positive | Negative | Magnitude | | | Comments (Add additional pages if necessary |
|---|---|---|---|---|---|---|---|---|
| | | | | | Some | Major | Un-Known | |
| A. Campus Plan | X | | X | | | | | |
| B. Community Plan | | X | | | | | | |
| C. Regional Plans | | X | | | | | | |
| D. Land Use (Zoning) | | X | | | | | | |
| E. Urban Development Encouraged Requiring Additional Service Expenditures | | X | | | | | | |
| F. Vehicular Traffic Patterns/Services | X | | X | | | | | |
| G. People Traffic Patterns | | | | | | | | |
| H. Archeological, Historic, Scientific or Other Unique Sites | | X | | | | | | |
| I. Unique Environmental Land Forms or Sites | | X | | | | | | |
| J. Water Quality/Supply, i.e., Lakes, Rivers, Marshes | X | | | X | X | | | Slight effect from salt runoff and other products deposited by vehicles |
| K. Air Quality and Pollution | X | | | X | X | | | Air quality degradation will occur regardless, because of increased traffic |
| L. Energy Requirements | X | | | X | X | | | |
| M. Erosion or Siltation Except Temporary Effects during Construction Period | | X | | | | | | |
| N. Temporary Erosion during Construction | X | | | X | X | | | Proper construction technique can minimize |
| O. Plant or Animal Life | X | | | X | X | | | |
| P. Health Hazard | | X | | | | | | |

| EFFECTS<br>Changes to or Results in: | YES | NO | Positive | Negative | Magnitude | | | Comments (Add additional pages if necess |
|---|---|---|---|---|---|---|---|---|
| | | | | | Some | Major | Un-Known | |
| Q. Mineral and Fuel Use | X | | | X | X | | | |
| R. Services, i.e., Sewer, Water, Electric Communications, Police, Fire | | X | | | | | | |
| S. Local Economy | X | | X | | X | | | |
| T. Social Impact | X | | X | | | X | | helps pedestrian safety in UWSP campus area |
| U. Aesthetics and Visual Effects | X | | X | | | | | |
| V. Transporation, i.e., Parking, Transit, Bicycle | X | | X | | | | | |
| W. Effect on Public Use | X | | X | | | | | |
| X. Noise Except Temporary during Construction | X | | | X | X | | | |
| Y. Odor Except Temporary during Construction | | X | | | | | | |
| Z. Potential for Resolving Conflicts | X | | X | | | | | Reduce conflict between vehicles and pedestrians |
| * Miscellaneous (add items that may aid in evaluation | | | | | | | | |

ENVIRONMENTAL CAPACITY CURVE
CARBON MONOXIDE



# APPENDIX 2
# SALT POLLUTION

Assumptions:

1. An average of 4 storms per month requiring salt application during the months of November, December, January, February, March. (Total of 20 applications.)

2. An average application rate of 500 pounds of salt per lane mile (500 X 20 = 10,000 lbs. per lane mile).

3. All water runs off due to frozen ground.

4. All salt is dissolved and enters the water course in March.

5. Average annual precipitation (water equivalent) is: November 2.1 inches; December 1.25 inches; January 1.3 inches; February 1.2 inches; March 1.7 inches for a total of 7.55 inches.

6. Length of new street is 0.7 miles (0.7 X 4 = 2.8 lane miles).

7. Drainage area is 160 acres, or 0.25 square miles.

Example:

$$\frac{\text{Tons salt per lane mile X no. of lane miles}}{\text{Inches runoff X drainage area in sq. miles}} \times \text{conversion factor} = \text{ppm from roadway}$$

$$\frac{5 \times 2.8}{7.55 \times 0.25} \times 8.33 = 62 \text{ ppm chlorides}$$

Maximum tolerable levels - chloride

| | |
|---|---|
| Animals | 2000 ppm |
| Plants | 1000 ppm |
| Human | |
| health | 250 ppm |
| taste | 100 ppm |

# Appendix 3

All sound level measurements were taken and analyzed by Donald E. Baxa of Diversified Dynamics, 6242 University Avenue, Middleton, Wisconsin 53562. The following instruments were used for the measurement, recording, and analysis of the data:

| | |
|---|---|
| B & K Sound Level Meter | model 2209 |
| B & K Sound Level Calibrator | model 4230 |
| B & K 1 Inch Microphone | model 4144 |
| B & K Graphic Level Recorder | model 2305 |
| UHER Portable Tape Recorder | model 4000IC |

Measurements were taken in Stevens Point, Wisconsin on Tuesday, November 5, 1974 at the locations and times listed below and shown in Figure 1.

Location #1: 100 feet east of the near lane center line of Michigan Avenue
155 feet south of the near curb line of Sims Avenue
between 7:30-8:05 a.m.

Location #2: 100 feet east of the near lane center line of Reserve Street North
100 feet north of the near lane center line of Marla Drive
between 9:00-9:15 a.m.

Location #3: In the Arboretum at Station 36
between 10:00-10:15 a.m.

Location #4: In the Arboretum at Station 20
between 1:00-1:15 p.m.

Location #5: 100 feet west of the near lane center line of Michigan Avenue
Directly across from the entrance to the Village Apartments
between 4:30-5:10 p.m.

At these locations, the microphone was mounted on a tripod 3.5 feet above ground level. Although wind was negligible, a wind screen was mounted over the microphone. The microphone electrical signal was amplified and "A" scale weighted by the sound level meter. A shielded cable connected the AC output of the sound level meter to the tape recorder input. A recording speed of 9.5 cm/sec was used for all recordings. The recordings were calibrated using the sound level calibrator. All scale settings were noted for future playback reference.

The tape record was then taken back to the laboratory and played into a graphic level recorder using a paper speed of 3 mm/sec and a pen writing speed of 25 mm/sec. This corresponds closely to a Slow meter response. During graphic recording, a 50 dB dynamic range potentiometer was used. The signal was rms detected. Accuracy of the graphic levels were within 1 dB of known recorded values.

Once the time vs level graphic recordings were made, samples were taken at intervals of 1.67 secs. All sampled levels were rounded to the nearest 0.5 dBA. For locations #1-4, 400 samples were taken. For location #5, 1200 samples were taken. From these samples, cumulative probability density values were obtained and plotted (See Fig. 2-6). A summary table was created indicating $L_{10}$, $L_{50}$, $L_{90}$ and $L_{EQ}$ levels (See Table 1). The $L_{EQ}$ was obtained by using the following equation:

$$L_{EQ} = L_{50} + \frac{(L_{10} - L_{90})^2}{60} \qquad \text{Equation 1}$$

All values listed in this table are within $\pm$ 2 dBA accuracy level.

Table 1. $L_N$ values at designated locations (dBA).

| Location* | $L_{90}$ | $L_{50}$ | $L_{10}$ | $L_{EQ}$ |
|---|---|---|---|---|
| #1 | 57.5 | 59.5 | 66.5 | 61.0 |
| #2 | 47.5 | 50.5 | 61.0 | 53.5 |
| #3 | 50.0 | 52.5 | 54.5 | 53.5 |
| #4 | 41.0 | 43.0 | 46.0 | 43.5 |
| #5 | 46.0 | 50.0 | 58.5 | 52.5 |

* #1: 900 automobiles/hr, 5 trucks/hr

#2: Level raised by construction truck traffic

#3: Background level comprised of construction noise from the Sentry Insurance building site

#4: Although, having a lesser noisc level effect than at location #3, construction noise could still be heard

