

Final 8/18/98

Environmental Assessment Worksheet

East Oaks Planned Unit Development

Sec. 4, 5, 6, 8, 9, 16, & 17, T30N, R22W & Sec. 6 & 12, T30N, R23W
North Oaks, Minnesota

August, 1998

Responsible Governmental Unit



City of North Oaks
100 Village Center Drive, Suite 150
North Oaks, MN 55127
Phone: (651) 484-5777
Fax: (651) 484-2712

Project Proposer



North Oaks Company
One, Pleasant Lake Road
North Oaks, MN 55127
Phone: (651) 484-3361
Fax: (651) 484-2704

Consultant



Westwood Professional Services, Inc.
7599 Anagram Drive
Eden Prairie, Minnesota 55344
Phone: (612) 937-5150
Fax: (612) 937-5822

ENVIRONMENTAL ASSESSMENT WORKSHEET

East Oaks Planned Unit Development

Proposer

North Oaks Company
Mr. Richard E. Leonard
One, Pleasant Lake Road
North Oaks, MN 55127
Phone (651) 484-3361
Fax (651) 484-2704

RGU

City of North Oaks
Ms. Nancy P. Rozycki
City Clerk
100 Village Center Drive, Suite 150
North Oaks, Minnesota 55127
Phone (651) 484-5777
Fax (651) 484-2712

Consultant

Westwood Professional Services, Inc.
7599 Anagram Drive
Eden Prairie, MN 55344
Phone (612) 937-5150
Fax (612) 937-5822

CONTENTS

	Page
East Oaks Planned Unit Development EAW	1
Exhibits and Appendices	

LIST OF EXHIBITS

	Exhibit
USGS Topography and Site Location.....	1
Aerial Photography and Concept Plan	2
Open Space, Parks, and Trails	3
Existing Conditions and Development Sites	4
Aerial Photography.....	5
Aerial Photography and National Wetlands Inventory Mapping.....	6
Shoreland Analysis	7
Existing Topography	8

LIST OF APPENDICES

	Appendix
Conservation Easement.....	A
Wildlife and Aquatic Plant Species Noted on Protected Land	B
DNR Natural Heritage Database Search	C
Conservancy Land Management Plan.....	D
Wetland Banking Credit Balance Correspondence.....	E
State Historic Preservation Office Correspondence.....	F

Environmental Assessment Worksheet (EAW)

East Oaks Planned Unit Development

NOTE TO PREPARERS

This worksheet is to be completed by the Responsible Governmental Unit (RGU) or its agents. The project proposer must supply any reasonably accessible data necessary for the worksheet, but is not to complete the final worksheet itself. If a complete answer does not fit in the space allotted, attach additional sheets as necessary.

For assistance with this worksheet contact the Minnesota Environmental Quality Board (EQB) at (612) 296-8253 or (toll-free) 1-800-652-9747 (ask operator for the EQB environmental review program) or consult "EAW Guidelines," a booklet available from the EQB.

NOTE TO REVIEWERS

Comments must be submitted to the RGU (see item 3) during the 30-day comment period following notice of the EAW in the EQB Monitor. (Contact the RGU or the EQB to learn when the comment period ends). Comments should address the accuracy and completeness of the information, potential impacts that may warrant further investigation, and the need for an EIS. If the EAW has been prepared for the scoping of an EIS (see item 4), comments should address the accuracy and completeness of the information and suggest issues for investigation in the EIS.

Public comments must be received by the City of North Oaks by 4:30 p.m. on September 23, 1998.

1. Project Title East Oaks Planned Unit Development (PUD)

2. Proposer North Oaks Company
Contact person Mr. Richard E. Leonard
Address One, Pleasant Lake Road
North Oaks, MN 55127
Phone (651) 484-3361 Fax (651) 484-2704

3. RGU City of North Oaks
Contact person Ms. Nancy P. Rozycki
and title City Clerk
Address 100 Village Center Drive, Suite 150
North Oaks, MN 55127
Phone (651) 484-5777 Fax (651) 484-2712

4. Reason for EAW Preparation

☐ EIS Scoping ☒ Mandatory EAW ☐ Citizen Petition ☐ RGU Discretion ☐ Proposer Volunteered

If EAW or EIS is mandatory give EQB rule category numbers(s) 4410.4300 Subp. 19.D.

5. Project Location

Sections 4, 5, 6, 8, 9, 16, and 17, T30N, R22W and Sections 6 and 12, T30N, R23W
County Ramsey City/Twp North Oaks

Attach copies of each of the following to the EAW:

- a county map showing the general location of the project;
- copy of USGS 7.5 minute, 1:24,000 scale map indicating the project boundaries;
- a site plan showing all significant project and natural features.

6. **Description** Give a complete description of the proposed project and ancillary facilities (attach additional sheets as necessary). Emphasize construction and operation methods and features that will cause physical manipulation of the environment or produce wastes. Indicate the timing and duration of construction activities.

Project Description

East Oaks Planned Unit Development is a multiple-phased development proposed by the North Oaks Company to provide 645 residential units and approximately 109,770 square feet of commercial development distributed among 12 Development Sites that encompass a total of 780 acres in North Oaks, Minnesota. Residential development will include single-family lots, duplexes (twinhomes), and multi-family dwellings. Future market conditions will dictate the types of homes constructed, but the number of residential units will not exceed 645. Residential homes will be developed and constructed in accordance with City of North Oaks Zoning Ordinances and distributed among the 12 Development Sites listed in the table below. Concept Plans discussed in this EAW may be subject to revisions involving the types of residential units, the specific locations of buildings, and the distribution of commercial development among Development Sites E, G, and H.

The project also includes 886 acres of Protected Land to be managed under a 621-acre Conservation Easement and a 265-acre Agricultural Land Easement, both to be conveyed to the Minnesota Land Trust. The Agricultural Land Easement will include a 45-acre Allowable Building Area that includes the Hill Residence and Farmstead. The entire project area encompasses about 1,666 acres located in Sections 4, 5, 6, 8, 9, 16, and 17, T30N, R22W and parts of Sections 6 and 12, T30N, R23W, City of North Oaks, Ramsey County (Exhibit 1). Eleven of the Development Sites are located in the northern and eastern portions of the City of North Oaks, and one area is located north of Charley Lake in the northwest portion of the city (Exhibit 2). The site is bounded on the north by County Road J and the cities of Shoreview and Lino Lakes, on the east by Centerville Road and White Bear Township, and on the southwest by existing residential development within the City of North Oaks. The project components are summarized in the following tables.

Development Sites Within the East Oaks Planned Unit Development						
Development Site	Size (acres)	Zoning	Residential Units	Possible Types of Residential Units	Commercial Floor Space ¹ (square feet)	Gross Density (residential units/acre)
A - Peterson Place	82	RMM	40	Single, Twin	0	0.49
B - Preserve East	6	RSM	2	Single	0	0.33
C - Nord	51	RSM	10	Single	0	0.20
D - Rapp Farm	110	RMH	200	Single, Twin, Multi	0	1.82
E - East Wilkinson	98	RCM	110	Single, Twin, Multi	78,408	1.12
F - Andersonville	35	RSM	10	Single	0	0.29
G - Gate Hill	32	RCM	68	Single, Twin, Multi	15,681	2.13
H - Island Field	22	RCM	35	Single, Twin, Multi	15,681	1.59
I - West Deer Hills	97	RSM	54	Single	0	0.56
J - Ski Hill	13	RSM	7	Single	0	0.54
K - West Black Lake	194	RSL	64	Single	0	0.33
L - South Deer Hills	40	RMH	45	Single, Twin	0	1.13
Total	780		645		109,770	Mean = 0.88

¹ The project will include up to 21 acres of Commercial Development, which is expected to include Retail, Office, and possibly Restaurant. Based on a Floor Area Ratio of 12%, this equates to 109,770 square feet of commercial floor space. The distribution of commercial floor space could vary from that shown in this table.

Protected Land Within the East Oaks Planned Unit Development			
Classification	Size (acres)	Wetland/Lake Acres	Upland Acres
Agricultural Land ¹	220	181	39
Allowable Building Area ¹	45	9	36
Conservation Easement	621	402	219
Total	886	592	294

¹ The Agricultural Land and the Allowable Building Area both fall within the area to be protected under the Agricultural Land Easement.

Approximately 127 acres of land within proposed Development Site K (West Black Lake) was previously approved for development of 30 single family homes under the *West Black Lake Subdivision EAW* (McCombs Frank Roos Associates, 1993), which was prepared to assess the environmental effects of development of 110 single family homes on 241 acres.

North Oaks Company retained Mr. Randall G. Arendt to design the project in an environmentally sensitive manner. Mr. Arendt is vice president of conservation planning at the Natural Lands Trust, based in Media, Pennsylvania. In his book, *Conservation Design for Subdivisions: A Practical Guide to Creating Open Space Networks* (Island Press, 1996), Mr. Arendt advocates a step-by-step approach to conserving natural areas by rearranging the density of developments during the planning process so that half or less of the buildable land is turned into streets and building pads. This process was applied during the design of the Development Sites that make up the East Oaks Planned Unit Development. Development Sites and building pads have been clustered in the least ecologically sensitive areas to minimize effects on the environment. Many of the clustered developments will be constructed in open fields. Street easements have been narrowed from the typical standard widths to minimize grading and impervious surface areas. Development densities also reflect environmental sensitivity. Unsewered single family lots will average approximately two to three acres in size. Densities of sewer residential developments will be clustered along the streets, and considerable portions of the Development Sites will be maintained in open space under the authority of the Home Owners Associations.

In addition to the 886 acres of Protected Land, the project will include a system of active and passive use recreational parks (Exhibit 3). Active use parks will be located in Development Sites A (Peterson Place), D (Rapp Farm), E (East Wilkinson), and K (West Black Lake). Passive open space areas will be incorporated into the design for Development Sites A (Peterson Place), B (Preserve East), and C (Nord). The Planned Unit Development will also include a substantial trail system that will wind through the Protected Land and connect to the Development Sites. The project includes a possible six-mile canoe route that would connect Deep, Wilkinson, and Black Lakes and approximately 11 miles of proposed trails (Exhibit 3). Trail construction will be confined almost entirely to existing field roads to minimize disturbance.

Under the easements to be conveyed to the Minnesota Land Trust, use of the 886-acre Protected Land area will be restricted to an interpretative center, administrative and sales office, row crops, animal production (i.e. horses, deer), greenhouses, horticultural facilities, tree nurseries, equipment storage, trail construction, general maintenance, wildlife management and research, and forest management activities. A potential interpretative center and administrative and sales offices will be confined within the 45-acre Allowable Building Area. Row crops, animal production (i.e., horses, deer), greenhouses, horticultural facilities, and tree nursery uses will be confined primarily to the 220-acre Agricultural Land area. The 621-acre Conservation Easement area will remain undeveloped and will be used only for education, research, habitat management, and recreation (canoe route and trails).

The project is consistent with the *North Oaks Comprehensive Plan Update* (McCombs Frank Roos Associates, 1998), which received concept approval from the City Council June 11, 1998 and was transmitted to the Metropolitan Council for review on July 23, 1998.

Site Description

The site includes seven major land cover types: (1) wetland, (2) deciduous woodland, (3) grassland, (4) impervious surface (i.e. paved roads, buildings), (5) lakes, (6) a concrete and sand stockpile, and (7) a tree nursery (Exhibit 4). Approximately 48 percent of the entire 1,666 acres is mapped as wetland and lake, and the remaining 52 percent is dominated by deciduous woodland and grassland. Wetland types present include seasonally flooded basins (Type 1), wet meadows (Type 2), shallow marshes (Type 3), deep marshes (Type 4), open waters (Type 5), shrub swamps (Type 6), and wooded swamps (Type 7). Wetland types 2, 3, and 6 are the most abundant wetland types on the property. Some wetland areas, although appearing to be relatively undisturbed, have been manipulated at some point in the past. Historic impacts include evidence of grazing and ditching in some areas. Invasive species such as reed canary grass are prevalent throughout many wetland and wetland fringe areas.