#5: Under 200 automobiles/hr

FIGURE 7

PAGE 82

CUMULATIVE PROBABILITY DENSITY VERSUS SOUND PRESSURE LEVEL AT LOCATION NO. 1

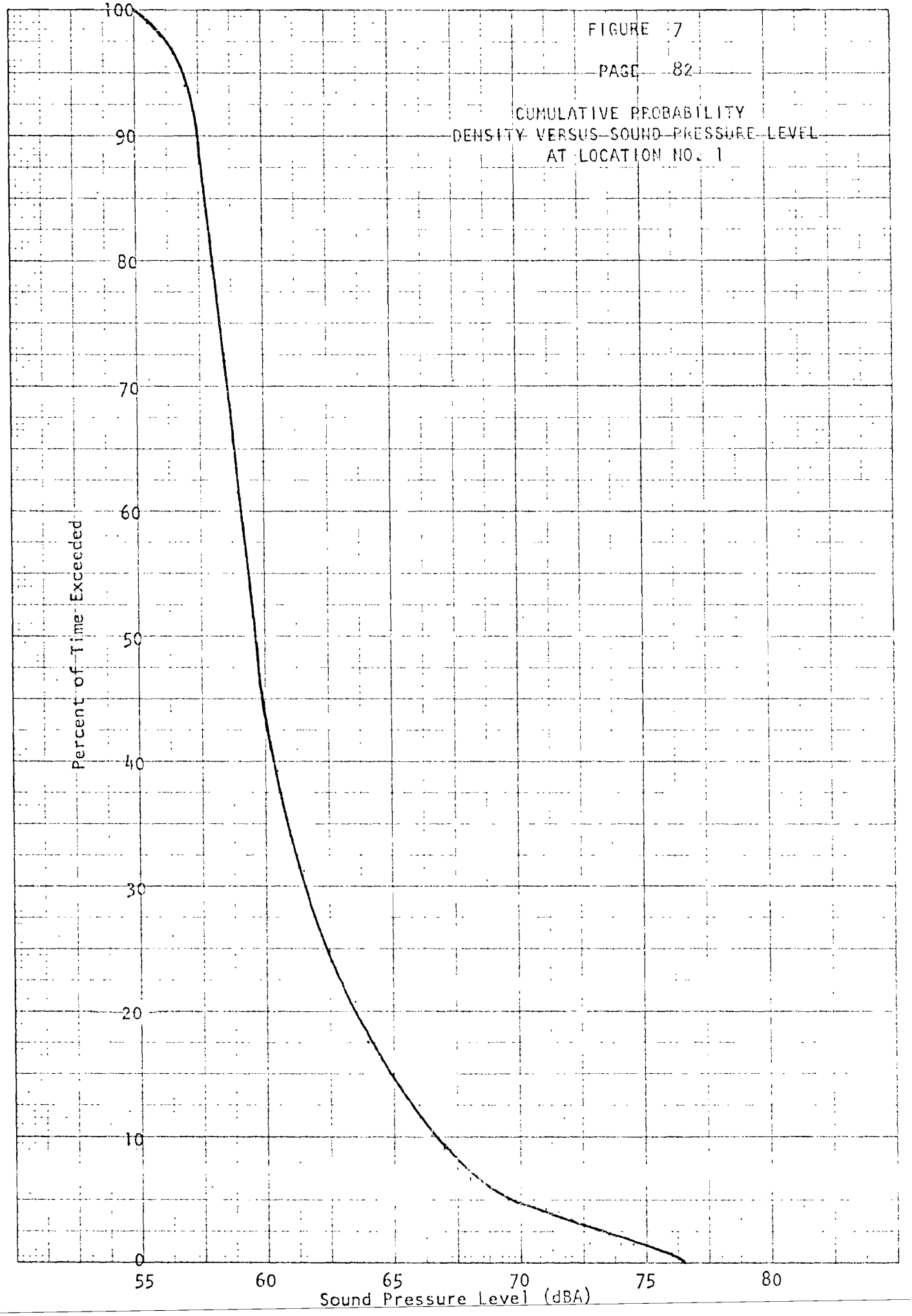


FIGURE 8

PAGE 83

CUMULATIVE PROBABILITY DENSITY VERSUS SOUND PRESSURE LEVEL AT LOCATION NO. 2

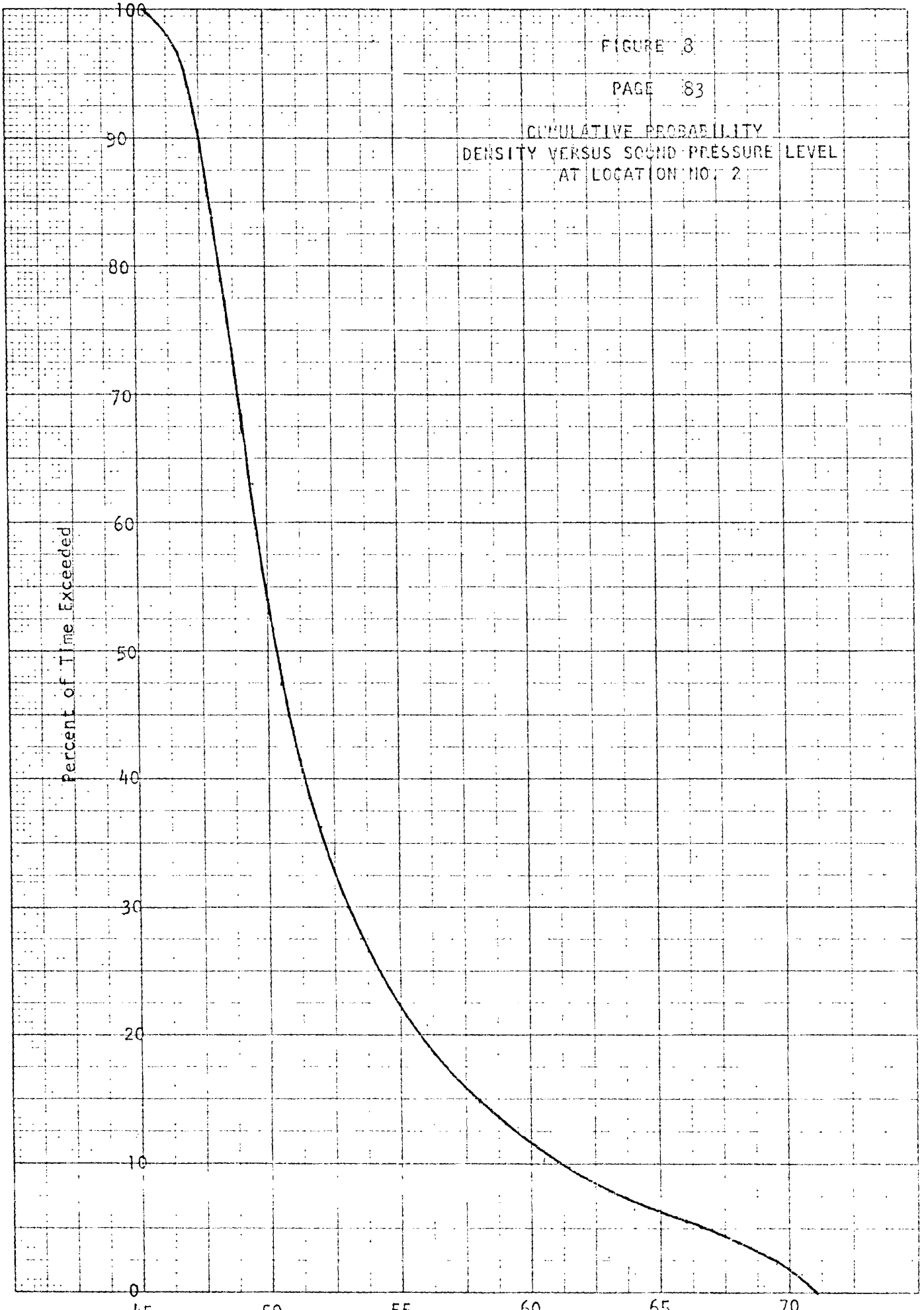


FIGURE 9

PAGE 84

CUMULATIVE PROBABILITY DENSITY VERSUS SOUND PRESSURE LEVEL AT LOCATION NO. 3

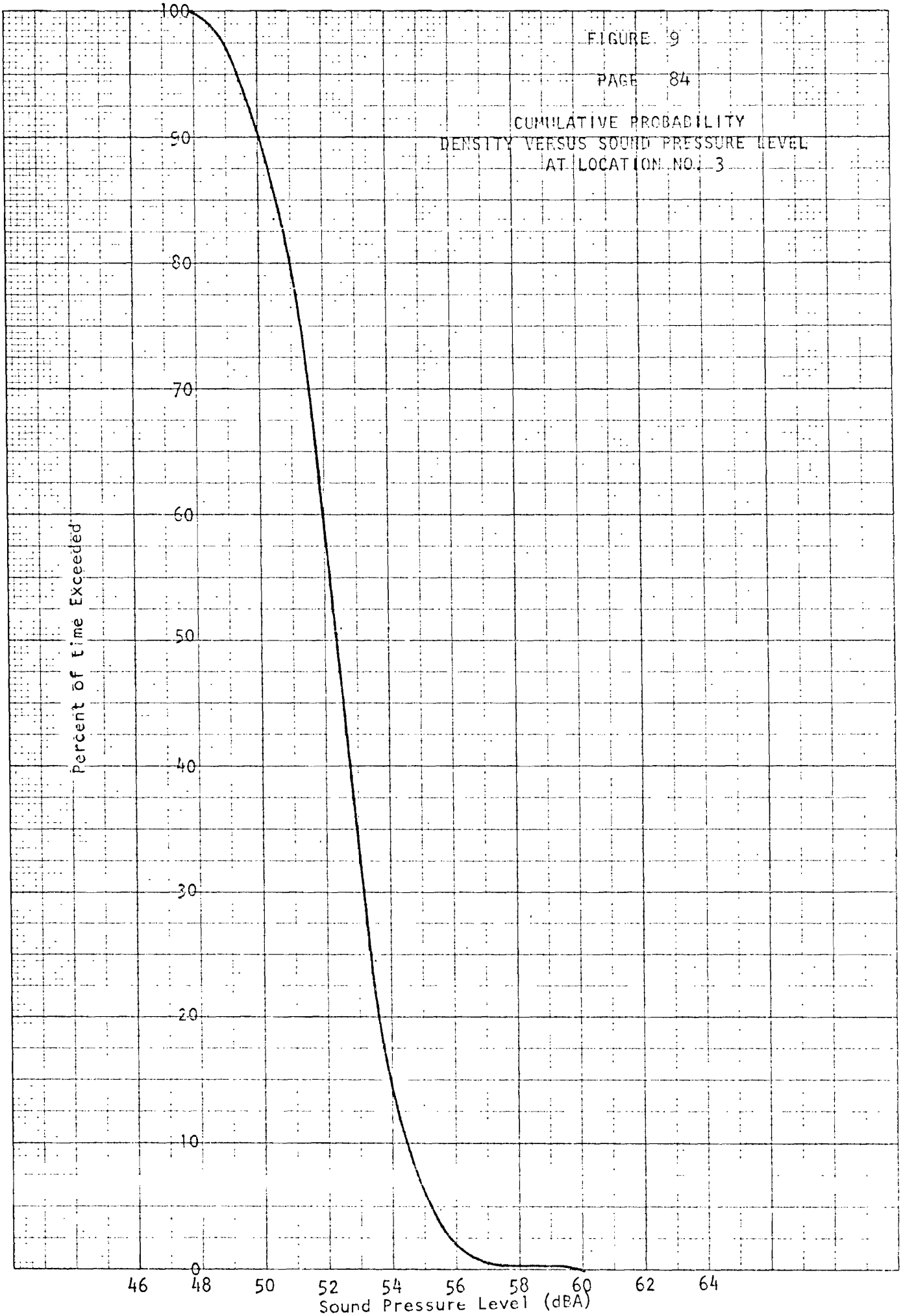


FIGURE 10

PAGE 85

CUMULATIVE PROBABILITY
DENSITY VERSUS SOUND PRESSURE LEVEL
LOCATION NO. 4

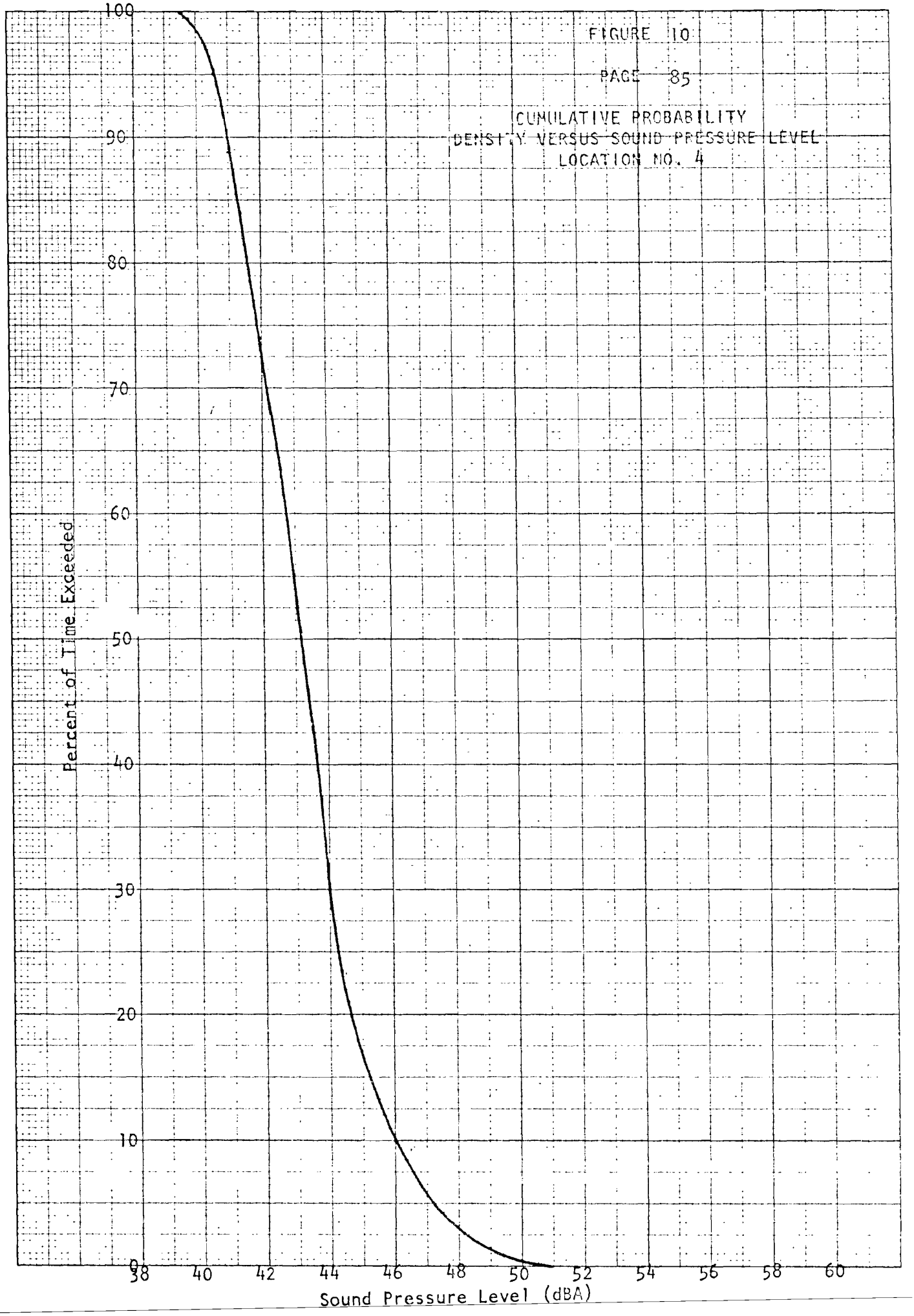
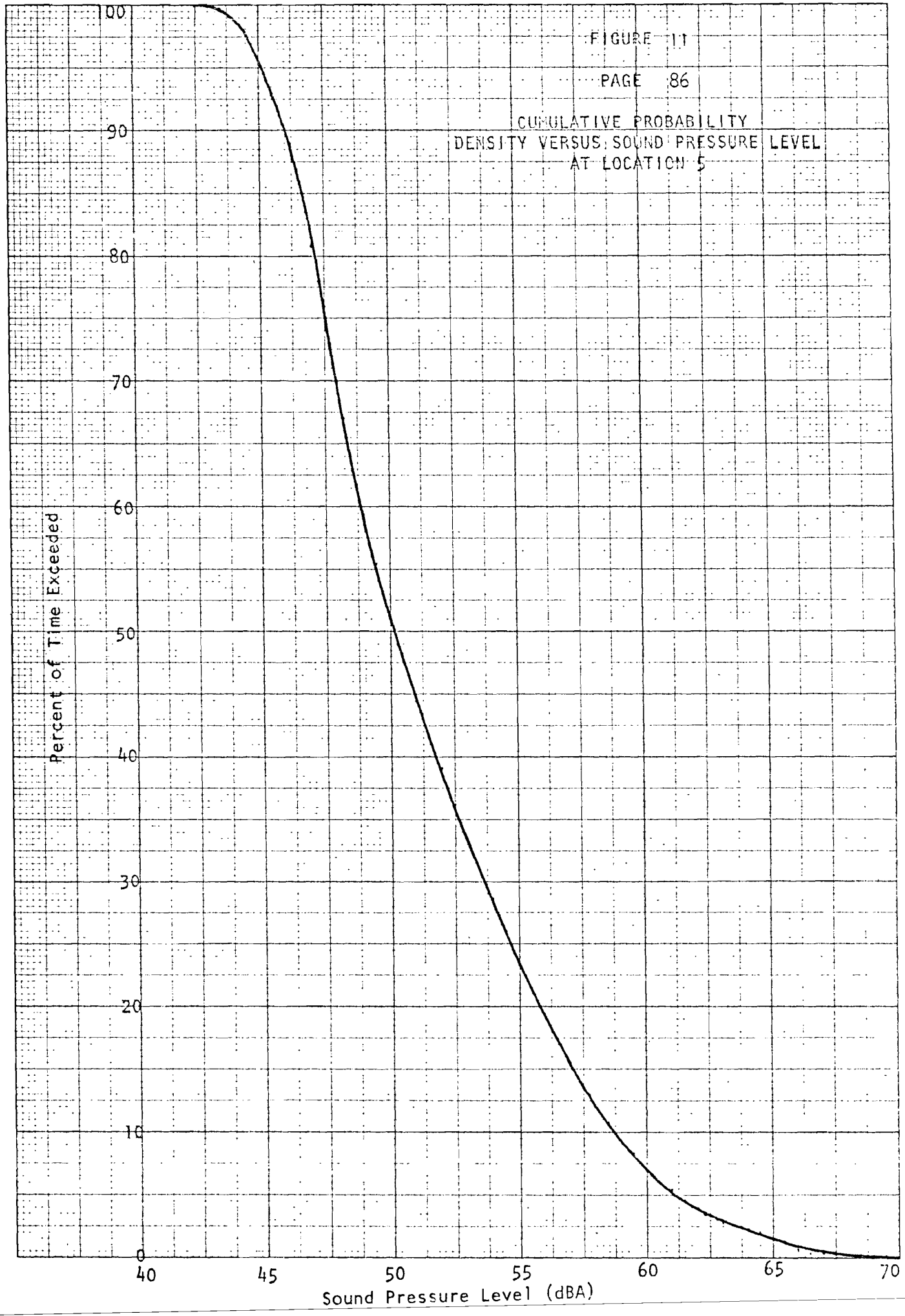


FIGURE 11

PAGE 86

CUMULATIVE PROBABILITY DENSITY VERSUS SOUND PRESSURE LEVEL AT LOCATION 5



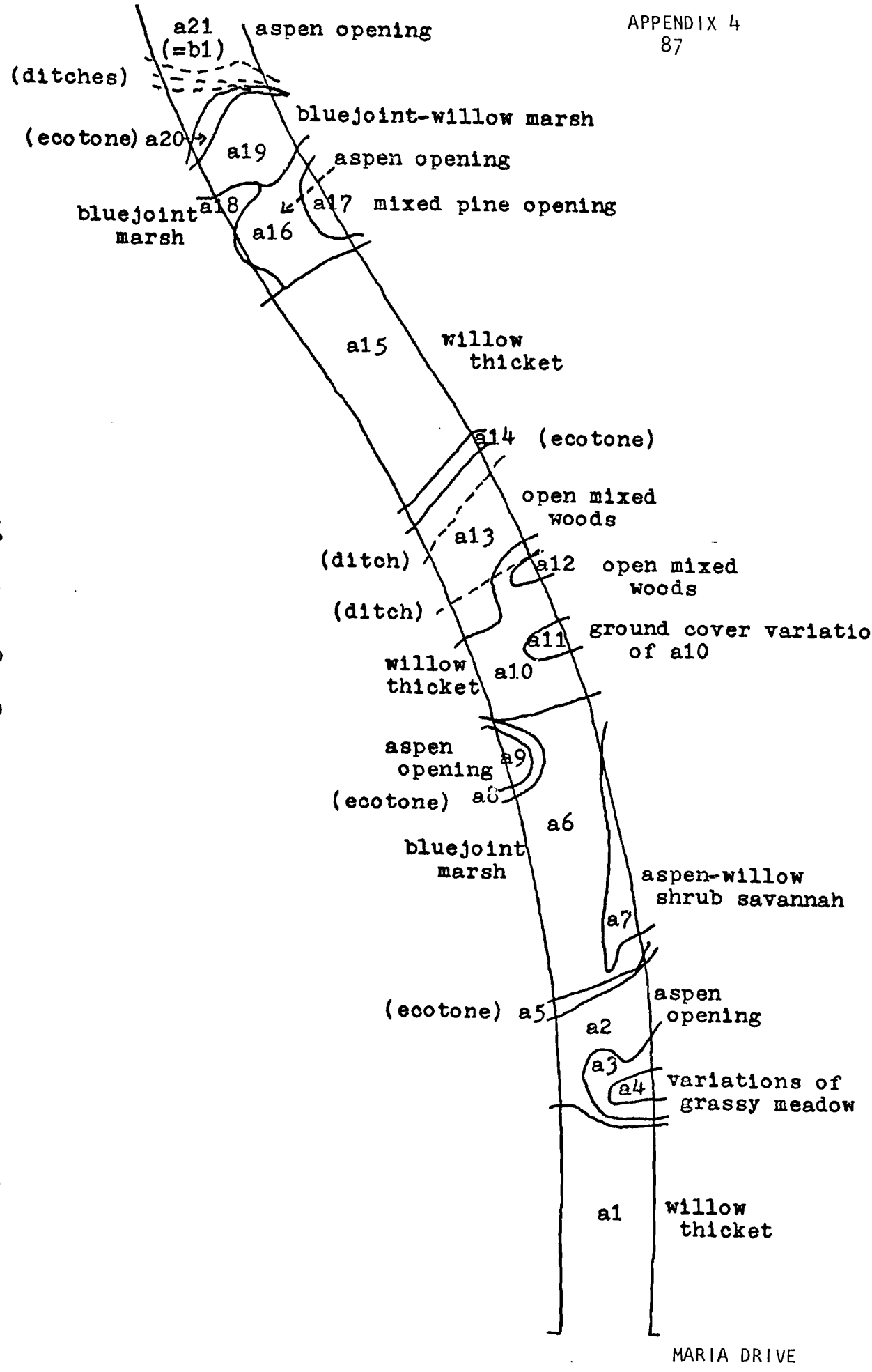



Fig. 8a. PLANT COMMUNITIES, PROPOSED MICHIGAN AVENUE EXTENSION, FALL 1974.
0 to 1,000 Feet North of Maria Drive along Right of Way.

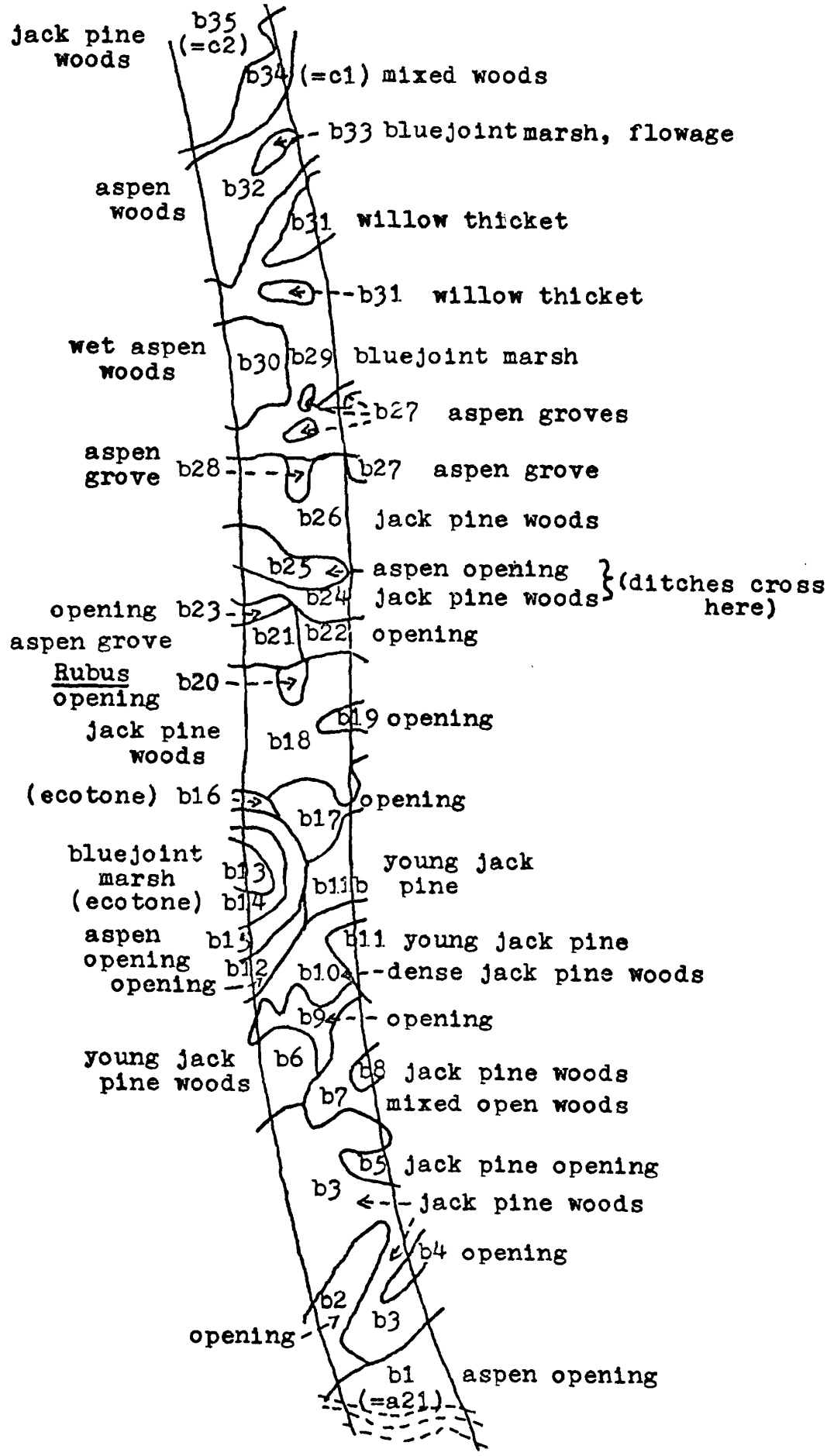



Fig. 8b. PLANT COMMUNITIES, PROPOSED MICHIGAN AVENUE EXTENSION, FALL 1974.
1,000 to 1,900 Feet North of Maria Drive along Right of Way.

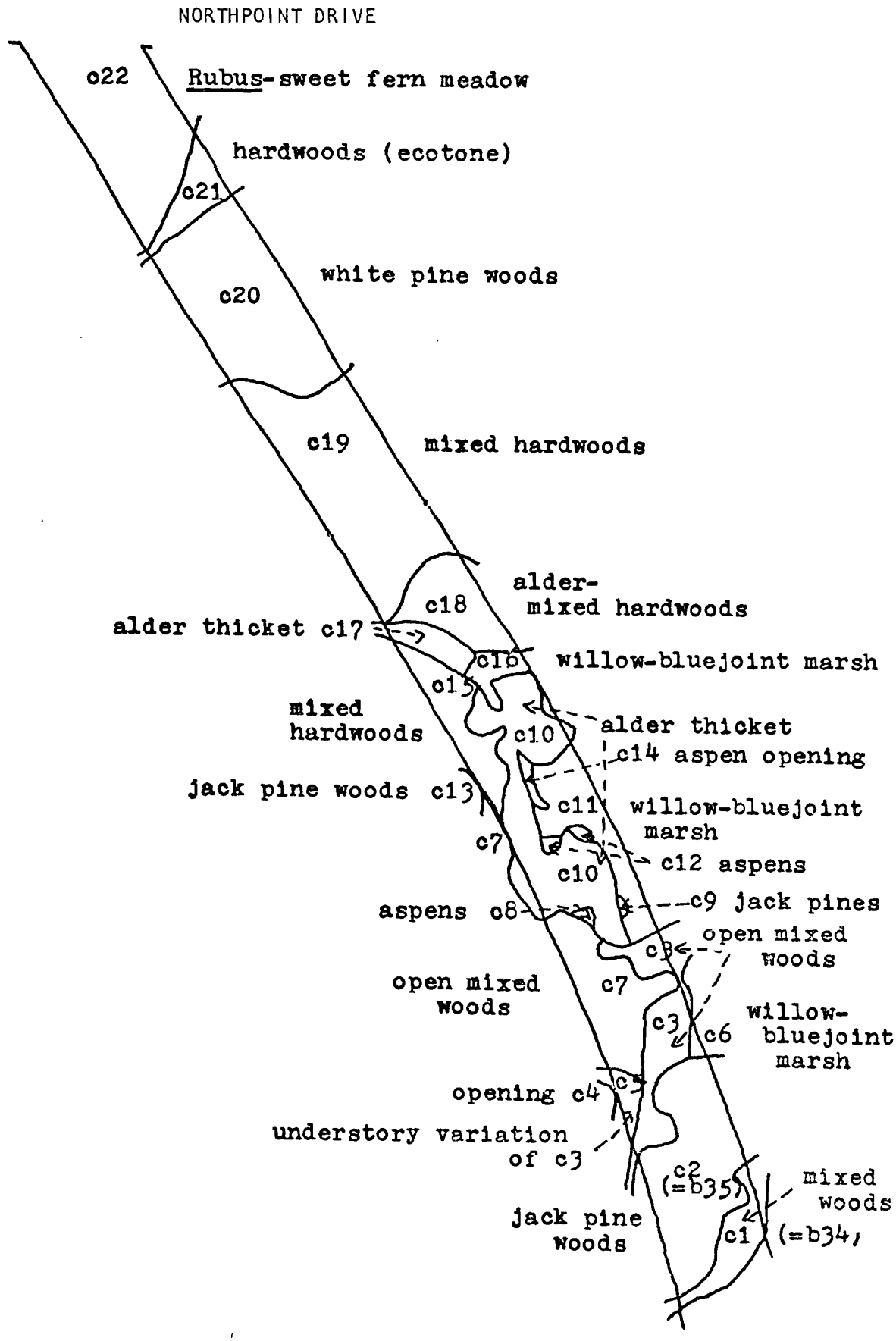



Fig. 8c. PLANT COMMUNITIES, PROPOSED MICHIGAN AVENUE EXTENSION, FALL 1974
1,850 to 2,800 Feet North of Maria Drive along Right of Way.