The majority of deciduous woodland consists of mature oak forest with an understory of common buckthorn. Green ash, trembling aspen, basswood, and birch are also common in isolated areas. Remnant patches of big bluestem exist in areas where sunlight penetrates the canopy. Oak wilt is prevalent, and the City operates an oak wilt control program through a contract with a professional forester. Due to overbrowsing by the abundant resident deer herd and past management practices, much of the ground under the canopy is bare. Very little oak regeneration is occurring. The most prevalent forb growth is white snakeroot. Grasslands and crop field areas are subject to varying degrees of agricultural activity, from frequent to occasional production of small grain crops (buckwheat, oats, etc.) or haying. Grasslands that are not currently used for agricultural purposes are dominated by species such as smooth brome, reed canary grass, horseweed, and timothy. There is a profuse growth of spotted knapweed in and near Development Site J. The stockpile located in Development Site D consists primarily of concrete and sand that will be recycled for use in future development. The small amount of impervious surface present on the site includes a few buildings and some paved roads and driveways.

Other significant features of the site include several fenced deer exclosures that are intended to keep the resident deer herd from damaging certain trees. A large control structure/fish barrier is present at the outlet on the west shore of Wilkinson Lake in the northeast portion of the site. The structure contains eight adjustable weirs and is used to stabilize water levels and prevent rough fish from entering Wilkinson Lake. Unpaved field roads and trails provide access for land management activities (forestry, wildlife, etc.) throughout the property. Old livestock fences are still present from prior farming activities.

Impacts, Timing, and Mitigation

Project construction will occur in phases in response to market conditions. Project construction is expected to begin in the spring of 1999 and full development of the site is expected to occur in 20 to 30 years. The area exposed to erosion at any one time will be minimized because most of the 12 Development Sites are physically separated and their construction will likely occur at different times. Construction phasing will be implemented for larger Development Sites to further minimize the area exposed to erosion. Erosion control measures will be implemented to minimize construction-related runoff and erosion and to comply with the General NPDES (National Pollutant Discharge Elimination System) Permit for construction activities. Mass grading will be restricted almost entirely to roadways and building pads located in open fields. Grading for individual lots will be minimized and avoided if feasible. A determination of the amount of grading (if any) required for lots will be made on a lot-by-lot basis. Custom designed homes and custom-graded lots will be standard practices in single-family developments proposed in wooded areas. City of North Oaks Subdivision and Zoning Ordinances require that consideration be made at the time of subdivision to ensure that each lot has a suitable building site without materially changing existing contours. The Protected Land will be covered by Conservation and Agricultural Easements that prohibit building, vegetation alteration, surface grading, or any activity that would destroy, interfere with, or alter the general character of the described section of property.

City of North Oaks Subdivision and Zoning Ordinances also require marking and actively protecting trees in areas under construction. Easements on many existing properties throughout North Oaks prohibit trimming or cutting trees without appropriate permission from local authorities. Most of these restrictions will apply to areas within the East Oaks Planned Unit Development. Measures will be taken to control oak wilt during project construction. Typical oak wilt control practices include: (1) applying appropriately performed and timed construction practices in areas with oak co-types, (2) promptly removing dead and diseased oaks, and (3) containing oak wilt spread by use of chemical barriers or trenching with a vibratory plow.

The project is expected to convert approximately 210 acres of grassland and 83 acres of deciduous woodland to a combination of urban landscaping, homes, streets, parking areas, stormwater ponds, and other typical components of residential developments (Exhibit 2). Development Sites B, C, and K (Preserve East, Nord, and West Black Lake) will include substantial areas of woodland preservation within the backyards of single family lots that will average two to three acres in size. The woodland to be preserved in these sites will become more fragmented as a result of development. Seven of the 12

Development Sites will include wetland fill associated with road crossings. Total wetland fill is estimated at 0.35 acres.

The preservation of approximately 445 acres of deciduous woodland, 573 acres of wetland, 221 acres of lake, and 95 acres of grassland is expected to mitigate adverse ecological effects to the extent practicable. It is anticipated that mitigation for wetland impacts will be provided by some of the 0.5 acres of New Wetland Credit (wetland creation) and the 5.1 acres of Public Value Credit (upland buffer) available from state-approved wetland banks owned by North Oaks Company and located in Development Sites D (Rapp Farm) and F (Andersonville). Mitigation for the other proposed land use conversions and associated impacts include: (1) pre-treatment of stormwater runoff in detention basins designed to meet NURP (Nationwide Urban Runoff Program) criteria, (2) implementation of erosion control measures during construction, (3) spatial and temporal separation of construction of development phases, (4) preservation and protection of 886 acres of land, and (5) continued forest and wildlife management on Protected Land. Specific management goals of the proposed Conservation Easement area include: (1) control of noxious and non-native plants, (2) restoration of native ecosystems, (3) enhancement of fish and wildlife habitat, (4) environmental education, and (6) natural resource research.

Provide a 50 or fewer word abstract for use in EQB Monitor notice:

East Oaks Planned Unit Development is proposed to provide 645 residential units, and 109,770 square feet of commercial development distributed among 12 Development Sites on 1,666 acres in North Oaks, Minnesota. Plans include preservation of 886 acres of Protected Land under conservation and agricultural easements.

7. Project Magnitude Data

Total Project Area (acres) 1,666 or Length (miles) N/A

Residential (lots/units) 645

Commercial / Industrial / Institutional Building Area (gross floor space)

Total 109,770 square feet;

Indicate area of specific uses:

Office or Retail 109,770¹

Manufacturing N/A

Retail N/A

Other Industrial N/A

Warehouse N/A

Institutional N/A

Light Industrial N/A

Agricultural N/A

Other Commercial (specify) N/A

Building Height(s) < 35 feet on standard lots and in shoreland districts

< 45 feet (by Conditional Use Permit) on walkout lots or other designated areas

¹ The 109,700 square feet of gross commercial floor space is based on 21 acres of commercial land use and a 12% floor area ratio.

8. Permits and Approvals Required List all known local, state, and federal permits, approvals, and funding required:

Unit of Government	Type of Application/Permit/Approval	Status
City of North Oaks	Rezoning	Application submitted
City of North Oaks	PUD Approval	Application submitted
City of North Oaks	Comprehensive Plan Update	Concept approved 6/11/98
Metropolitan Council	North Oaks Comprehensive Plan Update	Application submitted
City of North Oaks	Preliminary Plan Approval	Application submitted
City of North Oaks	EAW Negative Declaration	To be applied for
City of North Oaks	Final Plats	To be applied for
City of North Oaks	Grading Permits	To be applied for
City of North Oaks	Building Permits	To be applied for
City of Shoreview	Municipal Water Connection Permit	To be applied for

Unit of Government	Type of Application/Permit/Approval	Status
City of Shoreview	Sanitary Sewer Connection Permit	To be applied for
White Bear Township	Municipal Water Connection Permit	To be applied for
White Bear Township	Sanitary Sewer Connection Permit	To be applied for
Vadnais Lake Area WMO	Certificate of Wetland Replacement	To be applied for
Vadnais Lake Area WMO	Grading and Stormwater Management	To be applied for
Ramsey County Highway Department	Permits for Connections to County Roads	To be applied for
Metropolitan Council	Sanitary Sewer Connection Permit	To be applied for
Minnesota DNR Division of Waters	Temporary Water Appropriation Permit	To be applied for
Minnesota DNR Division of Waters	Shoreland PUD Variances	To be applied for
Minnesota Department of Health	Site Plumbing Permit	To be applied for
Minnesota Department of Health	Watermain Extension	To be applied for
Minnesota Pollution Control Agency	NPDES Permit	To be applied for
Minnesota Pollution Control Agency	Utility Extension	To be applied for
Minnesota Pollution Control Agency	Section 401 Water Quality Certification	To be applied for
U.S. Army Corps of Engineers	Section 404 Permit(s)	To be applied for

All required permits and approvals will be obtained. If any necessary permits or approvals are not listed in the above table, their omission is unintentional.

9. **Land Use** Describe current and recent past land use and development on the site and on adjacent lands. Discuss the compatibility of the project with adjacent and nearby land uses; indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazard due to past land uses, such as soil contamination or abandoned storage tanks.

Current and Past Land Use

Current unforested portions of the project site correspond to areas of historical agricultural use, wetlands, and lakes. The remainder of the site is wooded with upland deciduous trees (oak, aspen, maple, and basswood), some shrub swamps, and forested wetlands. The area to be conveyed under the Conservation Easement (Appendix A) was part of one of the earliest experimental farms in Minnesota. In 1883, James J. Hill purchased the original 3,000 acres of traditional farmland, which he then used for experiments in animal management and to study various feeds and fertilizers.

Current operations include sixteen small tree nurseries, various farming activities, and land/water restoration projects. The Conservancy Land to be put into easement in connection with the proposed project consists of approximately 621 acres of land that includes areas of mixed hardwood forest, wetlands, and lakes. An additional 220 acres of agricultural land and 45 acres of allowable building area that includes the Hill Residence and Farmstead will be conveyed under an Agricultural Easement in connection with this project. The entire City of North Oaks is currently designated as a State Game Refuge, with no allowable hunting, fishing or trapping.

Adjoining land south of the project falls within the City of North Oaks and supports residential development (Exhibit 5). Adjoining land north of Development Site A (Peterson Place) is located in the City of Shoreview and is developed for residential use. The area north of Development Site C and west of Development Site D is located in White Bear Township and undeveloped. The area north of Development Sites D and E is located in the City of Lino Lakes and is primarily undeveloped. The area east of the project falls in White Bear Township and supports a combination of industrial development, commercial development, residential development, and undeveloped land. The City of North Oaks is bounded on all sides by State and County State Aid Highways (CSAHs), including State Highway 96, State Highway 49, County Road J, and CSAH 4.

The *City of North Oaks 1998 Comprehensive Plan - Draft 4* (McCombs Frank Roos Associates, May 21, 1998) shows the majority of the site guided for recreation/open space and residential development, and a small area in the northeast corner of the project guided for commercial development. The proposed project is compatible with the City of North Oaks Comprehensive Plan and adjacent adjoining land uses. No land use conflicts are anticipated.

Environmental Conditions

Records obtained by B.A. Liesch Associates during the execution of a Phase I Environmental Site Assessment for the property indicate the project area includes or formerly included nine above ground or underground storage tanks. These tanks are listed in the following table.

Three of these tanks are included in the Minnesota Pollution Control Agency's (MPCA's) Leaking Underground Storage Tank (LUST) site list. Tank Number 002 was located at the Old Farmstead within Development Site I (Exhibit 4) and corresponds to LUST site 3384. The tank was removed in 1990 and a report on the contamination has been submitted to the MPCA. LUST site 3384 will continue to be coordinated with the MPCA, and remediated if necessary, until the MPCA closes this file and determines that the contamination has been adequately addressed. Tank Number 004 was located at the Hill Residence and corresponds to LUST site 3962. The tank was removed in 1991 and the MPCA has closed this file, indicating that contamination associated with the leak has been adequately addressed. Tank Number EEE is located at the Hill Residence and corresponds to LUST site 9928. The tank has been abandoned and filled with soil, and the MPCA has closed this file, indicating that the contamination has been adequately addressed.

The tanks that remain active are located within the allowable building area of the Agricultural Easement and will not be affected by the proposed development. It is not anticipated that the proposed developments will involve the installation of additional above or underground storage tanks.

Registered Above Ground and Underground Storage Tanks located within the East Oaks PUD.						
Tank Number	Above or Underground	Date Installed	Location ¹	Status	Substance Stored	Capacity
002	Underground	Unknown	Old Farmstead	Removed 10/12/90	Fuel Oil	1,000
003	Underground	01/09/91	Hill Farmstead	Active	Unknown	3,000
004	Underground	Unknown	Hill Residence	Removed 04/29/91	Gasoline	1,000
005	Underground	09/01/80	Hill Residence	Active	Fuel Oil	4,000
01A	Underground	Unknown	Hill Farmstead	Removed 10/12/90	Gasoline	2,000
1001	Above Ground	Unknown	Hill Farmstead	Active	Waste Oil	265
CCC	Underground	09/01/80	Hill Farmstead	Active	Diesel Fuel	1,000
EEE	Underground	Unknown	Hill Residence	Abandoned/Filled	Fuel Oil	1,000
FFF	Underground	Unknown	Hill Farmstead	Active	Diesel Fuel	500

¹ See Exhibit 4 for the location of the Old Farmstead, Hill Farmstead, and Hill Residence.

The project area includes 11 known wells, which have been located by Kurth Surveying, Inc. and are described in the following table. Six of the known wells have been sealed and abandoned, and five wells are currently active. The five active wells are operated in support of activities located at the Hill Residence and Farmstead, located within the Allowable Building Area covered under the proposed Agricultural Easement (Exhibit 4). These wells will remain active and continue to be used for domestic water. Any additional domestic wells identified in the Development Sites will be sealed and abandoned in compliance with Minnesota Department of Health regulations.