Appendix 4A. Composition of plant communities along proposed right of way for Michigan Avenue extension.

Listings are of species conspicuous, or at least identifiable in late September and October of the dryest fall in 20 years. Voucher collections are on file at the herbarium at the University of Wisconsin-Stevens Point.

Several of the following species represent members of taxonomically difficult species pairs or species complexes. It has been beyond the scope of this survey to classify them very precisely, or to provide voucher specimens community by community. Notably, Rubus hispidus may sometimes refer to Rubus strigosus or Rubus flagellaris; Solidago canadensis may refer to Solidago altissima; Fragaria vesca may include a majority of Fragaria virginiana, though none was collected; and the Salix species have not been pursued extensively.

Format: Community location, general community type, qualifications. Italics omitted in species names. Tree-size individuals listed in capital letters. Numbers indicate typical size range, in inches diameter 4½ feet above the ground.

+++ = abundant
++ = scattered
+ = present, but rare

a1. Willow thicket.
Salix amygdaloides +++
POPULUS TREMULOIDES + 2-3
PINUS STROBUS + 3
Rubus sp. ++
Spiraea alba +
Spiraea tomentosa +
Salix discolor +
Solidago gigantea +, locally ++
Solidago canadensis ++, locally +++
Solidago graminifolia +
Aster tradescanti +
Aster umbellatus +
Calamagrostis canadensis +, locally ++
Glyceria canadensis +
Scirpus cyperinus +
Lycopus virginicus +
Rubus hispidus ++
Potentilla simplex +
Panicum lanuginosum +
Galium sp. +
Onoclea sensibilis +++ locally
Polytrichum sp. +, locally ++

a2. Aspen opening.
POPULUS TREMULOIDES ++ 1-3, locally +++
BETULA PAPYRIFERA + 3-5
Salix amygdaloides +
Spiraea alba +, +++ in shady places
Spiraea tomentosa +++
Rubus sp. ++
Solidago canadensis +++
Solidago gigantea +
Aster umbellatus ++
Rubus hispidus +++
Potentilla simplex +++
Onoclea sensibilis ++ locally
Polytrichum sp. +++

a3. Danthonia meadow, moist fringe.
Danthonia spicata +++
Rubus sp. ++
Spiraea tomentosa ++
Populus tremuloides seedlings ++
Quercus rubra seedlings +
Ilex verticellata (?) seedlings +
Solidago canadensis +++
Achillea millefolium +
Poa pratensis ++
Carex sp. +
Rubus hispidus +++
Potentilla simplex +
Polytrichum sp. +++

a4. Danthonia meadow, dry center.
Danthonia spicata +++
Polytrichum sp. +++
Spiraea tomentosa ++
Rubus hispidus ++
Solidago canadensis +

a5. Ecotone between a2 and a6.

a6. Bluejoint marsh.
Calamagrostis canadensis +++
Scirpus cyperinus ++, locally +++
Glyceria canadensis ++, locally +++
Spiraea tomentosa ++, locally +++
Spiraea alba ++
POPULUS TREMULOIDES + 1-3, locally ++, many dead
Solidago gigantea ++
Rosa sp. +
Salix amygdaloides +

a7. Aspen-willow/savannah. shrub-
POPULUS TREMULOIDES ++ 1-3
Salix amygdaloides +++
Spiraea tomentosa ++
Spiraea alba ++
Solidago canadensis +++
Solidago gigantea +
Salix discolor +
Rubus hispidus +
Onoclea sensibilis +++ locally
Dryopteris cristata +
Dryopteris strigosus +

a8. Ecotone between a6 and a9.

a9. Aspen opening.
POPULUS TREMULOIDES ++ to +++ 1-4
BETULA PAPYRIFERA + 4
Salix amygdaloides +
Spiraea tomentosa +++
Spiraea alba +
Glyceria canadensis ++
Calamagrostis canadensis ++
PINUS STROBUS +
Scirpus cyperinus ++

a10. Willow thicket
Salix amygdaloides +++
Scirpus cyperinus +++
Solidago canadensis +

a11. Understory variation of a10. Same species plus:
Spiraea tomentosa +++
Spiraea alba ++
Salix discolor +
Solidago gigantaea +

a12. Open mixed woods. See a13.

a13. Open mixed woods.
POPULUS TREMULOIDES ++, locally +++, locally + 2-6
PINUS BANKSIANA ++ 3-8
BETULA PAPYRIFERA + 5
PINUS STROBUS + 1-5
Salix amygdaloides ++ to +++
Salix discolor ++
Solidago canadensis +++
Spiraea tomentosa +++
Rubus sp. +++
Rubus hispidus +++
Solidago gigantea ++
Scirpus cyperinus ++
Calamagrostis canadensis +
Glyceria canadensis +, locally ++
Aster lateriflorus +
Potentilla simplex +
Polytrichum sp. ++
Polytrichum sp. 2 ++
Polygonum scandens +

a14. Ecotone between a13 and a15.
Characterized by no willows, dead Populus tremuloides, and especially abundant Spiraea tomentosa (+++).

a15. Willow thicket.
Essentially no living Populus tremuloides.
Salix amygdaloides +++
Scirpus cyperinus +++
Spiraea alba +, locally ++
Glyceria canadensis +, locally ++
Rorippa islandica +
Ludwigia palustris +, locally ++
Ludwigia alternifolia +
Veronica americana +
Veronica sp. +
Eleocharis acicularis +
Galium sp. +

a16. Aspen opening.
POPULUS TREMULOIDES ++ 1-3, some dead
BETULA PAPYRIFERA + 2
PINUS BANKSIANA + 3-5
Salix discolor ++
Salix amygdaloides +
Solidago canadensis ++
Solidago gigantea ++
Spiraea tomentosa ++
Spiraea alba ++
Glyceria canadensis +

Onoclea sensibilis +

a17. Open mixed pine.
PINUS BANKSIANA + 3-6
PINUS STROBUS + 3
BETULA PAPYRIFERA + 4
Rubus sp. +++
Rubus hispidus +++
Solidago canadensis +++
Potentilla simplex ++

a18. Bluejoint-bulrush-manna grass marsh.
Calamagrostis canadensis +++
Glyceria canadensis +++
Scirpus cyperinus +++
Spiraea tomentosa ++

POPULUS TREMULOIDES + 2-4, many dead
Spiraea alba +
Salix amygdaloides +
Aster lateriflorus +
Carex sp. +

a19. Bluejoint-willow marsh.
Calamagrostis canadensis +++
Salix amygdaloides ++
Salix discolor ++
Solidago gigantea ++
Scirpus cyperinus +, locally +++
Glyceria canadensis +, locally ++
Spiraea alba +, locally ++
Aster simplex +
Polygonum sagittatum +

a20. Ecotone between a19 and a21 (=B1)
Calamagrostis canadensis +++
Carex sp. +++
Onoclea sensibilis ++, locally +++
Solidago gigantea ++
Spiraea alba ++
Spiraea tomentosa +
Solidago canadensis +
Glyceria canadensis +

b1. a21. Aspen opening.
POPULUS TREMULOIDES ++, locally +++ 1-3, occasionally 4
BETULA PAPYRIFERA + 4
Salix sp. +
Salix amygdaloides +, locally ++
Spiraea tomentosa ++, locally +++
Solidago canadensis +++
Solidago gigantea +++
Rubus hispidus +++
Scirpus cyperinus ++
Onoclea sensibilis +
Aster lateriflorus +
Polytrichum sp. +++

B2. Opening, jack pine habitat.
Species composition essentially like B3 without trees.

B3. Jack pine woods.
PINUS BANKSIANA +++ 1-5
Comptonia peregrina +++
Rubus hispidus +++
Rubus sp. +
Spiraea tomentosa +++
Potentilla simplex ++
unknown grass ++, locally +++
Galium sp. +, locally ++
Populus tremuloides seedlings +
Aster tradescanti +, locally ++
Carex sp. +
Polytrichum sp. +++

In deepest woods, understory attentuates to:
Rubus sp. +
Solidago gigantea +
Solidago canadensis +
Aster lateriflorus +
Quercus rubra seedlings +

B4. Opening, jack pine habitat.
Species composition essentially like B3 without trees.

B5. Opening, jack pine habitat.
Species composition essentially like B3 without trees.

B6. Young jack pine woods.
PINUS BANKSIANA ++ under 1", up to 10' tall
Comptonia perigrina ++
Potentilla simplex +++
Spiraea tomentosa ++
unknown grass ++
Polytrichum sp. +++

B7. Aspen-jack pine opening.
POPULUS TREMULOIDES +, locally ++ under 1"
PINUS BANKSIANA + 5-7
Salix amygdaloides +
Vaccinium angustifolium +
Rubus sp. ++
Spiraea alba +
Spiraea tomentosa +
Aster tradescanti +
Comptonia peregrina +
Solidago canadensis ++
Rubus hispidus +++
Potentilla simplex +++
Polytrichum sp. +++

b8. Jack pine woods. Species composition similar to b3.

b9. Opening, jack pine-aspen habitat.
Spiraea tomentosa +++
Rubus hispidus +++
Potentilla tridentata ++, locally +++
Comptonia peregrina ++
Fragaria vesca ++
Solidago canadensis ++
Rubus sp. ++
Potentilla simplex +, locally +++
Pinus banksiana seedlings +
Populus tremuloides seedlings +
Salix amygdaloides +
Calamagrostis canadensis +
Carex sp. +
Polytrichum sp. +++

b10. Dense jack pine woods. Heavy needle cover on floor.
PINUS BANKSIANA +++ 1-5
Spiraea tomentosa +++
Rubus hispidus +++
Potentilla simplex ++
Calamagrostis canadensis +, +++ on north edge
Spiraea alba +
Rubus sp. +
Quercus rubra seedlings +
Polytrichum sp. +++

b11a. Jack pine, young. Recent colonization of burn.
PINUS BANKSIANA +++ ½-2, 8 or 9 feet tall.
Potentilla simplex +++
Spiraea tomentosa ++
Solidago graminifolia ++
Rubus sp. ++
Rubus hispidus + to ++
Polytrichum sp. +++

b11b. Jack pine, young. Recent colonization of burn.
Species composition similar to b11a.

b12. Opening, jack pine-aspen habitat.
Rubus sp. +++
Spiraea tomentosa +++
Solidago canadensis ++, locally +++
Pinus banksiana seedlings +
Populus tremuloides sprouts +
Pinus strobus seedlings +
Salix amygdaloides +
Carex sp. +
Rubus hispidus +
Polytrichum sp. ++

b13. Bluejoint marsh
Calamagrostis canadensis +++
Scirpus cyperinus ++
Solidago gigantea ++
Salix amygdaloides +

b14. Willow ecotone.
Salix amygdaloides ++ to +++
Calamagrostis canadensis +++
Solidago gigantea ++
Solidago canadensis +
Spiraea tomentosa +
Aster tradescanti ++
Populus tremuloides sprouts +
Sphagnum sp. +

b15. Aspen ecotone.
POPULUS TREMULOIDES +++ ½-2
Salix amygdaloides +
Calamagrostis canadensis +++
Solidago gigantea ++
Solidago canadensis +

b16. Additional ecotone between b15 and b17, b18.

b17. Opening, jack pine habitat.
Comptonia peregrina ++
Spiraea tomentosa ++
Rubus sp. ++
Solidago graminifolia ++
Solidago canadensis ++
unknown grass ++ to +++
Rubus hispidus +++
Pinus banksiana seedlings +

b18. Jack pine woods.