Wells Identified within the East Oaks PUD				
Development Site	Unique Well Number	Well Status	Date Sealed	Notes
A - Peterson Place	H23719	Sealed/Abandoned	8/21/92	house - demolished
I - West Deer Hills	H40140	Sealed/Abandoned	9/25/93	house - demolished
I - West Deer Hills	H40141	Sealed/Abandoned	9/25/93	house - demolished
J - Ski Hill	173913	Sealed/Abandoned	6/6/92	house - demolished
K - West Black Lake	---	Active	---	well in small shed near easement boundary
K - West Black Lake	---	Active	---	well house near windmill
Agricultural Easement	---	Recently Sealed	1998	under windmill, west of farm buildings
Agricultural Easement	---	Active	---	hand pump in yard
Agricultural Easement	014272	Active	---	L.W. Hill, Jr. Homestead
Agricultural Easement	---	Active	---	Rollie Peterson Home
Agricultural Easement	---	Recently Sealed	1998	filled w/rocks in 1930's; N. of Wilkinson Lake outlet

10. Cover Types Estimate the acreage of the site with each of the following cover types before and after development (before and after totals should be equal):

Estimated Pre-Development Land Cover in Development Sites													
Land Cover	Development Site ¹												Total
	A	B	C	D	E	F	G	H	I	J	K	L	
Deciduous Woodland	7	2.75	29.5	9.5	11	18	3.5	0.5	47.5	6	161	5.5	301.75
Grassland	22	0	0	72	63	0	28	16	12	6	15	22	256
Wetland	48	3	21	17	16	16	0	5	37	1	16	11	191
Lake	4	0	0	0	7	0	0	0	0	0	0	0	11
Impervious Surface ²	1	0.25	0.5	1.5	1	1	0.5	0.5	0.5	0	2	1.5	10.25
Stormwater Ponding	0	0	0	0	0	0	0	0	0	0	0	0	0
Lawn & Landscaping	0	0	0	0	0	0	0	0	0	0	0	0	0
Concrete & Sand Stockpile	0	0	0	10	0	0	0	0	0	0	0	0	10
Total	82	6	51	110	98	35	32	22	97	13	194	40	780

¹ A = Peterson Place, B = Preserve East, C = Nord, D = Rapp Farm, E = East Wilkinson, F = Andersonville, G = Gate Hill, H = Island Field, I = West Deer Hills, J = Ski Hill, K = Black Lake North, L = South Deer Hills.

² Impervious surface includes streets, homes, buildings, driveways, and parking lots.

Estimated Post-Development Land Cover in Development Sites													
Land Cover	Development Site ¹												Total
	A	B	C	D	E	F	G	H	I	J	K	L	
Deciduous Woodland	7	1.8	21.5	9.5	10	7.5	3.5	0	25	4	124	5.5	219.3
Grassland	4.5	0	0	9.5	4	0	8.5	4.2	2	2	5	6.5	46.2
Wetland ²	48	3	21	17	16	16	0	5	37	1	16	11	191
Lake	4	0	0	0	7	0	0	0	0	0	0	0	11
Impervious Surface ³	5	0.4	3	21	26.5	1.5	6	3.3	6.3	2	18	4	97
Stormwater Ponding	1	0.1	1.5	3	5.5	1	1	1	3	0.5	6	1	24.6
Lawn & Landscaping	12.5	0.7	4	50	29	9	13	8.5	23.7	3.5	25	12	190.9
Concrete & Sand Stockpile	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	82	6	51	110	98	35	32	22	97	13	194	40	780

¹ A = Peterson Place, B = Preserve East, C = Nord, D = Rapp Farm, E = East Wilkinson, F = Andersonville, G = Gate Hill, H = Island Field, I = West Deer Hills, J = Ski Hill, K = Black Lake North, L = South Deer Hills.

² Small areas of wetland impact within each development that collectively total 0.35 acres are not included in this table.

All wetland impacts will be replaced through the use of wetland banking credits available in Development Areas D and F.

³ Impervious surface includes streets, homes, buildings, driveways, and parking lots.

Note: Total Pre- and Post-Development Land Cover, including Protected Land, is summarized in the table on the following page.

Total Estimated Pre- and Post-Development Land Cover ¹						
Land Cover	Land Cover Before Development			Land Cover After Development		
	Development Sites	Protected Land	Total (acres)	Development Sites	Protected Land	Total (acres)
Deciduous Woodland	301.75	226.2	527.95	219.3	226.2	445.5
Tree Nursery	0	15.0	15.0	0	15.0	15.0
Grassland	256.0	49.0	305.0	46.2	49.0	95.2
Wetland	191.0	382.0	573.0	191.0	382.0	573.0
Lake	11.0	210.0	221.0	11.0	210.0	221.0
Impervious Surface	10.25	1.8	12.05	97.0	1.8	98.8
Stormwater Ponding	0	0	0.0	24.6	0	24.6
Lawn & Landscaping	0	2.0	2.0	190.9	2.0	192.9
Concrete & Sand Stockpile	10.0	0	10.0	0	0	0
Total	780.0	886.0	1666.0	780.0	886.0	1666.0

¹ Post-development land cover was approximated based on the Preliminary Concept Plans.

11. Fish, Wildlife, and Ecologically Sensitive Resources

- a. Describe fish and wildlife resources on or near the site and discuss how they would be affected by the project. Describe any measures to be taken to minimize or avoid adverse impacts.

Wildlife and fish habitat in the project area is directly related to vegetative cover and the amount of wetland, deciduous woodland, grassland, and lakes on the property (Exhibit 4). Wetland types present include seasonally flooded basins (Type 1), wet meadows (Type 2), shallow marshes (Type 3), deep marshes (Type 4), open water (Type 5), shrub swamps (Type 6), and wooded swamps (Type 7). Types 2, 3, and 6 are the most abundant wetland types on the property. Some wetland areas, although appearing relatively undisturbed, have been manipulated at some point in the past. Historic impacts include evidence of grazing and ditching in some areas. Invasive species such as reed canary grass are prevalent throughout many wetland and wetland fringe areas.

The majority of deciduous woodlands consist of mature oak forest with an understory of common buckthorn. Green ash, trembling aspen, basswood, and birch are common in isolated areas. Remnants of big bluestem exist in areas where sunlight penetrates the forest canopy. Oak wilt has been identified within the City of North Oaks and will be prevented, controlled, and treated as necessary in the project area through coordination with the City of North Oaks and the professional forester who operates the forestry program. Oak wilt control practices commonly include: (1) applying appropriately performed and timed construction practices, (2) promptly removing dead and diseased oaks, and (3) containing oak wilt spread by use of chemical barriers or trenching with a vibratory plow. Due to overbrowsing by the resident deer herd and past management practices, much of the ground under the canopy is very bare. Very little woody regeneration is occurring. The most prevalent forb growth is white snakeroot. Grassland areas consist of upland habitats that are subject to varying degrees of agricultural activity, such as frequent to occasional production of small grain crops (buckwheat, oats, etc.) and haying. Open field areas not currently used for agricultural purposes are dominated by species such as smooth brome, reed canary grass, spotted knapweed, horseweed, and timothy.

An extensive list of bird species, mammals, reptiles/amphibians, and aquatic plants observed on the 886 acres of Protected Land was compiled by the North Oaks Company biologist and is provided in Appendix B. Although there have not been extensive surveys of fish resources, it can be reasonably assumed that Wilkinson and Black Lake, as well as portions of Deep and Charley Lakes that occur on the property, provide habitat for populations of native fishes. Significant efforts have been made to prevent rough fish from entering Wilkinson Lake by installation of a fish barrier at the outlet located on the west shore of the lake.

The project is expected to convert approximately 210 acres of grassland and 83 acres of deciduous woodland to a combination of urban landscaping, homes, streets, parking areas, stormwater ponds, and other typical components of residential developments (see Exhibits 2, 4, and 5). Development

Sites B, C, and K (Preserve East, Nord, and West Black Lake) will include substantial areas of woodland preservation within the backyards of single family lots that will average two to three acres in size. The woodland to be preserved in these sites will become more fragmented as a result of development. Proposed wetland impacts include a total of approximately 0.35 acres for road crossings. These habitat changes are expected to result in a decline in wildlife abundance within the 12 Development Sites, but the decline in wildlife abundance is not expected to be regionally significant. Wildlife species with large home ranges like white-tailed deer will likely respond to the development by adjusting their home ranges and habitat use patterns accordingly. Migratory birds are expected to respond to development by locating alternative nesting sites upon their return from wintering habitats. Non-migratory species with small home ranges, such as small mammals, will experience the most adverse effects. These species, which include meadow voles, shrews, and squirrels, will either compete with other individuals of the same species to claim territories in neighboring habitats or succumb to mortality during project construction.

The preservation of about 445 acres of woodland and 95 acres of grassland is expected to mitigate the loss of wildlife habitat associated with development. The proposed preservation of 886 acres of Protected Land will include about 226 acres of woodland and 49 acres of grassland that will be managed to improve wildlife habitat. Management objectives specified in Conservation Land and Agricultural Land easements include the continuation and expansion of wildlife research and management activities. About 219 acres of woodland and 46 acres of grassland is expected to be preserved within Development Sites. Specific wildlife and fishery-related activities identified in the easement agreements to accomplish management objectives include: (1) bird banding in cooperation with the U.S. Fish and Wildlife Service, (2) censusing of flora and fauna, (3) forest canopy studies, (4) wetland research, (5) ecosystem restoration, (6) control of exotic plant species, (7) controlled burning, (8) timber removal, (9) placement of wildlife nesting structures, (10) deer population control, and (11) maintenance of waterways, wetlands, and lakeshores.

- b. Are there any state-listed endangered, threatened, or special-concern species; rare plant communities; colonial waterbird nesting colonies; native prairie or other rare habitat; or other sensitive ecological resources on or near the site? ☒ Yes ☐ No If yes, describe the resource and how it would be affected by the project. Indicate if a site survey of the resources was conducted. Describe measures to be taken to minimize or avoid adverse impacts.

The Minnesota DNR Natural Heritage Program conducted a database search to determine if any records exist for occurrences of rare or endangered plants, animals, or communities on or near the site. The search identified 35 occurrences of rare species or natural communities in the area searched (Appendix C). As explained in the following discussion, the project is not expected to have significant adverse effects on the rare species or communities. Six of the 35 element occurrences were within the boundaries of the project. These six element occurrences include two records of water-willow, two records of cattail marsh communities, a rich fen (shrub subtype) community, and an oak forest (dry subtype) community. These six element occurrences fall within the 886-acre Protected Land area, with the exception of a portion of the oak forest community north of Black Lake.

The proposed project will not have a significant effect on the rare wetland plants and wetland communities that were identified in the database search and occur within the site. The two occurrences of water-willow, a state-listed Special Concern species, the rich fen, and the cattail marsh communities are all located within the Protected Land area. This property will be managed under a Conservation Easement intended to preserve and perpetuate the natural resources, including the populations of water-willow and the rich fen and cattail marsh communities. One location of water-willow is located approximately 1,500 feet from the nearest Development Site, and none of the identified wetland communities will be physically altered by the project. The rich fen and one cattail marsh are located just south of Development Site K (West Black Lake) and the other cattail marsh and occurrence of water-willow is associated with the marsh at the north end of Development Site K. Appropriate stormwater ponding and impervious surface runoff routing will be combined with large lot sizes and narrow streets in Development Site K to minimize the potential for indirect effects on the rich fen and cattail marsh communities.

The oak forest community element occurrence falls partially within the Conservation Easement area and partially within Development Site K. Over half of the 200-acre mapped oak forest community will be incorporated into the large-lot, unsewered single family residential development. Although much of this stand will be incorporated into back yards by the proposed development, woodland areas will be preserved by virtue of the large lot size. Development Site K includes about 161 acres of woodland. Construction of streets and 64 single family homes is expected to convert about 37 acres of woodland to developed uses, and the remaining 124 acres of woodland will become more fragmented. DNR records indicate the oak forest community has been impacted by extreme deer browsing, with a resulting elimination of reproduction of canopy trees and poor forb species diversity. The community was assigned an Element Occurrence ranking of "C/D" by the DNR, which is typical of sites that have been grazed, logged, or have an understory or forb layer that lacks ecological integrity. The proposed preservation of 226 acres of woodland within the Conservation Easement area, combined with proper forest and wildlife habitat management, is expected to mitigate for the loss of a portion of the mapped oak forest community.

The DNR identified eight additional occurrences of rare species or communities that are outside the project boundaries, but that they considered among the most likely to be impacted by the proposed project. These occurrences include four Blanding's turtle sightings (a state-listed threatened species), a red-shouldered hawk sighting (a state-listed special concern species), an acadian flycatcher sighting (a state-listed special concern species), a cattail marsh community, and a willow swamp community. The willow swamp and cattail marsh communities lie outside the project boundaries near Long Lake. They will not be affected by the proposed project because no additional development will occur near these communities and because stormwater management and erosion control measures will prevent waters connected to these wetland communities from being adversely impacted. The six rare records of rare wildlife species are addressed individually below. Blanding's turtles, red-shouldered hawks, and acadian flycatchers may use existing habitats on the subject property even though there have been no documented sightings within project boundaries.

Of the four records of Blanding's turtles nearest to the project, two occurred in North Oaks and two occurred in the City of Shoreview north of Development Site A. The two records in North Oaks were located near Deep Lake and Teal Pond, in areas that were previously developed. The Natural Heritage database search reported 12 other observations of Blanding's turtles that occurred at distances ranging between one-third and three miles from the project site. According to *Minnesota's Endangered Flora and Fauna* (Coffin and Pfannmuller, 1988) Blanding's turtles prefer calm shallow water, rich aquatic vegetation, and select open (i.e., grassy) uplands with sandy soils for nesting. Mr. John Moriarty, wildlife biologist with Hennepin Parks and local Blanding's turtle expert, indicated that the best Blanding's turtle habitat includes large wetlands or wetland complexes larger than 10 acres that are surrounded by open sandy uplands. Because Blanding's turtles have been known to travel up to 1.5 miles between wetlands and nest sites, he suspects the turtles may need 500 to 600 acres of undisturbed habitat to sustain long-term viable populations.

It is plausible that a viable population of turtles could be sustained within the 886 acres of Protected Land. Several of the construction and design guidelines listed by the DNR will be implemented during construction of the 12 Development Sites. The project will feature 24 foot wide roads to reduce potential impacts on turtle mobility. Consideration will be given to use of surmountable curbs in street construction to accommodate turtle mobility. Silt fence will be installed adjacent to wetlands prior to earthwork near wetland edges, and the silt fence will be removed after vegetation is established. Many wetlands will be protected by a wide buffer of undisturbed vegetation so that silt fence at the wetland edge will be unnecessary. Wetlands will not be excavated and the landscaping and terrain will be left in a natural state. Wetland impacts in the 780 acres of Development Sites will be limited to minor road crossings totaling 0.35 acres. The 886 acres of Protected Land will include 592 acres of wetlands and lakes and 49 acres of grassland, and approximately 46 acres of additional grassland preservation is expected within the Development Sites. Preservation and management of the Protected Land, combined with open space within the Development Sites, is expected to preserve potential Blanding's turtle habitat in the project area.

The DNR database included one record of a red-shouldered hawk nesting observation made in a residential area near the east shore of Pleasant Lake in 1993. Coffin and Pfannmuller (1988) describe the preferred habitat of red-shouldered hawks as moist lowland woods and river bottoms, typically with a minimum of 123 ha (308 acres) of floodplain forest. Numerous small hunting areas, usually marshes and meadows, are also important. The project site does not contain floodplain forest, but it does provide forested wetland habitat and numerous shallow to deep marshes that provide potential hunting areas for red-shouldered hawks. The clustered developments proposed in the areas to be served by municipal sewer and water will reduce potential effects on red-shouldered hawks that might have occurred under a more traditional development design. The large single family lots proposed for development in Site K will provide habitat similar to the residential area where red-shouldered hawks were observed in 1993. The preservation of 886 acres of land within the Conservation and Agricultural Easement areas, combined with proper forest and wildlife management practices on these lands, is expected to maintain potentially suitable habitat for red-shouldered hawks in the project area.

In 1992, a breeding record of acadian flycatchers was documented northeast of the intersection of East Oaks Road and North Oaks Road. Acadian flycatchers have been known to breed in Minnesota only since about 1950. According to *Birds in Minnesota* (Janssen, 1987), the species began expanding its range north and west from the southeast corner of Minnesota in the 1970s. The DNR added the acadian flycatcher to the state list of special concern species since 1993. Because the Twin Cities metropolitan area appears to be the northern edge of its range in Minnesota, abundant acadian flycatchers would not be expected. According to the DNR, acadian flycatchers prefer deciduous floodplain or bottomland forests with deep shade. Forests with little undergrowth are preferred. Much of the deciduous woodland on the site has little undergrowth due to the severe deer browsing. These woods could provide habitat for acadian flycatchers. Because many Development Sites are primarily located on non-wooded portions of the project area, it is expected that impacts to potential acadian flycatcher habitat will be minimal. The portion of the project nearest to the acadian flycatcher observation site will be included in the Protected Land and will not be affected by the project. Forest and wildlife management practices to be implemented in the Protected Land area may include measures to enhance and preserve areas suitable for acadian flycatchers.

The eight remaining element occurrences listed in the DNR database search include one plant species (tooth-cup), six plant communities, and a gopher snake, which is a state-listed special concern species. These eight rare plant and rare plant communities were documented outside the project boundaries and the City of North Oaks, and therefore will not be affected by the proposed development. The gopher snake was recorded about six miles west of the project and that habitat will not be affected by the proposed development.

12. **Physical Impacts on Water Resources** Will the project involve the physical or hydrologic alteration (dredging, filling, stream diversion, outfall structure, diking, impoundment) of any surface water (lake, pond, wetland, stream, drainage ditch)? ☒ Yes ☐ No If yes, identify the water resource to be affected and describe: the alteration, including the construction process; volumes of dredged or fill material; area affected; length of stream diversion; water surface area affected; timing and extent of fluctuations in water surface elevations; spoils disposal sites; and proposed mitigation measures to minimize impacts.

The project area includes all or parts of four lakes and numerous wetlands. According to the wetland inventory prepared by the Ramsey Soil and Water Conservation District for the Vadnais Lake Area Water Management Organization (VLAWMO) *1987 Watershed Management Plan*, the City of North Oaks includes approximately 190 wetlands. Of these, 47 wetlands are over 2.5 acres in size. Wetlands in the project area were mapped on aerial photographs during site reviews by Mr. Bob Fashingbauer, the North Oaks Company biologist. Mapped wetland boundaries were digitized by Kurth Surveying, Inc., and the resulting wetland mapping is shown on Exhibit 4. The project area wetland mapping corresponds reasonably well with National Wetlands Inventory mapping (Exhibit 6). The project area wetland mapping indicates that wetlands and lakes account for 26 percent of the Development Sites (202/780 acres) and 67 percent of the Protected Land (592/886 acres).

According to the North Oaks Company *Conservancy Land Management Plan* (November, 1997, see Appendix D), Wilkinson Lake is the only lake included completely within the project area, and it will be contained within the Protected Land. The lake reportedly has an average depth of 2 to 3 feet, and the open water area is encircled by a dense stand of cattails and a fringe of reed canary grass. Wilkinson Lake is used by 22 species of waterfowl during spring and fall migrations. Great blue heron, great egret, belted kingfisher, and green heron are common residents throughout the spring, summer, and fall. Summer waterfowl include mallard, hooded merganser, wood duck, and blue winged teal. Water-willow (*Decodon verticulatus*), a state-listed special concern species, is present in small amounts. Concept Plans prepared for the 12 Development Sites involve a total of approximately 0.35 acres of wetland fill. All wetland impacts will be necessary to construct road crossings that will provide access to portions of the various Development Sites. An estimate of proposed wetland impacts by Development Site is shown in the following table. Wetland boundaries will be delineated in the field by North Oaks Company, approved by VLAWMO, and located by land surveyors prior to wetland permit application so that wetland impacts can be precisely quantified.

Wetland Impacts Anticipated for East Oaks PRD			
Development Site	Total Area of Wetland and Lake (acres)	Proposed Wetland Fill Area (acres)	Type of Wetland Fill (Circular 39)
A	52	0.02	1
B	3	0	N/A
C	21	0.03	2
D	17	0.14	2
E	23	0.01	2
F	16	0	N/A
G	0	0	N/A
H	5	0.06	2
I	37	0	N/A
J	1	0	N/A
K	16	0.06	2
L	11	0.03	2
Total	202	0.35	

The project proposer has carefully designed each Development Site to avoid wetlands to the greatest extent feasible. This consideration has resulted in concept designs that allow for 645 residential units and 109,770 square feet of commercial development within a 780-acre Development Site that is 26 percent wetland and lake. The proposed wetland fill constitutes less than two-tenths of one percent of the total wetland and lake area within the Development Sites. No wetland impacts are proposed below the Ordinary High Water Level of any DNR Protected Waters.

The project proposer will still be required to follow the sequencing process of wetland avoidance, minimization, rectification, and mitigation as outlined in the Minnesota Wetland Conservation Act (WCA) of 1991, as amended. Wetland permit applications will be prepared and submitted to the Vadnais Lake Area Water Management Organization (VLAWMO) and the St. Paul District of the Corps of Engineers to obtain authorization for wetland fill under the WCA and Section 404 of the Federal Clean Water Act prior to project construction. Erosion control measures, best management practices, and the use of stormwater ponds for rate control and water quality treatment will prevent indirect impacts to lakes and other wetlands within and adjacent to the Development Sites.

Replacement for the proposed wetland fill will most likely be provided by debiting the North Oaks Company wetland bank. Correspondence from the VLAWMO concerning the status of North Oaks Company wetland banking credit is included in Appendix E. The state-approved wetland bank has a balance of 0.5 acres of New Wetland Credit (wetland creation) and 5.1 acres of Public Value Credit (wetland restoration) from activities carried out on Development Sites D (Rapp Farm) and F (Andersonville). The project proposer has not eliminated the possibility that additional wetland creation might be proposed to compensate for some or all of the proposed wetland fill.

13. Water Use

- a. Will the project involve the installation or abandonment of any wells? ☒ Yes ☐ No
For abandoned wells give the location and Unique well number. For new wells, or other previously unpermitted wells, give the location and purpose of the well and the Unique well number (if known).

The project area includes 11 known wells, which have been located by Kurth Surveying, Inc. and are described in the following table. Six of the known wells have been sealed and abandoned, and five wells are currently active. The five active wells are operated in support of activities located at the Hill Residence and Farmstead, located within the Allowable Building Area covered under the proposed Agricultural Easement (Exhibit 4). These wells will remain active and continue to be used for domestic water. Any additional domestic wells identified in the Development Sites will be sealed and abandoned in compliance with Minnesota Department of Health regulations.

Wells Identified within the East Oaks PUD				
Development Site	Unique Well Number	Well Status	Date Sealed	Notes
A - Peterson Place	H23719	Sealed/Abandoned	8/21/92	house - demolished
I - West Deer Hills	H40140	Sealed/Abandoned	9/25/93	house - demolished
I - West Deer Hills	H40141	Sealed/Abandoned	9/25/93	house - demolished
J - Ski Hill	173913	Sealed/Abandoned	6/6/92	house - demolished
K - West Black Lake	---	Active	---	well in small shed near easement boundary
K - West Black Lake	---	Active	---	well house near windmill
Agricultural Easement	---	Recently Sealed	1998	under windmill, west of farm buildings
Agricultural Easement	---	Active	---	hand pump in yard
Agricultural Easement	014272	Active	---	L.W. Hill, Jr. Homestead
Agricultural Easement	---	Active	---	Rollie Peterson Home
Agricultural Easement	---	Recently Sealed	1998	filled w/rocks in 1930's; N. of Wilkinson Lake outlet

The proposed development will include a total of 80 unsewered single family residential lots distributed among Development Sites B (Preserve East - 2 lots), C (Nord - 10 lots), F (Andersonville - 4 lots), and K (West Black Lake - 64 lots). Approximately 80 domestic wells will be installed in connection with this project to serve these lots. Individual sewage treatment systems will also be installed on an as-needed basis concurrent with development. All lots will be laid out to provide adequate separation between wells and individual sewage treatment systems, and all wells will be installed in accordance with state standards. The City of North Oaks annually sends water samples from 50 or more wells to the Ramsey County Health Department for analysis, and areas sampled are rotated each year.

- b. Will the project require an appropriation of ground or surface water (including dewatering)? ☒ Yes ☐ No
If yes, indicate the source, quantity, duration, purpose of the appropriation, and DNR water appropriation permit number of any existing appropriation. Discuss the impact of the appropriation on ground water levels.