Rubus sp. +++
Comptonia peregrina +
Spiraea tomentosa ++, locally +++
Rubus hispidus +++
Potentilla simplex ++
Fragaria vesca +

b19. Opening, species composition similar to b17.

b20. Rubus dominated opening.
Rubus sp. +++
QUERCUS ELLIPSOIDALIS + 5
Carex sp. +
Rubus hispidus +
Pinus banksiana seedlings +
Achillea millefolium +
Polytrichum sp. +++

b21. Aspen grove.
POPULUS TREMULOIDES +++ ½-1
Rubus sp. +++
Solidago canadensis +
Rosa sp. +
Rubus hispidus +++
Polytrichum sp. +++

b22. Opening, jack pine habitat. Species composition similar to b17 and b19.

b23. Opening, aspen habitat.
Calamagrostis canadensis +++
Solidago canadensis ++
Rubus sp. +
Salix amygdaloides +

b24. Jack pine woods, species composition similar to b26.

b25. Aspen opening.
POPULUS TREMULOIDES ++, + to east 2-4
Spiraea tomentosa ++
Solidago canadensis +
Rubus hispidus +++
Fragaria vesca ++
Potentilla simplex ++
Polytrichum sp. ++

b26. Jack pine woods.
PINUS BANKSIANA +++ 1½-5, one 11
Vaccinium angustifolium +
Spiraea tomentosa +, locally ++
Comptonia peregrina +
Quercus rubra seedlings +
Rubus hispidus +++
Fragaria vesca ++
Potentilla simplex +
Polytrichum sp. +

b27. Aspen groves.
POPULUS TREMULOIDES +++ 1-4
Calamagrostis canadensis +++
Spiraea tomentosa +++
Solidago canadensis ++
Rubus hispidus +
Spiraea alba +

b28. Aspen grove.
POPULUS TREMULOIDES +++ ½-4
Spiraea tomentosa +++
Rubus hispidus +++
Polytrichum sp. +

b29. Bluejoint marsh.
Calamagrostis canadensis +++
POPULUS TREMULOIDES + 1-5
Spiraea alba ++
Spiraea tomentosa ++
Solidago canadensis ++
Solidago gigantea +
Carex sp. +
Aster umbellatus +
Aster tradescanti +
Galeopsis tetrahit+
Iris versicolor +++ along flowages only

b30. Wet aspen woods.
POPULUS TREMULOIDES +++ 1-5
BETULA PAPYRIFERA + 2-3
PINUS BANKSIANA + 3-4, a few to 1
Calamagrostis canadensis ++ to +++
Spiraea alba +
Spiraea tomentosa +
Rosa sp. +
Glyceria canadensis +
Galeopsis tetrahit +
Lycopus virginicus +
Rubus hispidus ++
Solidago canadensis +

b31. Willow thickets.
Salix sp. +++
Salix amygdaloides ++ to +++
Spiraea alba ++
Calamagrostis canadensis ++

Solidago gigantea +
Scirpus cyperinus +

b32. Wet aspen woods. Species composition similar to b30.

b33. Bluejoint marsh.
Calamagrostis canadensis +++
POPULUS TREMULOIDES + 2-4
Iris versicolor +++
Salix amygdaloides +
Solidago gigantea ++
Spiraea tomentosa +
Rubus sp. +
Rubus hispidus +

c1. b34. Mixed woods.
POPULUS TREMULOIDES ++ 1-4
BETULA PAPYRIFERA ++ 3-5
PINUS BANKSIANA + 2-7
Rubus sp. +
Vaccinium angustifolium ++
Spiraea alba ++
Spiraea tomentosa ++
Aster tradescanti +
Solidago canadensis +
Carex sp. ++
Rubus hispidus ++
Calamagrostis canadensis +
unknown grass +
Fragaria vesca ++

c2. b35. Jack pine woods.
PINUS BANKSIANA +++ 1-10
BETULA PAPYRIFERA + 1-4
POPULUS TREMULOIDES + ½-1½
Vaccinium angustifolium +
Spiraea tomentosa +
Rubus hispidus +++
Fragaria vesca +
Potentilla simplex +
Pyrola rotundifolia +
Achillea millefolium +
Carex sp. +
Polytrichum sp. +

c3. Open mixed woods.
POPULUS TREMULOIDES ++ 1-4
BETULA PAPYRIFERA ++ 1-5
PINUS BANKSIANA + 1-4
Pinus strobus seedlings +
Rubus sp. ++
Spiraea alba ++
Spiraea tomentosa ++
Vaccinium angustifolium +
Rubus hispidus +++
Carex sp. +
Achillea millefolium +
Polytrichum sp. ++

c4. Opening.
Spiraea tomentosa +++
Spiraea alba ++
Solidago canadensis ++
Rubus hispidus +++
Potentilla simplex ++
Fragaria vesca ++
Hieracium aurantiacum ++
Achillea millefolium ++
Pinus strobus seedlings +
Polytrichum sp. +++

c5. Understory variation of c3.
Tree species similar.
Spiraea alba +++
Spiraea tomentosa +++
Rubus sp. +
Rosa sp. +
Pinus strobus seedlings ++
unknown grass ++
Rubus hispidus ++
Carex sp. +
Fragaria vesca +

c6. Willow-bluejoint marsh. Species composition similar to c11.

c7. Open mixed woods.
POPULUS TREMULOIDES + ½-2
BETULA PAPYRIFERA + ½-2
PINUS BANKSIANA + 1-3
PINUS STROBUS +, locally ++ ½-2
Spiraea alba +++
Spiraea tomentosa ++
Comptonia peregrina ++, locally +++
Salix amygdaloides ++, locally +++
Rubus sp. ++
Alnus rugosa +
Solidago canadensis ++
Solidago gigantea +
Calamagrostis canadensis ++
Carex sp. ++
Aster tradescanti +
Rubus hispidus +
Fragaria vesca +
Polytrichum sp. ++

c8. Localized aspen grove.

c9. Localized jack pines.

c10. Alder thicket.
Alnus rugosa +++ ½-2
Salix amygdaloides +, locally ++
Aronia melanocarpa + (on ecotone with c11)
Fragaria vesca +
Carex sp. +
Polytrichum sp. +
Sphagnum sp. ++
Brachythecium sp. +

c11. Willow-bluejoint marsh.
Calamagrostis canadensis +++
Salix amygdaloides + to +++
Aronia melanocarpa +, ++ on ecotone with c10)
Ilex verticellata +
Spiraea tomentosa ++
Spiraea alba ++
Rubus sp. + to ++

c11, continued.
Solidago gigantea +, locally ++
Poa palustris + to ++
Aster tradescanti +
Carex sp. +
Dryopteris cristata +
Polytrichum sp. +

c12. Localized aspens.

c13. Jack pine woods. Species composition similar to c2.

c14. Localized aspens.

c15. Mixed hardwoods.
ACER RUBRUM +++ 1-3, occasionally 4
BETULA PAPYRIFERA ++ 1-4
PINUS BANKSIANA + 6-8 (one 11)
Osmunda cinnamomea +
Carex sp. +
Rubus hispidus + (occurs only under jack pines)

c16. Willow-bluejoint thicket-marsh.
Salix amygdaloides +++
Calamagrostis canadensis ++ to +++
POPULUS TREMULOIDES + 2-3
Ilex verticillata +
Spirea alba ++
Spirea tomentosa ++
Rosa sp. + to ++
Solidago gigantea ++
Solidago canadensis ++
Iris versicolor +
Onoclea sensibilis ++
Dryopteris cristata +

c17. Alder flowage.
Alnus rugosa ++ ½-3
Scirpus cyperinus (?) +++
Spiraea tomentosa +
Rosa sp. +
Rubus pubescens +
Sphagnum sp. +

c18. Alder-mixed hardwoods.
Alnus rugosa ++ ½-2
BETULA PAPYRIFERA ++ 1-4
POPULUS TREMULOIDES ++ 1-4
ACER RUBRUM + 1-3
Pinus strobus seedlings +
Vaccinium angustifolium +
Rubus hispidus +++
Rubus pubescens +
Carex sp. ++
unknown grass ++
Osmunda claytoniana +
Botrichium sp. +
Sphagnum sp. ++ to +++

c19. Mixed hardwoods. Ecotone with c18 is very broad. Boundary shown coincides with southern limit of abundant fern understory.

ACER RUBRUM +++ 1-3
POPULUS TREMULOIDES +++ 1-5
BETULA PAPYRIFERA ++ 1-4, one 11
PINUS STROBUS + 6-18
PRUNUS SEROTINA +2
Ilex verticellata ++
Rosa sp. +
Vaccinium angustifolium +
Quercus alba seedlings +
Pinus strobus seedlings +
Oryzopsis asperifolia ++
Lycopus uniflora +
Aster lateriflorus +
Coptis groenlandica ++
Rubus hispidus ++
Gaultheria procumbens +
Cornus canadensis ++
Viola sp. +
unknown grass +
unknown grass #2 +
unknown monocotyledon +
Carex sp. +
Osmunda cinnamomea ++
Osmunda claytoniana ++
Dryopteris spinulosa +
Pteridium aquilinum +
Athyrium sp. +
Maianthemum canadense +, locally ++
Aster sagittifolius +
Sphagnum sp. +

c20. White pine woods. Ecotone with c19 is broad.

PINUS STROBUS +++ 5-22
ACER RUBRUM +++ 1-4
BETULA PAPYRIFERA ++ 2-4, one 8
PRUNUS SEROTINA + 2
QUERCUS RUBRA + 2-3
POPULUS TREMULOIDES + 1-2
CARPINUS CAROLINIANA + 1
Ilex verticellata +
Corylus americana +
Vaccinium angustifolium +
Smilax hispida +
Rubus pubescens +
Rubus hispidus +, locally ++
Aster sagittifolius +
Oryzopsis asperifolia +, locally ++
Cornus canadensis +
Gaultheria procumbens +
Rhamnus frangula (?) +
Viola sp. +
Coptis groenlandica +

c20, continued.
Mitchella repens +, locally ++
Trientalis borealis ++
Equisetum arvense +, locally ++
Lactuca sp. +
Aster lateriflorus +
Bracheoletrum erectum +
Carex sp.
Osmunda claytoniana +
Osmunda cinnemomea +
Athyrium angustatum +
Onoclea sensibilis +
Dryopteris spinulosa +
Ulmus americana seedlings +
Quercus alba seedlings +

c21. Mixed hardwood ecotone.
BETULA PAPYRIFERA ++ 2-4
QUERCUS RUBRA ++ 5
QUERCUS ELLIPSOIDALIS ++ 3-4
QUERCUS ALBA + 2
POPULUS TREMULOIDES ++ 4
POPULUS GRANDIDENTATA + 4
PINUS BANKSIANA + 6
Pinus strobus seedlings +
Oryzopsis asperifolia ++
Corylus americana +
Crataegus sp. +
Carex sp. +
Pteridium aquilinum +

c22. Rubus-sweet fern meadow.
Rubus sp. +++
Comptonia peregrina +++
Rosa sp. +
Salix discolor +
Poa pratensis ++
Danthonia spicata ++
Phleum pratense ++
Agropyron repens ++
Quercus rubra seedlings +
Pinus strobus seedlings +
Lonicera tatarica +
Monarda fistulosa ++, south edge particularly
Solidago canadensis ++, south edge particularly
Lysimachia quadrifolia +
Aster ciliolatus +
Chrysanthemum leucanthemum +
Fragaria vesca +
Polytrichum sp. + on south edge
Hieracium aurantiacum +

D1. Alder-mixed hardwoods (similar to c18).
Alnus rugosa ++ NJ to +++ SE
BETULA PAPYRIFERA +++ 1-4
POPULUS TREMULOIDES ++ 1-3
ACER RUBRUM ++ 1-3
Rosa sp. ++
Spiraea alba +
Spiraea tomentosa ++
Salix amygdaloides +
Scirpus cyperinus ++
Calamagrostis canadensis ++
Aster lateriflorus +
Rubus hispidus ++
Pinus strobus seedlings +
Onoclea sensibilis ++
Sphagnum sp. ++

D2. Mixed hardwoods (similar to c19).
BETULA PAPYRIFERA ++ to +++ 1-4
ACER RUBRUM ++ to +++ 1-5
POPULUS TREMULOIDES ++ to +++ 1-5
PINUS STROBUS + 5-20
PINUS STROBUS SAPLINGS + to ++ 1-3
Ilex verticellata ++
Prunus serotina +
Vaccinium angustifolium +
Quercus rubra seedlings +
Rubus hispidus + to ++
Cornus canadensis ++
Coptis groenlandica +
Gaultheria procumbans +
Carex sp. +
Potentilla simplex +
Osmunda cinnamomea ++ to +++
Osmunda claytoniana +
Dryopteris cristata +
Dryopteris spinulosa +
Gymnocarpium dryopteris +
Sphagnum sp. +
Polytrichum sp. +
Alnus rugosa +

D3. Bluejoint-willow marsh.
Calamagrostis canadensis +++
Salix amygdaloides ++
Scirpus cyperinus ++
Aster umbellatus +
Spiraea alba ++
Spiraea tomentosa ++
Rubus hispidus +
Onoclea sensibilis +, locally +++
POPULUS TREMULOIDES + 1-2

Appendix 4B. Vascular plant species--U. W. - Stevens Point north campus generally; proposed Michigan Avenue extension specifically.