Evaluation of the *Geologic Atlas of Ramsey County, Minnesota* (Minnesota Geological Survey, 1992) and USGS 10-foot-contour topographic mapping shows that ground water depths for the site vary from 0 to 50 feet below the surface. Water is at or near the surface much of the year in areas of wetlands, lakes, and shorelines. Most upland areas have watertable depths of 30 to 50 feet. Any areas with groundwater less than 10 feet below the surface will likely require dewatering prior to and during construction and/or utility installation. It is anticipated that a Minnesota DNR Water Appropriation Permit will be necessary to conduct construction dewatering and install sanitary sewer, municipal water, and storm sewer in some locations. The quantity and duration of dewatering necessary is not known at this time, but it is expected that the dewatering will be temporary. The scale of development underway at any one time will dictate whether construction

dewatering will exceed the 10,000 gallons/day or 1,000,000 gallons/year threshold that will trigger the requirement for a DNR Water Appropriation Permit. If it becomes apparent that construction dewatering will not exceed 50 million gallons in total and a duration of one year from the start of pumping, the project proposer will apply to the DNR for coverage under DNR General Permit 97-0005 for Temporary Water Appropriations. It is not anticipated that construction dewatering will be extensive or continue long enough to impact any domestic or municipal wells.

- c. Will the project require connection to a public water supply? ☒ Yes ☐ No

If yes, identify the supply, the DNR water application permit number of the supply, and the quantity to be used.

The City of North Oaks has planned for an adequate water supply to serve the proposed developments. Under proposed Joint Powers Agreements with the City of North Oaks, portions of the project will be connected to the City of Shoreview and the White Bear Township water supplies. No adverse effects on municipal water supplies are anticipated.

The municipal water demand per day will be typical of developments of this sort. It is expected that the quantity of water used will be proportional to the sanitary wastewater produced. Assuming consumption is approximately 110 percent of wastewater generation rate (see Item 19a), the estimated average water demand is 12,056 gallons per day for the area to be served by the City of Shoreview, and 170,489 gallons per day for the area to be served by White Bear Township.

Development Site A is proposed to be connected to the City of Shoreview public water supply. According to 1992 data provided by the Minnesota DNR, the City of Shoreview has six municipal wells that are authorized under DNR Water Appropriation Permit Number 74-5038. Some of these wells draw water from the Jordan aquifer. The City of Shoreview is permitted to pump 952 million gallons per year at a rate of 2,000 gallons per minute.

Development Sites B, C, D, E, and part of F are proposed to be connected to the White Bear Township water supply, which is approved under two DNR Water Appropriation Permits. Permit Number 84-6120 authorizes two wells that pump a combined volume of 65 million gallons at a rate of 750 gallons per minute. Permit Number 89-6037 authorizes one 26-million gallon well that pumps at a rate of 50 gallons per minute.

14. **Water-related Land Use Management Districts** Does any part of the project site involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? ☒ Yes ☐ No If yes, identify the district and discuss the compatibility of the project with the land use restrictions of the district.

Shorelands

The project includes Development Sites located partially or entirely within the Shoreland Overlay Districts of five lakes and one protected watercourse (Exhibit 7). These waters are listed in the following table. Three other protected waters in North Oaks (Pleasant Lake, Lake Gilfillan, and Teal Pond) have shoreland districts located entirely outside the project boundaries. The shoreland districts extend 1,000 feet from the OHW (Ordinary High Water Level) of each of the lakes and 300 feet from the edge of the bank of the channel of the protected watercourse that flows between Charley Lake and Long Lake. Water levels in the City of North Oaks are controlled by the St. Paul Water Utility, resulting in the absence of floodplains that otherwise might increase the landward extent of the shoreland district beyond 300 feet beyond the protected watercourse.

The proposed project is expected to comply with the density and impervious surface restrictions of City of North Oaks Ordinance No. 84, *An Ordinance for the Management of Shoreland Areas with the City of North Oaks* (March, 1995). However, certain variances to building height and setback requirements might be applied for as part of the shoreland PUD approval process for some Development Sites. Development Sites will be clustered in the least ecologically sensitive areas to avoid adverse effects on shorelands, water quality, and aquatic habitat. Although this clustered design may cause some

residential lots to not meet the minimum width dimensions, all development densities fall below the allowed density, and all Shoreland Districts will contain at least 50 percent open space.

Shoreland Districts Applicable to Portions of East Oaks Planned Unit Development					
Lake Name	DNR No.	OHW 1	Development Site Affected	Area Below the OHW in Project Area (acres)	Shoreland 2 Classification
Deep Lake	62-18P	None	C - Nord D - Rapp Farm	24.0	Recreational Development
Charley Lake	62-62P	None	A - Peterson Place	5.3	Recreational Development
Wilkinson Lake	62-43P	895.2	E - East Wilkinson F - Andersonville D - Rapp Farm	158.3	Natural Environment
Black Lake	62-19P	899.4	K - West Black Lake	25.5	Natural Environment
Mallard Pond	62-20P	None	I - West Deer Hills J - Ski Hill	18.2	Recreational Development
Charley-Long Lake Watercourse	N/A	edge of bank of channel	A - Peterson Place	N/A	Tributary

¹ OHWs were provide by the DNR Division of Waters, Metro Region.

² Shoreland Classifications were taken from City of North Oaks Ordinance No. 84, *An Ordinance for the Management of Shoreland Areas within the City of North Oaks* (March, 1995).

To define shoreland districts and evaluate project compatibility with shoreland regulations, the locations of the OHWs (Ordinary High Water Level; Edge of DNR jurisdiction) were estimated from two-foot contour topographic mapping and digital aerial photography. For lakes with assigned OHW elevations, the relevant contours and spot elevations were identified. For the remaining lakes, the edge of open water, or cattails if present, was identified from aerial photography. OHWs were digitized using the ArcView 3.0a Geographic Information System (GIS), and buffers were calculated to define the tiers of each shoreland district (Exhibit 7). Methods described in the Minnesota DNR *Cluster/PUD Evaluation Sheet*, definitions contained in Minnesota Rules Part 6120.2500 through 6120.3900 (*Management of Shorelands*) and the City of North Oaks Shoreland Ordinance were used to complete the shoreland analysis. The following table includes the applicable regulatory information used in this analysis.

Regulatory Shoreland Information Applicable to East Oaks Planned Unit Development					
Lake Name	Development Site Affected	Shoreland Classification	Sewered or Unsewered	Minimum Lot Size (sf) ¹	
				Riparian	Nonriparian
Deep Lake	C - Nord D - Rapp Farm	Recreational Development	Unsewered	40,000	40,000
Charley Lake	A - Peterson Place	Recreational Development	Sewered	20,000	15,000
Wilkinson Lake	E - East Wilkinson F - Andersonville D - Rapp Farm	Natural Environment	Sewered	single = 40,000 duplex = 70,000	single = 20,000 duplex = 35,000
Black Lake	K - West Black Lake	Natural Environment	Unsewered	80,000	80,000
Mallard Pond	I - West Deer Hills J - Ski Hill	Recreational Development	Sewered	20,000	15,000
Charley-Long Lake Watercourse	A - Peterson Place	Tributary	Sewered	single = 20,000 ² duplex = 35,000	single = 15,000 ² duplex = 26,000

¹ Development Site A could include single or duplex units, and Development Sites D and E could include single, duplex, or multi-family units. In these cases, the single unit lot size was used in the analysis to conservatively estimate the density allowed.

² The most closely related shoreland standard (Recreational Development; sewered) was used for the lot size for the Tributary shoreland because the North Oaks ordinance expresses the allowed density only by the minimum lot width for units with stream frontage and none of the proposed lots will have stream frontage.

The project area and project design do not include any bluffs, controlled lake access lots, or docks. Bluffs are defined as topographic features that drain toward the waterbody, rise at least 25 feet above the OHW, and have an average slope of at least 30 percent. Analysis of site topography (2-foot contour and 10-foot contour), and review of soil mapping (see Item 16) indicates that the project area does not include any slopes that exceed 25 percent.

The Wilkinson Lake Shoreland District includes a small portion of the 15-acre commercial development site proposed to be located in the southwest quadrant of Centerville Road and County Road J and included in Development Site E. The *DNR Cluster/PUD Evaluation Sheet* methods are not applicable to commercial development, and the commercial area in Development Site E was excluded from the shoreland analysis for Wilkinson Lake. Separate review of the proposed commercial development indicates it will comply with the Shoreland Ordinance. Commercial building floor space will not exceed 12 percent of the acreage (109,770 square feet), in compliance with floor-area ratio limits. Commercial buildings will not exceed 35 feet in height, and impervious surface coverage in the shoreland district is not expected to exceed 25 percent.

In applying the *DNR Cluster/PUD Evaluation Sheet* methods, lots with buildable areas located entirely outside the shoreland were excluded from the analysis. Lots with building pads located partially within a particular tier of the shoreland district were included in the respective analysis. All wetlands, including DNR Protected Waters, Wetlands, and Watercourses were excluded from the calculation of suitable area. For shoreland analysis purposes, only wetlands located above the OHWs are considered part of the open space.

As demonstrated in the following analyses, all proposed developments comply with the shoreland district density restrictions. In most cases, the proposed density is less than half the allowed density, even without consideration of density increase multipliers.

Charley Lake Shoreland Analysis

Development Site A will comply with the density restrictions of the Charley Lake Shoreland District. The proposed density represents 56 percent of the allowed density.

1	2	3	4	5	6	7	8	9
Tier	Total ¹ Area (acres)	Minus Wetlands (acres)	Suitable ¹ Area (acres)	Required Lot Size (sq. ft.)	Allowable Base Density	Density Proposed	Cumulative Density Allowed	Cumulative Density Proposed
1	4.7	2.6	2.1	20,000	4	0	4	0
2	5.8	3.2	2.6	15,000	7	3	11	3
3	6.7	2.7	4.0	15,000	11	9	22	12
4	5.8	1.7	4.1	15,000	12	7	34	19
Total	23.0	10.2	12.8		34	19	34	19

¹ The Total and Suitable Areas do not include any land within the Conservation Easement. Suitable Area does not include wetlands, bluffs, lake access lots, or any area below the OHW.

Charley-Long Lake Watercourse Shoreland Analysis

Development Site A will comply with the density restrictions of the Charley-Long Lake Watercourse Shoreland District. The proposed density is one unit less than the allowed density.

1	2	3	4	5	6	7	8	9
Tier	Total ¹ Area (acres)	Minus Wetlands (acres)	Suitable ¹ Area (acres)	Required ² Lot Size (sq. ft.)	Allowable Base Density	Density Proposed	Cumulative Density Allowed	Cumulative Density Proposed
1	5.8	3.8	2.0	15,000	6	5	6	5
Total	5.8	3.8	2		6	5	6	5

¹ The Total and Suitable Areas do not include any land within the Conservation Easement.

² 15,000 square feet was used as the required lot size because none of the proposed lots have riparian frontage on the DNR Protected Watercourse.

Deep Lake Shoreland Analysis

Development Sites C and D will comply with the density restrictions of the Deep Lake Shoreland District. The proposed density represents less than eight percent of the allowed density.

1	2	3	4	5	6	7	8	9
Tier	Total ¹ Area (acres)	Minus Wetlands (acres)	Suitable ¹ Area (acres)	Required Lot Size (sq. ft.)	Allowable ² Base Density	Density ³ Proposed	Cumulative Density Allowed	Cumulative Density Proposed
1	22.2	16.3	5.9	40,000	6	0	6	0
2	30.7	13.9	16.8	40,000	18	0	24	0
3	38.2	13.3	24.9	40,000	27	1	51	1
4	35.3	12.3	23.0	40,000	25	5	76	6
Total	126.4	55.8	70.6		76	6	76	6

¹ The Total and Suitable Areas include some land within the Conservation Easement. Suitable Area does not include wetlands, bluffs, lake access lots, or any area below the OHW.

² For analysis purposes, the allowed density was determined for unsewered developments. It should be noted that Site C will be unsewered, but Site D will be sewerred. Thus, this analysis is conservative.

³ Tier 3 = 1 unit in Site C. Tier 4 = 1 unit in Site C + 4 units in Site D.

Wilkinson Lake Shoreland Analysis

Development Sites D, E, and F will comply with the density restrictions of the Wilkinson Lake Shoreland District. The proposed density represents 38 percent of the allowed density.

1	2	3	4	5	6	7	8	9
Tier ¹	Total ² Area (acres)	Minus Wetlands (acres)	Suitable ² Area (acres)	Required Lot Size (sq. ft.)	Allowable ³ Base Density	Density ⁴ Proposed	Cumulative Density Allowed	Cumulative Density Proposed
1	77.3	30.9	46.4	40,000	50	42	50	42
2	80.7	28.3	52.4	20,000	114	50	164	92
3	87.3	17.5	69.8	20,000	152	27	316	119
Total	245.3	76.7	168.6		316	119	316	119

¹ Because the Tiers 1 through 3 are 320 feet wide, the 3rd and 4th Tiers were lumped to avoid analysis of a 40-foot wide Tier 4. Thus, the effective width of Tier 4 is 360 feet.

² The Total and Suitable Areas include some land within the Conservation Easement. Suitable Area does not include wetlands, bluffs, lake access lots, or any area below the OHW.

³ For analysis purposes, the allowed density was based on single family development, which requires more area per unit than multi-family development. Although the shoreland may include multi-family units, use of the allowed density for single family development makes this analysis conservative. The allowed density was based on sewerred developments, even though four units (in Site F) will be unsewerred. Application of the required lot size for unsewerred development to these four units would not change the results of this analysis.

⁴ Tier 1 = 40 units in Site E + 2 units in Site F. Tier 2 = 50 units in Site E. Tier 3 = 19 units in Site E + 2 units in Site F + 6 units in Site D. Six units in Site E, 6 in Site F, and most in Site D lie outside the shoreland.

Mallard Pond Shoreland Analysis

Development Sites I and J will comply with the density restrictions of the Mallard Pond Shoreland District. The proposed density represents 46 percent of the allowed density. A portion of Site I (West Deer Hills) falls within the Black Lake Shoreland Overlay District. However, Site I was only analyzed as part of the Mallard Pond Shoreland District. The overlapping shoreland districts are separated along the topographic drainage divide between Mallard Pond and Black Lake. All units in Site I are located within the Mallard Pond drainage area.

1	2	3	4	5	6	7	8	9
Tier 1	Total ² Area (acres)	Minus Wetlands (acres)	Suitable ² Area (acres)	Required Lot Size (sq. ft.)	Allowable Base Density	Density ³ Proposed	Cumulative Density Allowed	Cumulative Density Proposed
1	19.0	2.8	16.2	20,000	35	19	35	19
2	16.0	4.0	12.0	15,000	35	24	70	43
3	18.2	4.0	14.2	15,000	41	16	111	59
4	11.0	3.1	7.9	15,000	23	2	134	61
Total	64.2	13.9	50.3		134	61	134	61

- ¹ Tiers 1 through 3 are 267 feet wide. Thus, the effective width of Tier 4 is 199 feet.
² The Total and Suitable Areas do not include any land within the Conservation Easement. Suitable Area does not include wetlands, bluffs, lake access lots, or any area below the OHW.
³ Tier 1 = 19 units in Site I. Tier 2 = 21 units in Site I + 3 units in Site J. Tier 3 = 12 units in Site I + 4 units in Site J. Tier 4 = 2 units in Site I.

Black Lake Shoreland Analysis

Development Site K will comply with the density restrictions of the Black Lake Shoreland District. The proposed density represents 24 percent of the allowed density.

1	2	3	4	5	6	7	8	9
Tier 1	Total ² Area (acres)	Minus Wetlands (acres)	Suitable ² Area (acres)	Required ³ Lot Size (sq. ft.)	Allowable Base Density	Density Proposed	Cumulative Density Allowed	Cumulative Density Proposed
1	37.5	20.6	16.9	80,000	9	2	9	2
2	28.7	3.8	24.9	80,000	14	2	23	4
3	15.9	4.0	11.9	80,000	6	3	29	7
Total	82.1	28.427	53.7		29	7	29	7

- ¹ Tiers 1 and 2 are 400 feet wide. Thus, the effective width of Tier 3 is 200 feet.
² The Total and Suitable Areas include some land within the Conservation Easement. Suitable Area does not include wetlands, bluffs, lake access lots, or any area below the OHW.
³ The Black Lake Shoreland Analysis applies to Site K (West Black Lake), an unsewered single family Development Site with a minimum lot size of 80,000 square feet in all tiers.

Floodplains

The City of North Oaks does not currently participate in the National Flood Insurance Program (NFIP) and therefore is not covered by a Flood Insurance Rate Map (FIRM) from the Federal Emergency Management Agency (FEMA). A Flood Hazard Boundary Map was issued for the City of North Oaks in 1974 by the Department of Housing and Urban Development, Federal Insurance Administration (FIA). However, the FIA later concluded that, because the lakes in North Oaks are joined via aqueducts and the City of St. Paul Water Utility controls the outlet gates, a nearly constant water level is maintained on the lakes within North Oaks. This level of control eliminates the possibility that North Oaks would be inundated by a flood having a one-percent chance of annual occurrence. The FIA rescinded the Flood Hazard Boundary Map for the City of North Oaks and removed North Oaks from the list of flood prone

communities on March 21, 1975. In 1994, a flow control structure was constructed on the canal between Wilkinson Lake and Deep Lake. The St. Paul Water Utility controls the minimum and maximum water levels on Pleasant Lake.

15. **Water Surface Use** Will the project change the number or type of watercraft on any water body? ☐ Yes ☒ No
If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other users or fish and wildlife resources.

Motorized vehicles and fishing are prohibited on all lakes and ponds within the project area by the warranty deeds of North Oaks residents as well as by Minnesota Department of Natural Resources and St. Paul Water Utility regulations.

16. **Soils** Approximate depth (in feet) to:

Ground water: 0 to 50 feet *

Bedrock: 100 to 200 feet *

* Depths to ground water and bedrock were determined by comparing the water table contour (900) from *Geologic Atlas of Ramsey County, Minnesota* (Minnesota Geological Survey, 1992), to the USGS 10 foot contours, which range from 900 to 950 for the project area.

Describe the soils on the site, giving SCS classifications, if known (SCS interpretations and soil boring logs need not be attached).

The *Soil Survey of Washington and Ramsey Counties, Minnesota* (USDA, 1980) shows that the following soils are located on the property.

Symbol	Soil Classification	Hydric? ¹	Prime Farmland? ²
75	Bluffton loam	Yes	Yes ³
123	Dundas fine sandy loam	Yes	Yes ³
132B	Hayden fine sandy loam, 2 to 6 percent slopes	No	Yes
132C	Hayden fine sandy loam, 6 to 12 percent slopes	No	No
155C	Chetek sandy loam, 6 to 12 percent slopes	No	No
155D	Chetek sandy loam, 12 to 25 percent slopes	No	No
158B	Zimmerman loamy fine sand, 0 to 6 percent slopes	No	No
158C	Zimmerman loamy fine sand, 6 to 12 percent slopes	No	No
159B	Anoka loamy fine sand, 3 to 9 percent slopes	No	Yes
161	Isanti loamy fine sand	Yes	No
162	Lino loamy fine sand	No	No
169B	Braham loamy fine sand, 1 to 6 percent slopes	No	No
169C	Braham loamy fine sand, 6 to 15 percent slopes	No	No
170	Blomford loamy fine sand	Yes	No
177B	Gotham loamy sand, 1 to 6 percent slopes	No	No
177C	Gotham loamy sand, 6 to 12 percent slopes	No	No
225	Nessel fine sand loam, 1 to 4 percent slopes	No	Yes
265	Soderville loamy fine sand	No	No
453B	Demontreville loamy fine sand, 2 to 6 percent slopes	No	No
453C	Demontreville loamy fine sand, 6 to 12 percent slopes	No	No
453D	Demontreville loamy fine sand, 12 to 25 percent slopes	No	No
454B	Mahtomedi loamy sand, 0 to 6 percent slopes	No	No
454C	Mahtomedi loamy sand, 6 to 12 percent slopes	No	No
454D	Mahtomedi loamy sand, 12 to 25 percent slopes	No	No
481	Kratka fine sandy loam	Yes	Yes ³
540	Seelyeville muck	Yes	No
541	Rifle muck	Yes	No
543	Markey muck	Yes	No

Symbol	Soil Classification	Hydric? ¹	Prime Farmland? ²
544	Cathro muck	Yes	No
860C	Urban land-Hayden-Kingsley complex, 3 to 15% slopes	No	No
861C	Urban land-Kingsley complex 3 to 15% slopes	No	No
896C	Mahtomedi-Kingsley complex, 3 to 12% slopes	No	No
1027	Udorthents, wet substratum	No ⁴	No
1033	Udifuvents	No ⁵	No
1055	Aquolls and Histosols, ponded	Yes ⁶	No
1813B	Lino Variant loamy fine sand, 2 to 6 percent slopes	No	No

¹ Hydric soils are based on the list of *Hydric Soils of Minnesota* (1990).

² Prime Farmlands are based on the list of *Prime Farmlands of Minnesota*.

³ This mapping unit is only considered Prime Farmland when drained.

⁴ This mapping unit corresponds to areas of fill material at least two feet thick that has been placed on poorly drained mineral or organic soils. Most areas of this soil type have been developed. Some units may contain debris materials and should be investigated to determine site specific potentials and limitations.

⁵ This mapping unit corresponds to somewhat poorly drained soils often comprising shorelines along lakes and rivers. The seasonally high water table is within 4 feet of the surface and areas are used for beaches.

⁶ This mapping unit does not represent an actual soil series and therefore is not listed as Hydric in the list of *Hydric Soils of Minnesota*. However, it is a mapping unit that corresponds to soils that have naturally occurring high water tables.

Soils within the City of North Oaks vary significantly with some pockets of both heavy and light soils prevalent on individual lots. The character of the soils to the west of Pleasant Lake tends to be lighter. Previous development projects have encountered little problem in finding suitable soil conditions for building sites and individual sewage treatment systems.

17. **Erosion and Sedimentation** Give the acreage to be graded or excavated and the cubic yards of soil to be moved:

acres: Approximately 280 acres of the 1,666 acre site will be graded.

cubic yards: ± 840,000 cubic yards

Note: The anticipated cubic yards of grading is a preliminary estimate that is subject to change. This estimate is based on the assumption that 280 acres will be graded and 3,000 cubic yards of soil will be moved per acre graded. It will not be possible to more precisely estimate the number of cubic yards to be graded until Preliminary Grading Plans have been prepared for all Development Sites.

Describe any steep slopes or highly erodible soils and identify them on the site map. Describe the erosion and sedimentation measures to be used during and after construction of the project.

According to the *EAW Guidelines* (Minnesota Environmental Quality Board, 1990) slopes over 12 percent are subject to severe erosion. Based on analysis soils mapping (see Item 16), 2-foot contour and 10-foot contour topographic mapping of the site, the project area includes some areas with slopes of 12 to 25 percent, but does not include areas with slopes greater than 25 percent (see Exhibits 1 and 8). Most of the upland soils on the site are loamy fine sands and loamy sands that are considered highly erodible if they are exposed by practices that disturb the soil surface or remove vegetation for extended periods of time. Other soils on the site include sandy loams, fine sandy loams, loams and mucks which are less susceptible to erosion.

Development Sites A, B, C, D, and H include little or no steep slopes. Development Sites E, F, G, I, J, K, and L include steep slopes and some steep slopes will be graded in these areas. Where possible, proposed developments have been clustered in areas with few steep slopes and designed to avoid steep slope grading. Steep slope areas roughly correspond to the distribution of woodlands (Exhibit 4) and a substantial portion of the steep slopes within the project area occur within the 886 acres of Protected Land where little or no grading will occur (Exhibits 3 and 4). Custom grading of house and building pads in many of the Development Sites is expected to reduce the potential for erosion of steep slopes.

City of North Oaks Subdivision and Zoning Ordinances require that consideration be made at the time of subdivision to ensure that each lot has a suitable building site without materially changing existing contours. Additionally, the Protected Land will be covered by conservation and agricultural easements that prohibit building, vegetation alteration, surface grading, or any activity that would destroy, interfere with, or alter the general character of the described section of property (Appendix A).

Site grading will be done in phases to minimize the areas exposed to erosion at any one time. It is anticipated that all soils relocated during site grading will be used on-site in development of streets, building pads, and yards, and no soils will be transported off-site. All exposed soils will be seeded or stabilized within 72 hours after completion of final grading.