Abundance classes--refer to right of way only:

5 = abundant
4 = common
3 = fairly common
2 = scattered or locally abundant
1 = rare
+ = presence likely, but not verified

Species with no abundance designation occur on the north campus lands, but do not seem likely to occur along the proposed right of way.

Habitat tendencies--refer only to observations from this study:

B = white pine woods, mature second growth
C = mixed hardwoods, mostly wet sites
E = aspen woods
F = aspen openings
G = aspen-willow shrub savannah
J = open mixed woods
L = jack pine woods
M = openings, jack pine habitat
O = Danthonia meadow
P = Rubus-sweet fern opening
Q = willow thicket
R = bluejoint marsh
S = alder thicket
T = alder-mixed hardwoods

*Voucher collections are on file at the herbarium of the University of Wisconsin at Stevens Point for species marked with an asterisk.

| SPECIES | COMMON NAME | ABUNDANCE | HABITATS |
|---|---|---|---|
| Lycopodiaceae | Club Moss Family | | |
| Lycopodium annotinum | bristly club moss | | |
| Lycopodium obscurum | ground pine | | |
| Lycopodium inundatum | club moss | | |
| Equisetaceae | Horsetail Family | | |
| Equisetum sylvaticum | woodland horsetail | | |
| *Equisetum arvense | field horsetail | 3 | B |
| Ophioglossaceae | Adder's-Tongue Family | | |
| Botrichium sp. | grape fern | 1 | |
| Osmundaceae | Royal Fern Family | | |
| Osmunda regalis | royal fern | | |
| *Osmunda cinnamomea | cinnamon fern | 3 | BC |
| *Osmunda claytoniana | interrupted fern | 2 | BCT |

| | | | |
|---|---|---|---|
| Polypodiaceae | Polypody Family | | |
| *Pteridium aquilinum | bracken fern | 2 | C |
| Adiantum pedatum | maidenhair fern | | |
| *Onoclea sensibilis | sensitive fern | 4-5 | BFGQRT |
| *Athyrium filix-femina | lady fern | 2 | C |
| *Athyrium angustatum | slender lady fern | 3 | B |
| Cystopteris bulbifera | bulblet fern | | |
| Thelypteris palustris | marsh fern | | |
| *Gymnocarpium dryopteris | oak fern | 1 | C |
| *Dryopteris spinulosa | spinulose wood fern | 2 | BCG |
| *Dryopteris cristata | crested shield fern | 2 | CGR |
| Pinaceae | Pine Family | | |
| Pinus banksiana | jack pine | 5 | CEFJL |
| Pinus strobus | white pine | 4 | BCFJ |
| Pinus resinosa | red pine | | |
| Typhaceae | Cattail Family | | |
| Typha latifolia | broadleaf cattail | | |
| Alismaceae | Arrowhead Family | | |
| *Alisma plantago-aquatica | water plantain | | |
| Sagittaria latifolia | broadleaf arrowhead | | |
| Hydrocharitaceae | Frog's-bit Family | | |
| *Elodea canadensis | elodea | | |
| Gramineae | Grass Family | | |
| Bromus inermis | smooth brome | | |
| Bromus canadensis | fringed brome | | |
| *Glyceria canadensis | rattlesnake manna | 5 | EFJQR |
| Glyceria grandis | tall manna | + | |
| Glyceria striata | manna grass | + | |
| *Poa pratensis | Kentucky bluegrass | 2 | OP |
| Poa compressa | Canada bluegrass | | |
| *Poa palustris | meadow bluegrass | 4 | QR |
| Eragrostis spectabilis | purple lovegrass | | |
| Eragrostis pectinacea | lovegrass | | |
| Eragrostis cilianensis | stinkgrass | | |
| Schizachne purpurascens | | | |
| Agropyron repens | quack grass | 2 | P |
| Elymus canadensis | Canada wild rye | | |
| Elymus virginicus | Virginia wild rye | | |
| Hordeum jubatum | squirrel-tail barley | | |
| *Koeleria cristata | June grass | + | |
| *Danthonia spicata | poverty oats | 4 | OP |
| *Calamagrostis canadensis | bluejoint | 5 | EFJQRT |
| *Agrostis gigantea | redtop | + | |
| Agrostis hyemalis | ticklegrass | + | |
| *Agrostis perennans | | | |
| Cinna arundinacea | wood reed | | |
| Phleum pratense | timothy | 2 | P |
| *Muhlenbergia mexicana | muhly | + | |
| Muhlenbergia racemosa | muhly | | |
| Sporobolus cryptandrus | dropseed | | |
| Sporobolus vaginiflorus | dropseed | | |

| | | | |
|---|---|---|---|
| *Brachyelytrum erectum | | 2 | B |
| Oryzopsis asperifolia | rice grass | 4 | BC |
| Aristida basiramea | triple-awn grass | + | |
| Beckmannia syzigachne | slough grass | | |
| *Spartina pectinata | cord grass | + | |
| Phalaris arundinacea | reed canary grass | + | |
| Leersia oryzoides | rice cut-grass | + | |
| Digitaria sanguinalis | hairy crab grass | | |
| Digitaria ischaemum | smooth crab grass | | |
| Leptoloma cognatum | fall witch grass | + | |
| *Panicum capillare | witch grass | | |
| *Panicum lanuginosum | hairy panic grass | 1 | Q |
| Panicum oligosanthes | panic grass | | |
| Panicum xanthophysum | panic grass | | |
| Panicum latifolium | broadleaf panic grass | | |
| Panicum boreale | northern panic grass | | |
| *Echinochloa muricata | barnyard grass | | |
| Echinochloa crusgalli | barnyard grass | | |
| Setaria viridis | green foxtail | | |
| Setaria lutescens | yellow foxtail | | |
| Cenchrus longispinus | sandbur | | |
| Andropogon gerardi | big bluestem | | |
| Schizachyrium scoparium | little bluestem | | |
| | | | |
| Cyperaceae | Sedge Family | | |
| *Cyperus (5-6 species) | galingale, nutgrass | + | |
| Dulichium arundinaceum | three-way sedge | | |
| *Carex (ca. 20 species) | sedge | 5 | most |
| *Scirpus cyperinus | woolgrass | 5 | FJQRST |
| Scirpus atrovirens | | * | |
| Scirpus acutus | bulrush | | |
| Scirpus (3-4 species) | | | |
| *Eleocharis acicularis | spike rush | 2 | Q |
| *Eleocharis obtusa | spike rush | | |
| Eleocharis sp. | spike rush | + | |
| Eriophorum sp. | cottongrass | + | |
| | | | |
| Araceae | Jack-in-the-pulpit Family | | |
| Symplocarpus foetidus | skunk cabbage | | |
| Acorus americanus | sweet flag | | |
| | | | |
| Lemnaceae | Duckweed Family | | |
| Lemna minor | common duckweed | | |
| | | | |
| Juncaceae | | | |
| *Juncus effusus | rush | + | |
| Juncus bufonius | toad rush | | |
| Juncus tenuis | rush | | |
| Juncus canadensis | rush | | |
| Juncus acuminatus | rush | | |
| Juncus sp. | rushes | | |
| Luzula acuminata | wood rush | | |

| | | | |
|---|---|---|---|
| Liliaceae | Lily Family | | |
| Clintonia borealis | blue bead lily | + | |
| *Maianthemum canadense | Canada mayflower | 2 | C |
| Polygonatum pubescens | Solomon's seal | | |
| *Smilax hispida | greenbrier | 1 | B |
| *Uvularia sessilifolia | small-flowered bellwort | 2 | C |
| Amaryllidaceae | Amaryllis Family | | |
| Hypoxis hirsuta | stargrass | | |
| Iridaceae | Iris Family | | |
| *Iris versicolor | blue flag | 2 | R |
| Iris virginica | blue flag | | |
| Sisyrinchium campestre | blue-eyed grass | | |
| Salicaceae | Willow Family | | |
| Salix lucida | shining willow | + | |
| *Salix amygdaloides | peach-leaf willow | 5 | FGJQRST |
| Salix petiolaris | willow | | |
| *Salix discolor | pussy willow | 3 | FGJPQR |
| *Salix bebbiana | beaked willow | + | |
| Salix humilis | upland willow | | |
| Salix interior | sandbar willow | | |
| Salix rigida | willow | | |
| *Populus tremuloides | quaking aspen, popple | 5 | BCEFGJLQRT |
| Populus grandidentata | largetooth aspen | 2 | CE |
| Myricaceae | Bayberry Family | | |
| *Comptonia peregrina | sweet fern | 4 | JLMP |
| Betulaceae | Birch Family | | |
| *Corylus americana | hazelnut | 2 | BC |
| Ostrya virginiana | ironwood, hop-hornbeam | | |
| Carpinus caroliniana | ironwood, musclewood | 1 | B |
| Betula papyrifera | paper birch | 4 | BCEFJLT |
| Betula pumila | swamp-birch | | |
| *Alnus rugosa | speckled alder, tag alder | 5 | CJST |
| Fagaceae | Beech Family | | |
| *Quercus alba | white oak | 2 | C |
| *Quercus rubra | red oak | 2 | BC |
| Quercus velutina | black oak | | |
| *Quercus ellipsoidalis | Hill's oak, northern pin oak | 2 | P |
| Ulmaceae | Elm Family | | |
| Ulmus americana | American elm | | |
| Ulmus rubra | slippery elm | | |
| Urticaceae | Nettle Family | | |
| Urtica dioica | stinging nettle | | |
| Laportea canadensis | wood nettle | | |
| Boehmeria cylindrica | false nettle | | |

| | | | |
|---|---|---|---|
| Aizoaceae | Carpet Weed Family | | |
| Mullugo verticillata | carpet weed | | |
| Portulacaceae | Purslane Family | | |
| Portulaca oleracea | purslane | | |
| Claytonia virginica | spring beauty | | |
| Caryophyllaceae | Pink Family | | |
| Stellaria media | chickweed | | |
| Cerastium vulgatum | mouse-ear chickweed | | |
| Lychnis alba | corn cockle | | |
| Silene cucubalus | bladder campion | | |
| Dianthus deltoides | pink | | |
| Polygonaceae | Smartweed Family | | |
| Rumex acetosella | sheep sorrel | + | |
| Rumex crispus | dock | | |
| Rumex orbiculatus | water dock | | |
| Polygonum cuspidatum | tall knotweed | | |
| Polygonum aviculare | knotweed | | |
| Polygonum hydropiperoides | aquatic smartweed | | |
| *Polygonum lapathifolium | nodding smartweed | | |
| *Polygonum pensylvanicum | Pennsylvania smartweed | | |
| Polygonum hydropiperoides | water smartweed | | |
| *Polygonum punctatum | | | |
| *Polygonum sagittatum | tearthumb smartweed | 2 | R |
| *Polygonum cilinode | false buckwheat | | |
| *Polygonum scandens | false buckwheat | 1 | J |
| Chenopodiaceae | Goosefoot Family | | |
| Cycloloma atriplicifolium | winged pigweed | | |
| Chenopodium album | lambsquarters | | |
| Amaranthaceae | Amaranth Family | | |
| Amaranthus graecizans | prostrate pigweed | | |
| Amaranthus retroflexus | redroot pigweed | | |
| Ranunculaceae | Crowfoot Family | | |
| Actaea pachypoda | baneberry | | |
| Thalictrum dasycarpum | meadow rue | | |
| Aquilegia canadensis | columbine | | |
| Caltha palustris | marsh marigold | | |
| Ranunculus fascicularis | early buttercup | | |
| Ranunculus acris | tall buttercup | | |
| Ranunculus pensylvanicus | buttercup | | |
| *Ranunculus sceleratus | swamp buttercup | + | |
| Anemone canadensis | anemone | | |
| Hepatica americana | hepatica | | |
| *Coptis groenlandica | goldthread | 2 | BC |
| Papaveraceae | Poppy Family | | |
| Sanguinaria canadensis | bloodroot | | |
| Dicentra cucullaria | Dutchman's breeches | | |