Because grading on most Development Sites will involve disturbance of more than five acres of land, they will need to be covered under the National Pollutant Discharge Elimination System (NPDES) General Permit for Construction Activities administered by the Minnesota Pollution Control Agency. This permit requires that best management practices (BMPs) be used to control erosion and that all erosion controls be inspected after each rainfall exceeding 0.1 inch of precipitation. All erosion control plans will be reviewed by the North Oaks City Engineer and the Vadnais Lake Area Water Management Organization. Erosion control will include practices such as:

1. Construction of temporary sediment basins in the locations proposed for stormwater ponds, and development of those basins for permanent use following construction.
2. Silt fence installed at the construction limits prior to the initiation of earth work and maintained until all exposed soil is stabilized.
3. Installation of rock construction entrances.
4. Energy dissipation, such as riprap, installed at storm sewer outfalls.
5. Cover crops seeded and landscaping planted to stabilize exposed surface soils after final grading.

Implementation of the above BMPs is expected to minimize the potential effects of construction-related sediment and erosion on water quality to the extent practicable. It is anticipated that erosion and sedimentation impacts will be limited primarily to short-term effects.

18. Water Quality - Surface Water Runoff

- a. Compare the quantity and quality of site runoff before and after the project. Describe methods to be used to manage and/or treat runoff.

No increase in the rate or decrease in the quality of site runoff is anticipated as a result of the proposed development. Runoff after construction is expected to be typical for residential and commercial development. Project development would increase impervious surface from about 12 to 99 acres, but would also include construction of approximately 24.6 acres of stormwater ponding to treat stormwater runoff to meet NURP (Nationwide Urban Runoff Program) guidelines and limit post-development runoff rates to current levels.

According to the *City of North Oaks 1998 Comprehensive Plan - Draft 4* (McCombs Frank Roos Associates, May 21, 1998), the city has minimal drainage problems, partially because lots are laid out and housing sites are located in a manner that respects natural drainage patterns. This development pattern is proposed for the East Oaks Planned Unit Development as well, and drainage is expected to be typical of previous development in the City of North Oaks.

Stormwater runoff from all parking and street surfaces will undergo pretreatment in sediment basins before discharging to wetlands. In accordance with VLAWMO (Vadnais Lake Area Water Management Organization), stormwater detention basins will be designed to limit peak discharge rates for 5- and 100-year storm events to pre-development conditions. Stormwater basins will be designed to meet NURP (Nationwide Urban Runoff Program) guidelines for removal of suspended sediment, phosphorus, and other nutrients from stormwater. NURP guidelines indicate that ponds designed in accordance with Walker (Walker, W.W. 1987. *Phosphorus Removal by Urban Runoff*

Detention Basins. Lake and Reservoir Management: Volume III. North American Lake Management Society) have:

1. A permanent pool (dead storage) volume greater than or equal to the runoff from a 2.5 inch storm over the entire contributing drainage area assuming full development.
2. A permanent pool average depth that is ≥ 4 feet, with a maximum depth of ≤ 10 feet.
3. An emergency spillway adequate to control the one percent frequency/critical duration rainfall event.
4. Basin side slopes no steeper than 3:1, with a 10:1 bench for the first one foot of depth below the normal water level.
5. Maximized distance between basin inlets and outlets.
6. A flood pool (live storage) volume adequate to limit discharges from 2-year and 100-year storms to or below predevelopment watershed conditions.

The proposed ponding, permeable soils, landscaping, and 886 acres of protected open space to be managed under conservation and agricultural easements are expected to ameliorate potential water quality impacts resulting from the increase in impervious surface coverage. Other measures that are expected to reduce potential effects on water quality include vegetated filter strips included throughout the project and skimmers incorporated into stormwater pond designs to prevent floatables and debris from entering receiving waters. Best management practices to be employed during construction are expected to reduce erosion and sediment loading of stormwater runoff (see Item 17).

- b. Identify the route(s) and receiving water bodies for runoff from the site. Estimate the impact of the runoff on the quality of the receiving waters. (If the runoff may affect a lake consult "EAW Guidelines" about whether a nutrient budget analysis is needed.)

After project construction is completed, stormwater from developed portions of the site will be routed through various detention ponds and municipal storm sewers before discharging to wetlands and ultimately to the local lakes. Because the proposed stormwater ponding will meet NURP guidelines and VLAWMO requirements and will be consistent with Metropolitan Council policies, only negligible post-development downstream water quality impacts are anticipated.

The St. Paul Water Utility has water rights on Wilkinson, Deep, Pleasant and Charley Lakes. Water from the Mississippi River is taken in at Fridley and pumped via two underground conduits into Charley Lake where it then flows by open canal to Pleasant Lake. From Pleasant Lake, water is pumped south through underground conduits to Sucker Creek and by open canals and lakes to the water treatment plant. Wilkinson Lake, as part of the St. Paul Water system, is connected to Deep Lake by open canal and serves as a reservoir for the system. The only drainage from North Oaks occurs via St. Paul Water Utility conduits from Pleasant Lake into Sucker Lake, and ultimately to Vadnais Lake in Vadnais Heights.

According to the wetland inventory prepared by the Ramsey Soil and Water Conservation District for Vadnais Lake Area Water Management Organization (VLAWMO) 1987 *Watershed Management Plan*, the City of North Oaks is divided into nine major watershed areas. Four of these watersheds are landlocked, representing roughly thirty percent of the area within the City. The remaining five watersheds drain to the major lakes in the city. The following nutrient budget analysis addresses the potential effects of development on lakes in North Oaks.

Nutrient Budget Analysis

The proposed development will likely cause an increase in the stormwater volume and associated sediments and nutrients entering area lakes. Three of these lakes, Deep, Charley, and Pleasant Lake, are considered "high value/high priority" lakes according to the *EAW Guidelines* (Environmental Quality Board, 1990) and activities that may affect these lakes require a nutrient

budget analysis. Mr. Dick Osgood of Ecosystem Strategies performed the nutrient budget analysis for this EAW.

Mr. Osgood applied a nutrient budget model and supporting data was provided by the St. Paul Water Utility. The nutrient budget analysis concluded that the impacts of the potential increase in stormwater on the three lakes will be minimal due to: (1) the use of NURP detention basins and (2) the increase in pollution is small compared to background levels. Sources of information used in the nutrient budget analysis include:

1. Osgood, R.A. 1984. *Lake mixis and internal phosphorus dynamics*. Arch. Hydrobiol. 113:629-635. – lake water quality model.
2. St. Paul Water Utility – watershed and lake models and coefficients, lake and runoff data.
3. Vadnais Lake Area Water Management Organization (VLAWMO) – lake and watershed data.
4. Metropolitan Council – lake data from 1985.

The North Oaks Company is proposing to develop portions of the remaining undeveloped areas in the City of North Oaks. A total of 780 acres will be developed into a maximum of 645 residential units and 21 acres of commercial development. The proposed developments will occur in 12 separate Development Sites. The existing land use in every case is undeveloped. These areas are summarized in the following table.

Development Site	Size (acres)	Residential Units	Commercial (acres)	Impervious Surface (acres)	Wetland (acres)
A	82	40	0	5.0	48
B	6	2	0	0.4	3
C	51	10	0	3.0	21
D	110	200	0	21.0	17
E	98	110	15	26.5	16
F	35	10	0	1.5	16
G	32	68	3	6.0	0
H	22	35	3	3.3	5
I	97	54	0	6.3	37
J	13	7	0	2.0	1
K	194	64	0	18.0	16
L	40	45	0	4.0	11
Total	780	645	21	97.0	191

Development Site A drains to Charley Lake, Site B and half of Site C drain to Pleasant Lake, and half of Site C and Sites D through L drain to Deep Lake. For purposes of this analysis, the development units were considered with respect to the lakes to which they drain, as shown in the following table.

Lake	Drainage Area (acres)	Residential Units	Commercial (acres)	Impervious Surface (acres)	Wetland (acres)
Deep	666	598	21	90.5	129.5
Charley	82	40	0	5.0	48.0
Pleasant	32	7	0	1.5	13.5
Total	780	645	21	97.0	191.0

Stormwater generated following the proposed development will be managed in conformance with VLAWMO requirements for new developments.

Drainage System

The three lakes evaluated here are part of a large surface water reservoir system used by the St. Paul Water Utility (SPWU). Water from the Mississippi River at Fridley is pumped through an underground pipe to Charley Lake. Charley Lake flows directly into Pleasant Lake, which flows into Sucker Lake and then into Vadnais Lake. Water from Vadnais Lake is pumped to the McCarrons municipal water treatment plant where water is then distributed throughout the SPWU system. Deep Lake also overflows into Pleasant Lake. Deep Lake receives surface drainage from Wilkinson Lake, which in turn receives drainage from Lake Amelia, Birch Lake, and Gilfillin Lake.

As a result of this complex drainage system, the lakes will be affected differently by the proposed development. The sources of water to the lakes are listed in the following table.

Deep Lake	Charley Lake	Pleasant Lake
Wilkinson Lake Overflow	Mississippi River	Deep Lake Overflow
Local Watershed	Local Watershed	Local Watershed
Direct Precipitation	Direct Precipitation	Direct Precipitation
		Charley Lake Overflow

The three lakes receive water from various sources, including overflow from adjacent waterbodies, runoff from the immediate drainage area, and precipitation directly on the lake surface. Each of these sources carries phosphorus. In addition, phosphorus is added to the lakes during the summer when lake sediments recycle deposited phosphorus – a process known as internal recycling. However, this process is controlled by the St. Paul Water Utility on Pleasant Lake. When the proposed development occurs, additional water and phosphorus from runoff will be added to the lakes' drainage areas and to the immediate watersheds. These additions will be reduced with the implementation of NURP basins in accordance with VLAWMO requirements.

The sources of water and phosphorus for Deep, Charley, and Pleasant Lakes have either been measured or can be estimated based on measurements of similar areas. The St. Paul Water Utility provided data and models used to estimate the water and phosphorus budgets described here. For this analysis, it is assumed that NURP basins will remove 50 percent of the phosphorus and zero percent of the water. With this information, the phosphorus concentration in each lake was estimated using the lake model from *Lake mixis and internal phosphorus dynamics* (Osgood, 1984).

Impacts of Proposed Development

The impacts of the proposed developments were evaluated in terms of increases in phosphorus runoff to the three lakes. Because phosphorus increases are correlated with increases in algae and reductions in recreational quality, it is typically evaluated. Further, excess phosphorus is known to be responsible for taste and odor problems in the water supply of the St. Paul Water Utility. Therefore, phosphorus increases, in comparison to background levels, were evaluated here as a means to assess the effects on the three lakes.

1. Deep Lake

Deep Lake receives water from three main sources, overflow from Wilkinson Lake, runoff from its immediate drainage area, and precipitation directly on the lake surface. Each of these sources carries phosphorus. When the proposed development occurs, additional water and phosphorus from runoff will be added to the Wilkinson Lake drainage and to the immediate watershed of Deep Lake.

The following tables summarize the expected effects of development on Deep Lake based on the total inputs of water and phosphorus.

Water to Deep Lake			
Source	Total Present	Added By Development (Without NURP Ponds)	Added By Development With NURP Ponding
Wilkinson Overflow	$100 \times 10^4 \text{ m}^3$	$25 \times 10^4 \text{ m}^3$	$25 \times 10^4 \text{ m}^3$
Direct Runoff	$12 \times 10^4 \text{ m}^3$	$1 \times 10^4 \text{ m}^3$	$1 \times 10^4 \text{ m}^3$
Direct Precipitation	$21 \times 10^4 \text{ m}^3$	$0 \times 10^4 \text{ m}^3$	$0 \times 10^4 \text{ m}^3$
Total	$133 \times 10^4 \text{ m}^3$	$26 \times 10^4 \text{ m}^3$	$26 \times 10^4 \text{ m}^3$

Phosphorus to Deep Lake			
Source	Present	Added By Development (Without NURP Ponds)	Added By Development With NURP Ponding
Wilkinson Overflow	200 kg	5 kg	5 kg
Direct Runoff	22 kg	4 kg	2 kg
Direct Precipitation	9 kg	0 kg	0 kg
Internal Recycling	531 kg	0 kg	0 kg
Total	762 kg	9 kg	7 kg

Phosphorus Concentration In Deep Lake		
Present	With Development (Without NURP Ponds)	With Development and NURP Ponding
126 ppb	122 ppb	122 ppb

Impacts to Deep Lake

According to the analysis above, an additional 7 kg (15 pounds) of phosphorus will be added to Deep Lake on an annual basis. This increase appears to lead to a reduction in the phosphorus concentration of Deep Lake. The large amount of additional water flowing to Deep Lake will offset the increased phosphorus. The model predicts a small decrease in lake phosphorus compared to the background concentration. It is a reasonable conclusion that neither phosphorus concentration nor the manifestations of phosphorus (algae and clarity) will be measurable or observable.