| | | | |
|---|---|---|---|
| Cruciferae | Mustard Family | | |
| Lepidium campestre | pepper grass | | |
| Lepidium virginicum | pepper grass | | |
| Thlaspi arvense | penny cress | | |
| Capsella bursa-pastoris | shepherd's purse | | |
| Berteroa incana | hoary alyssum | | |
| Arabis lyrata | rock cress | | |
| *Cardamine sp. | bitter cress | | |
| *Rorippa islandica | marsh cress | 2 | Q |
| Barbarea vulgaris | yellow rocket | | |
| Crassulaceae | Orpine Family | | |
| Penthorum sedoides | ditch stonecrop | | |
| Saxifragaceae | Saxifrage Family | | |
| Mitella diphylla | bishop's cap | | |
| Ribes (2-3 species?) | currants, gooseberries | | |
| Rosaceae | Rose Family | | |
| Physocarpus opulifolius | ninebark | | |
| *Spiraea alba | meadowsweet | 5 | EFGJQRT |
| *Spiraea tomentosa | hardhack | 5 | EFGJLMOQRST |
| *Fragaria vesca | strawberry | 3-4 | FJLOMPS |
| Fragaria virginiana | strawberry | + | |
| *Potentilla simplex | cinquefoil | 5 | FJLMOQ |
| *Potentilla norvegica | rough cinquefoil | + | |
| Potentilla recta | pale cinquefoil | | |
| Potentilla arguta | silvery cinquefoil | | |
| *Potentilla tridentata | northern cinquefoil | 2 | M |
| Geum canadense | avens | | |
| Geum aleppicum | avens | | |
| *Rubus hispidus | dewberry | 5 | BCEFGJLMOPQRT |
| Rubus flagellaris | northern dewberry | + | |
| Rubus allegheniensis | blackberry | + | |
| *Rubus pubescens | dwarf blackberry | 2 | BST |
| *Rubus sp. | blackberries, brambles | 5 | EFJLMOPQR |
| Agrimonia gryposepala | agrimony | | |
| *Rosa sp. | wild rose | 2 | CEPRST |
| *Prunus serotina | black cherry | 2 | BC |
| Prunus virginiana | choke cherry | + | |
| Prunus pensylvanica | pin cherry | | |
| *Aronia melanocarpa | chokeberry | 3 | RS |
| *Crataegus sp. | hawthorn | 1 | C |
| Amelanchier sp. | serviceberry | | |
| *Sorbus sp. | mountain-ash | 1 | |
| Leguminosae | Bean Family | | |
| Trifolium pratense | red clover | | |
| Trifolium arvense | rabbit's foot clover | | |
| Trifolium repens | white clover | | |
| Trifolium hybridum | alsike clover | | |
| Trifolium agrarium | hop clover | | |
| Melilotus alba | white sweet clover | | |
| Melilotus officinalis | yellow sweet clover | | |
| Medicago lupulina | black medick | | |
| Vicia villosa | vetch | | |

| | | | |
|---|---|---|---|
| Oxalidaceae | Wood-sorrel Family | | |
| Oxalis stricta | yellow sorrel | + | |
| Oxalis europaea | yellow sorrel | | |
| Polygalaceae | Milkwort Family | | |
| Polygala polygama | milkwort | | |
| Euphorbiaceae | Spurge Family | | |
| Acalypha rhomboidea | copperleaf | | |
| Euphorbia maculata | prostrate spurge | | |
| Euphorbia corollata | flowering spurge | | |
| Callitrichaceae | Water Starwort Family | | |
| *Callitriche sp. | water starwort | + | |
| Anacardiaceae | Cashew Family | | |
| Toxicodendron radicans | poison ivy | | |
| Aquifoliaceae | Holly Family | | |
| *Ilex verticillata | winterberry | 3 | BCR |
| Nemopanthus mucronatus | bog holly | + | |
| Aceraceae | Maple Family | | |
| *Acer rubrum | red maple | 3-4 | BCT |
| Acer saccharinum | silver maple | | |
| Acer negundo | box elder | | |
| Balsaminaceae | Touch-me-not Family | | |
| Impatiens capensis | jewelweed, touch-me-not | + | |
| Rhamnaceae | Buckthorn Family | | |
| *Rhamnus frangula | buckthorn | 1 | B |
| Vitaceae | Grape Family | | |
| Vitis sp. | wild grape | | |
| Parthenocissus quinquefolia | Virginia creeper | | |
| Tiliaceae | Linden Family | | |
| Tilia americana | basswood | | |
| Hypericaceae | St. John's-wort Family | | |
| Hypericum perforatum | St. John's wort | | |
| Hypericum boreale | St. John's wort | | |
| Hypericum canadense | St. John's wort | | |
| Cistaceae | Rockrose Family | | |
| Helianthemum canadense | frostweed | | |
| Violaceae | Violet Family | | |
| Viola pedata | birdfoot violet | | |
| Viola papilionacea | stemless blue violet | + | |
| Viola conspersa | American dog violet | + | |
| Viola sagittata | arrowhead violet | | |
| Viola pubescens | downy yellow violet | | |
| Viola sp. | other violets | + | |

| | | | |
|---|---|---|---|
| Onagraceae | Evening-primrose Family | | |
| *Ludwigia alternifolia | seedbox | 1 | Q |
| *Ludwigia palustris | marsh purslane | 1 | Q |
| Epilobium angustifolium | fireweed | | |
| *Epilobium leptocaulon | herb willow | + | |
| Oenothera biennis | evening primrose | | |
| Oenothera perennis | sundrops | | |
| Circaea quadrisculata | enchanter's nightshade | + | |
| Araliaceae | Ginseng Family | | |
| Aralia nudicaulis | wild sarsaparilla | | |
| Parsley [illegible] | [illegible] | | |
| Umbelliferae | Parsley Family | | |
| Sanicula marilandica | black snakeroot | | |
| Osmorhiza longistylis | sweet cicely | | |
| Carum carvi | wild caroway | | |
| Sium suave | water parsnip | | |
| *Cicuta maculata | water hemlock | | |
| *Cicuta bulbifera | bulblet water hemlock | | |
| Cornaceae | Dogwood Family | | |
| *Cornus canadensis | bunchberry | 4 | BC |
| Cornus alternifolia | alternate leaf dogwood | | |
| Cornus stolonifera | red ossier dogwood | + | |
| Ericaceae | Heath Family | | |
| *Monotropa uniflora | Indian pipe | 1 | C |
| *Pyrola rotundifolia | shinleaf | 2 | L |
| *Gaultheria procumbens | wintergreen | 2 | BC |
| *Vaccinium angustifolium | blueberry | 2 | BCJLT |
| Vaccinium myrtilloides | blueberry | | |
| Primulaceae | Primrose Family | | |
| *Lysimachia terrestris | loosestrife | | |
| *Lysimachia quadrifolia | yellow loosestrife | 2 | P |
| *Trientalis borealis | starflower | 3 | B |
| Oleaceae | Olive Family | | |
| Fraxinus pennsylvanica | green ash | | |
| Asclepiadaceae | Milkweed Family | | |
| Asclepias syriaca | common milkweed | | |
| *Asclepias incarnata | swamp milkweed | 2 | P |
| [illegible] | [illegible] | | |
| Convolvulaceae | Morning-glory Family | | |
| Convolvulus spithamaeus | low bindweed | | |
| Boraginaceae | Borage Family | | |
| Lithospermum canescens | hoary puccoon | | |
| Verbenaceae | Vervain Family | | |
| Verbena stricta | vervain | | |
| *Verbena hastata | vervain | + | |
| Verbena bracteata | creeping vervain | | |

| | | | |
|---|---|---|---|
| Labiatae | Mint Family | | |
| *Scutellaria lateriflora | mad-dog skullcap | | |
| Scutellaria [illegible] | skullcap | | |
| Prunella [illegible] | self-heal | | |
| Stachys palustris | hedge nettle | | |
| *Stachys hispida | hedge nettle | 2 | |
| *Monarda fistulosa | bergamot | 2 | P |
| *Lycopus [illegible] | water horehound | 2 | C |
| *Lycopus virginicus | water horehound | 3 | EQ |
| *Galeopsis tetrahit | hemp-nettle | 2 | ER |
| Solanaceae | Nightshade Family | | |
| Solanum dulcamara | bittersweet nightshade | | |
| Scrophulaceae | Figwort Family | | |
| Gratiola neglecta | hedge hyssop | | |
| *Verbascum thapsus | mullein | | |
| *Chelone glabra | turtlehead | | |
| Linaria vulgaris | butter-and-eggs | | |
| Veronica serpyllifolia | speedwell | | |
| Veronica [illegible] | speedwell | | |
| *Veronica arvensis | speedwell | 1 | Q |
| *Veronica sp. | speedwell | 1 | Q |
| Plantaginaceae | Plantain Family | | |
| Plantago major | plantain | | |
| Plantago rugelii | plantain | | |
| Rubiaceae | Madder Family | | |
| *Galium trifidum | bedstraw | 2 | |
| *Galium (ca. 5 others) | bedstraws | 3 | LMQ |
| *Mitchella repens | partridge-berry | 2 | B |
| Caprifoliaceae | Honeysuckle Family | | |
| Diervilla lonicera | bush honeysuckle | | |
| *Lonicera tatarica | Tartarian honeysuckle | 2 | P |
| *Sambucus sp. | elder | 1 | |
| Cucurbitaceae | Gourd Family | | |
| Echinocystis lobata | wild cucumber | | |
| Campanulaceae | Harebell Family | | |
| Lobelia siphilitica | lobelia | | |
| *Lobelia inflata | Indian tobacco | | |
| Compositae | Composite Family | | |
| Helianthus divaricatus | sunflower | | |
| Helianthus occidentalis | western sunflower | | |
| *Bidens [illegible] | beggar-tick | | |
| *Bidens frondosa | beggar-tick | | |
| *Ambrosia artemisiifolia | ragweed | | |
| Helenium autumnale | sneezeweed | | |

| | | | | |
|---|---|---|---|---|
| Achillea millefolium | yarrow | 2 | | JLOP |
| Chrysanthemum leucanthemum | ox-eye daisy | 2 | | P |
| Matricaria matricarioides | pineapple weed | | | |
| Artemisia gnaphalodes | wormwood | | | |
| Solidago hispida | slender bog goldenrod | | | |
| *Solidago uliginosa | slender bog goldenrod | 2 | | |
| Solidago flexicaulis | twisted-stalk goldenrod | | | |
| *Solidago nemoralis | gray goldenrod | | | |
| Solidago juncea | early goldenrod | | | |
| *Solidago glaberrima | tall smooth goldenrod | 5 | | FGJQR |
| *Solidago canadensis | tall goldenrod | 5 | | EFGJLOPQ |
| *Solidago graminifolia | grass-leaf goldenrod | 4 | | LQ |
| Aster macrophyllus | large-leaf aster | + | | |
| Aster cordifolius | northern arrowhead aster | | | |
| *Aster sagittifolius | arrowhead aster | 2 | | BC |
| Aster puniceus | purple-stem aster | | | |
| Aster praealtoides | purple-stem aster | | | |
| *Aster umbellatus | flat-topped aster | 3 | | FQR |
| *Aster lateriflorus | narrow-leaf woodland aster | 3 | | BCFJLMRT |
| *Aster simplex | narrow-leaf marsh aster | 3 | | FR |
| *Aster lanceolatus | narrow-leaf marsh aster | 3 | | JLMQR |
| Erigeron annuus | fleabane daisy | | | |
| *Conyza canadensis | horseweed | | | |
| Antennaria sp. | pussy-toes | | | |
| *Gnaphalium obtusifolium | sweet everlasting | | | |
| *Gnaphalium uliginosum | small everlasting | + | | |
| Eupatorium purpureum | purple Joe-Pye weed | | | |
| *Eupatorium perfoliatum | boneset | | | |
| Eupatorium rugosum | white snakeroot | | | |
| Liatris aspera | blazing star | | | |
| Cirsium arvense | Canada thistle | | | |
| Cirsium vulgare | bull thistle | | | |
| Prenanthes alba | white wild lettuce | | | |
| *Hieracium aurantiacum | orange hawkweed | 2 | | P |
| Hieracium pratense | king devil | | | |
| Hieracium canadense | Canadian hawkweed | | | |
| Taraxacum officinale | dandelion | | | |
| *Lactuca canadensis | wild lettuce | 2 | | B |

Appendix 4C Bryophytes (all mosses, no liverworts or hornworts) collected on continuous tract of land east of Reserve Street between Maria Drive and North Point Drive, fall 1974.

*Collections from proposed Michigan Avenue extension right of way indicated with an asterisk.

Sphagnaceae
*Sphagnum 2-3 species
Tetraphidaceae
*Tetraphis pellucida
Polytrichaceae
*Polytrichum commune
*Polytrichum onicensis
Dicranaceae
Dicranum fuscescens
Dicranella heteromalla
Grimmiaceae
Hedwigia ciliata
Aulacomniaceae
*Aulacomnium palustre
Mniaceae
*Mnium cuspidatum
*Mnium lycopodioides
Bryaceae
*Pohlia nutans
Hypnaceae
*Brachythecium oxycladon
Brachythecium plumosum
*Brachythecium rutabulum
*Brachythecium salebrosum
Calliergon cordifolium
Campylium stellatum
Campylium sp.
Climacium dendroides

Hypnum curvifolium
*Hypnum pallescens
Hypnum imponens
Hypnum pratense
Leptodictyum trichopodium
*Ptilium crista-castrensis
*Rhynchostegium serrulatum
Sematophyllaceae
*Heterophyllium haldanianum
Leskeaceae
*Helodium blandowii

Appendix 5A. Mammals observed or trapped on or within 100 yards of the proposed Michigan Avenue extension, fall 1974.

| | |
|---|---|
| Odocoileus virginianus | white-tailed deer |
| Sciurus carolinensis | gray squirrel |
| Tamiasciurus hudsonicus | red squirrel |
| Sylvilagus floridanus | cottontail rabbit |
| Tamias striatus | eastern chipmunk |
| Peromyscus leucopus | white-footed mouse |
| Zapus hudsonius | meadow jumping mouse |
| Microtus pennsylvanicus | meadow vole |
| Condylura cristata | starnose mole |
| Blarina brevicauda | shorttail shrew |
| Sorex cinereus | masked shrew |
| Sorex arcticus | arctic shrew |

The following were not observed in this survey, but were reported as being present on the north-campus area within the past two years.

| | |
|---|---|
| Mustela erminea | shorttail weasel |
| Rattus norvegicus | Norway rat |
| Glaucomys sp. | flying squirrel |
| Citellus tridecemlineatus | thirteen-lined ground squirrel |
| Ondatra zibethica | muskrat |

Appendix 5B. Reptiles known to reside in the area of the proposed Michigan Avenue extension.

| | |
|---|---|
| Chelydra serpentina | snapping turtle |
| Clemmys insculpta | wood turtle |
| Chrysemys picta marginata | painted turtle |
| Eumeces fasciatus | five-lined skink |
| Storeria occipitomaculata | red-bellied snake |
| Storeria dekayi wrightorum | northern brown snake |
| Thamnophis sirtalis sirtalis | Eastern garter snake |
| Diadophis punctatus edwardsi | northern ringneck snake |
| Opheodrys vernalis | smooth green snake |
| Elaphe vulpina vulpina | fox snake |
| Heterodon platyrhinos | eastern hognose snake |

Appendix 5C. Amphibians known to reside in the area of the proposed Michigan Avenue extension.

| | |
|---|---|
| Ambystoma tigrinum tigrinum | eastern tiger salamander |
| Plethodon cinereus cinereus | red-backed salamander |
| Bufo americanus americanus | American toad |
| Hyla versicolor versicolor | gray treefrog |
| Hyla crucifer crucifer | spring peeper |
| Pseudacris triseriata triseriata | chorus frog |
| Rana clamitans melanota | green frog |
| Rana sylvatica sylvatica | wood frog |
| Rana pipiens pipiens | leopard frog |

Appendix 6. Birds observed on continuous tract of land east of Reserve Street between Maria Drive and North Point Drive, fall 1974. *Those based on a single sighting marked with an asterisk.

| | |
|---|---|
| Bonasa umbellus | ruffed grouse |
| Zenaidura macroura | mourning dove |
| *Colaptes auratus | yellow shafted flicker |
| Parus atricapillus | black-capped chickadee |
| Hylocichla mustelina | wood thrush |
| Hylocichla guttata | hermit thrush |
| Cyanocitta cristata | blue jay |
| Sturnus vulgaris | starling |
| Corvus brachyrhynchos | common crow |
| *Dendroica pennsylvanica | chestnut-sided warbler |
| Dendroica palmarum | palm warbler |
| Dendroica coronata | myrtle warbler |
| Turdus migratorius | robin |
| *Sitta carolinensis | white-breasted nuthatch |
| Passer domesticus | house sparrow |
| Agelaius phoeniceus | redwinged blackbird |
| Molothrus ater | brown-headed cowbird |
| Quiscalus quiscula | common grackle |
| *Pheucticus ludocicianus | rose-breasted grosbeak |
| Pooecetes gramineus | vesper sparrow |
| Spinus tristis | American goldfinch |
| Junco hyemalis | slate-colored junco |
| Zonotrichia albicollis | white-throated sparrow |
| Melospiza melodia | song sparrow |

App. 6

| | |
|---|---|
| *Telmatodytes palustris | long-billed marsh wren |
| Seiurus aurocapillus | ovenbird |
| Philohela minor | American woodcock |
| Toxostoma rufuns | brown thrasher |
| Carpodacus purpureus | purple finch |
| Sturnella magna | eastern meadowlark |
| *Circees cyaneus | marsh hawk |
| Strix varia | barred owl |
| *Bubo virginianus | great horned owl |
| Charadrius vociferus | killdeer |
| Mniotilta varia | black and white warbler |

APPENDIX 7

Student Chapter of The Wildlife Society
College of Natural Resources
University of Wisconsin
Stevens Point, Wisconsin 54481
23 October 1974

Dr. David Hillier
Coordinator Michigan Avenue Extension Biological Assessment
Department of Biology
University of Wisconsin
Stevens Point, Wisconsin 54481

Dr. Hillier:

We are writing in regard to the proposed Michigan-Avenue extension through property belonging to the University of Wisconsin-Stevens Point. The Student Chapter of The Wildlife Society at the University of Wisconsin-Stevens Point is opposed to the construction of the road for the following reasons. The planned route will destroy wildlife habitat and hinder the movement of those species which remain after the road is completed. Aesthetic and recreational appeal of the area will be greatly reduced and therefore utilization by UW-SP students and the community will be proportionately reduced. Present utility of the wooded area for outdoor educational studies in such fields as ecology, forestry, wildlife and biology can only be lessened by the proposed road. Many students who come to the wooded area for solitude will no longer have a feeling of wildness in the area due to the increased noise. There is no other such area available within walking distance of the campus. The road would therefore deprive students of the psychological benefits such an area has to offer.

The Society is also opposed to the construction of Dreyfus Lake, unless studies of bedrock characteristics, soil drainage, and geological and biological effects show that the lake would not significantly alter surrounding land communities.

The Society urges that alternative routes be carefully examined in an effort to restore the entire acreage bounded by Maria Drive, North Point Drive, Highway 51 and the proposed Michigan Avenue extension be left as a solid block of wild land.

The Student Chapter of The Wildlife Society feels its position on the proposed road is supported by stated objectives of The Wildlife Society such as: "(1) to develop and promote sound stewardship of wildlife resources and of the environments upon which wildlife and man depend, and (2) to undertake an active role in preventing man-induced environmental degradation."

When Aldo Leopold speaks of the importance of the development of a land ethic in the people he states that "a system of conservation based solely on economic self-interest is hopelessly lopsided. It tends to ignore, and thus eventually to eliminate, many elements in the land community that lack commercial value, but that are essential to its healthy functioning." We feel that the proposed road and lake represent a step backwards in the realization of a land ethic.

Although we oppose the road and lake, we realize that the road and lake proposal may be followed through. We have discussed this matter with the Environmental Council and we support the provisions they have stated, such as a naturally restored, minimum access lake designed to make it suitable for environmental studies. We hope that Reserve Street north of Maria Drive will be closed off and plowed up so that natural succession may follow sooner.

The Student Chapter of The Wildlife Society hopes that our position and the suggestions we have made on the proposed road extension and the lake will be kept in mind as further plans develop.

Respectfully,

Alice Wywialowski

Alice Wywialowski, President
Student Chapter of The Wildlife Society

Student Advisory Committee
College of Natural Resources
Univ. of Wis.-Stevens Point
October 17, 1974

Dear Sirs:

We, the members of the Student Advisory Committee for the College of Natural Resources, University of Wis., Stevens Point, would like to express our intense opposition to the proposed Michigan Ave. extension. We have ample reason to reject the proposed road, and student use of the area is one of them. This land, located north of the UW-SP campus, is used widely by the students for both academic and recreational functions. The noise and exhaust fumes would depreciate the value of this land to the student tremendously.

We, being students of the College of Natural Resources, are not merely concerned with our immediate needs, but also the needs of the wildlife in the area. We would like you to consider the increase in road kills and the obstruction of wildlife movement from one side of the road to the other. We suggest, that if the road is built, measures be taken to protect wildlife from these two infractions on their freedom by providing: (1) fences along the sides of the road and (2) passageways under the road so that movement would not be interfered with.

The forests are another one of our concerns. This particular area is one with a variety of habitats and hence, many types of species, both plant and animal. The road, as it is presently mapped, cuts directly through a white pine stand,

exact location is the W½ of NW¼ of Sec. 28, T.24N., R.8E. White pine, being a very vulnerable species, would not be able to tolerate the increased exhaust fumes. If the road were to run east of the stand, some trees could be saved from needless destruction. In combination with the above statement, we ask that the minimum 66' clearance be used, as to spare the maximum number of trees.

The road, as it is presently designed, cuts the land north of the campus in half, thus decreasing the mobility of wildlife, disturbing breeding grounds, devaluating the value of the land to the student through increased noise and exhaust, and needlessly wasting land and money to serve one company's needs. We, the students, ask that you consider the student's needs as well.

Students Working for Students,
Student Advisory Committee

THE ENVIRONMENTAL COUNCIL
U. W. Stevens Point
Stevens Point, Wis. 54481

October 31, 1974

Dr. David Hillier
Department of Biology
University of Wisconsin
Stevens Point, WI 54481

Dear Dr. Hillier,

This letter represents the opinion of the U.W.-S.P. Environmental Council concerning the proposed Michigan Ave. extention in Stevens Point, Wis. The proposals herein were formulated after consultation with the investigators of the Natural Resource and Biological Assessment on Sec. 28, T.24N., R.8E. and research done by the Council.

The Environmental Council is opposed to the creation of a new roadbed where other alternatives already exist. This will only serve to divide a useful tract of wooded land. We recommend that Maria Dr. and Reserve St. north of campus be used to route traffic from Michigan Ave. to the industry to the north of town. These existing roads could serve well as the base for an improved roadway.

In light of the fact that the proposed Michigan Ave. extention has been approved, planned and ,at this point seems inevitable , the Environmental Council makes the following demands which we believe will minimize the impact on the adjacent land.

The Micnigan Ave. extention...

1) must have a roadbed not to exceed 66 ft. in width.

2) must consist of one lane in each direction, without any areas for parking or stopping other than for emergency purposes, along it's length.

3) must have a maximum speed limit of 25 mph.

4) must have no access roads except an area from the proposed lake site. This access road is to exist only as long as the movement of landfill is necessary.

5) must not be salted as a winter protective measure. Sand and crushed gravel are superior substitutes.

6) must be absent of artificial lighting except at intersections where necessary.

7) must not restrict existing water flow patterns along it's course.

8) must have shoulder areas planted in lowlying shrubs to provide a buffer between the adjacent wooded areas.

9) must be diverted from the existing plan to continue due north, halfway through Curve 3 at mile 3.7 in order to avoid a mature stand of White Pine in the presently planned course.

Sincerely yours,

Steven J. Gutreuter