2. Charley Lake

Charley Lake receives water from three main sources, pumped flow from the Mississippi River, runoff from its immediate drainage area, and precipitation directly on the lake surface. Each of these sources carries phosphorus. When the proposed development occurs, additional water and phosphorus from runoff will be added to the immediate watershed of Charley Lake.

The following tables summarize the expected effects of development on Charley Lake based on the total inputs of water and phosphorus.

Water to Charley Lake			
Source	Present	Added By Development (Without NURP Ponds)	Added By Development With NURP Ponding
Mississippi River	$4,760 \times 10^4 \text{ m}^3$	$0 \times 10^4 \text{ m}^3$	$0 \times 10^4 \text{ m}^3$
Direct Runoff	$18 \times 10^4 \text{ m}^3$	$1 \times 10^4 \text{ m}^3$	$1 \times 10^4 \text{ m}^3$
Direct Precipitation	$9 \times 10^4 \text{ m}^3$	$0 \times 10^4 \text{ m}^3$	$0 \times 10^4 \text{ m}^3$
Total	$4,787 \times 10^4 \text{ m}^3$	$1 \times 10^4 \text{ m}^3$	$1 \times 10^4 \text{ m}^3$

Phosphorus to Charley Lake			
Source	Present	Added By Development (Without NURP Ponds)	Added By Development With NURP Ponding
Mississippi River	2,761 kg	0 kg	0 kg
Direct Runoff	46 kg	9 kg	4 kg
Direct Precipitation	4 kg	0 kg	0 kg
Internal Recycling	137 kg	0 kg	0 kg
Total	2,948 kg	9 kg	4 kg

Phosphorus Concentration In Charley Lake		
Present	With Development (Without NURP Ponds)	With Development and NURP Ponding
59 ppb	9 ppb	59 ppb

Impacts to Charley Lake

According to the analysis above, an additional 4 kg (9 pounds) of phosphorus will be added to Charley Lake on an annual basis. This increase will have no impact to the phosphorus content of Charley Lake. The huge amount of water and phosphorus from the Mississippi River overwhelms Charley Lake, so the addition of 4 kg, or about 0.1 percent, is insignificant. It is a reasonable conclusion that neither phosphorus concentration nor the manifestations of phosphorus (algae and clarity) will be measurable or observable.

3. Pleasant Lake

Pleasant Lake receives water from four main sources, overflow from Charley and Deep Lakes, runoff from its immediate drainage area, and precipitation directly on the lake surface. Each of these sources carries phosphorus. When the proposed development occurs, additional water and phosphorus from runoff will be added to the immediate watershed of Pleasant Lake as well as through the overflows of Deep and Charley Lakes.

The following tables summarize the expected effects of development on Pleasant Lake based on the total inputs of water and phosphorus.

Water to Pleasant Lake			
Source	Present	Added By Development (Without NURP Ponds)	Added By Development With NURP Ponding
Charley Lake	$4,760 \times 10^4 \text{ m}^3$	$3 \times 10^4 \text{ m}^3$	$3 \times 10^4 \text{ m}^3$
Deep Lake	$133 \times 10^4 \text{ m}^3$	$61 \times 10^4 \text{ m}^3$	$61 \times 10^4 \text{ m}^3$
Direct Runoff	$51 \times 10^4 \text{ m}^3$	$1 \times 10^4 \text{ m}^3$	$1 \times 10^4 \text{ m}^3$
Direct Precipitation	$176 \times 10^4 \text{ m}^3$	$0 \times 10^4 \text{ m}^3$	$0 \times 10^4 \text{ m}^3$
Total	$5,147 \times 10^4 \text{ m}^3$	$65 \times 10^4 \text{ m}^3$	$65 \times 10^4 \text{ m}^3$

Phosphorus to Pleasant Lake			
Source	Present	Added By Development (Without NURP Ponds)	Added By Development With NURP Ponding
Charley Lake	2,820 kg	0 kg	0 kg
Deep Lake	168 kg	0 kg	0 kg
Direct Runoff	16 kg	6 kg	3 kg
Direct Precipitation	76 kg	0 kg	0 kg
Internal Recycling	226 kg	0 kg	0 kg
Total	3,306 kg	6 kg	3 kg

Phosphorus Concentration in Pleasant Lake		
Present	With Development (Without NURP Ponds)	With Development and NURP Ponding
36 ppb	36 ppb	36 ppb

Impacts to Pleasant Lake

According to the analysis above, an additional 3 kg (7 pounds) of phosphorus will be added to Pleasant Lake on an annual basis. This increase will have no impact to the phosphorus content of Pleasant Lake. The huge amount of water and phosphorus from the Charley Lake overflow overwhelms Pleasant Lake, so the addition of 3 kg, or about 0.1 percent, is insignificant. It is a reasonable conclusion that neither phosphorus concentration nor the manifestations of phosphorus (algae and clarity) will be measurable or observable.

Overall Conclusion

No significant impacts to Deep, Charley or Pleasant Lakes will occur as a result of the proposed developments.

19. Water Quality - Wastewaters

- a. Describe sources, quantities, and composition (except for normal domestic sewage) of all sanitary and industrial wastewaters produced or treated at the site.

Only normal domestic sewage wastewater production is expected, and industrial wastewater generation is not anticipated.

- b. Describe any waste treatment methods to be used and give estimates of composition after treatment, or if the project involves on-site sewage systems, discuss the suitability of the site conditions for such systems. Identify receiving waters (including ground water) and estimate the impact of the discharge on the quality of the receiving waters. *(If the discharge may affect a lake consult "EAW Guidelines" about whether a nutrient budget analysis is needed.)*

Development Sites B (2 lots), C (10 lots) part of F (4 lots), and K (64 lots) will be served by Individual Sewage Treatment Systems (ISTS). Thus, out of a total of 645 residential units proposed, 80 (13.4 percent) will be served by on-site septic systems. The majority of wastewater is proposed to be discharged to sanitary sewer systems of the City of Shoreview and White Bear Township.

There has been little problem to date in finding suitable soil conditions on each lot for building sites and individual sewage treatment systems. According to the *City of North Oaks 1998 Comprehensive Plan - Draft 4* (McCombs Frank Roos Associates, May 21, 1998), limitations for individual sewage treatment systems in the unsewered portions of the project range from none to severe. Many of the proposed lots fall in areas that have moderate to no limitations.

Individual sewage treatment systems will be located, designed, and installed in accordance with city ordinances and Minnesota Rules Chapter 7080, *Individual Sewage Systems Treatment Standards*. Soil percolation rates will be determined by on-site testing on a lot-by-lot basis, and lot boundaries will be adjusted where necessary to ensure that each lot will have two 5,000-square-foot sites for on-site sewage treatment systems as required by City ordinance. If percolation rates are determined to be faster than one-tenth minute per inch, an alternative absorption field location will be identified, or, as stated in Chapter 7080 (Part 7080.0210, Appendix A, Subp. 3), "six inches of sandy loam textured soil having a percolation rate between five and 15 minutes per inch shall be placed between the filter material and the coarse soil." Similarly, all systems will provide "three feet of separation between the bottom of the soil treatment area and the highest known or calculated level of the water table." Mound systems will be utilized only if no other viable alternative exists.

Building permits will not be issued until individual sewage treatment system plans are approved. City Ordinances incorporate the latest Minnesota Pollution Control Agency standards, which detail procedures for:

1. site evaluation,
2. abatement of polluting systems,
3. maintenance,
4. inspection of all new, altered, extended and repaired systems,
5. biennial inspection and pumping of all systems,
6. permits,
7. reports and licensing, and
8. the appointment of a sanitary inspector.

The nutrient budget analysis specified in the *EAW Guidelines* (Minnesota Environmental Quality Board, 1990) is included under Item 18b. Individual sewage treatment systems will comply with all applicable rules and setbacks, and drainage from these systems will filter through the soils before reaching groundwater, wetlands, and lakes. Because individual sewage treatment systems will adhere to these standards and rules for septic system design, construction, and inspection, significant negative impacts to surface or ground water are not anticipated.

- c. If wastes will be discharged into a sewer system or pretreatment system, identify the system and discuss the ability of the system to accept the volume and composition of the wastes. Identify any improvements which will be necessary.

Wastewater from some Development Sites is proposed to be conveyed through the White Bear Township and City of Shoreview sanitary sewer systems. The proposed project would be adding approximately 279 acres of service area to the Centerville Road Trunk Sewer, 150 acres to the Forest Lake Interceptor, and 82 acres to the Shoreview Interceptor. The City of North Oaks will enter into proposed Joint Powers Agreements with White Bear Township and the City of Shoreview to arrange for sewer and water service for these areas. Development Sites D, E, part of F, G, H, I, J, and L would be served by the White Bear Township sewer system, and Development Site A would be served by the City of Shoreview sewer system.

Sanitary wastewater production was estimated using the methods outlined in the *Service Availability Charge (SAC) Procedures Manual* (Metropolitan Council Environmental Services, 1996). One SAC unit equals 274 gallons of maximum potential daily wastewater flow volume. Wastewater volume was estimated by assigning one SAC unit per residential unit or per 2,700 square feet of commercial space. Based on these figures, the estimated wastewater production is 154,990 gallons per day in the area to be served by White Bear Township, and 10,960 gallons per day in the area to be served by the City of Shoreview, as shown in the following tables.

Sanitary Wastewater Production to be Discharged to the White Bear Township Sewer System					
Proposed Use	SAC Rate	Units	SAC Units	Gallons/Day SAC Unit	Wastewater (gallons/day)
Residential	1/Unit	525	525	274	143,850
Commercial	1/2,700 s.f. ¹	109,770 s.f.	40.68	274	11,140
				Total	154,990

¹ The SAC rate of 1 SAC unit per 2,700 is based on the assumption that the Commercial Development area will be approximately half retail (1/3,000 s.f.) and half office (1/2,400 s.f.).

Sanitary Wastewater Production to be Discharged to the City of Shoreview Sewer System					
Proposed Use	SAC Rate	Units	SAC Units	Gallons/Day SAC Unit	Wastewater (gallons/day)
Residential	1/Unit	40	40	274	10,960
Commercial	1/2,700 s.f.	0	0	274	0

Total	10,960
-------	--------

The total projected flow rate does not exceed the allocated design capacities of existing trunk sewer and wastewater treatment facilities. At the time when trunk sewers were designed, the City of North Oaks was assigned a specific capacity in each of the interceptors. The City is currently utilizing less than eight percent of its potential available capacity in the existing interceptor sewers. The potential capacity available to North Oaks is 1.00 MGD, and the current flow is only 0.074 MGD. Based on the estimates given above, municipal wastewater generation per day after project construction is expected to total 165,950 gallons per day. White Bear Township has constructed a sanitary trunk line along Centerville Road. This trunk sewer facility connects to the Forest Lake Interceptor and has a reserved capacity of 0.17 MGD for the east and northeast undeveloped areas of North Oaks. The estimates above indicate the project is expected to use about 0.155 MGD of the reserved capacity. Wastewater will be conveyed through the Forest Lake and Shoreview interceptors to the Pigs Eye Wastewater Treatment Plant (PEWWTP). The sanitary sewer system has sufficient capacity to handle the additional wastewater generation, and the treatment capacity of the PEWWTP is sufficient to handle the anticipated increase.

20. Ground Water - Potential for Contamination

- a. Approximate depth (in feet) to ground water: See Item 16
- b. Describe any of the following site hazards to ground water and also identify them on the site map: sinkholes; shallow limestone formations/karst conditions; soils with high infiltration rates; abandoned or unused wells. Describe measures to avoid or minimize environmental problems due to any of these hazards.

According to the *Geologic Atlas of Ramsey County, Minnesota* (Minnesota Geological Survey, 1992), "geologic sensitivity is the degree of protection provided by geologic materials overlying an aquifer...based on the vertical travel time which reflects the ability of geologic materials to impede the vertical movement of contamination...controlled by the permeability, thickness, and lithology of the geologic material." The *Sensitivity of the Water-Table System to Pollution* Plate of the Atlas shows the majority of the project area as moderately sensitive with estimated travel times for water-borne contaminants at the land surface to reach the water-table system being years to decades. Areas encircling lakes and other depressional areas have high to very high sensitivity ratings which corresponds to travel times of weeks to years or hours to months, respectively. According to the *Sensitivity of the Prairie Du Chien-Jordan Aquifer to Pollution* Plate of the Atlas, the sensitivity rating for this aquifer in the area of the project is generally low to moderate with travel times of decades to a century or years to decades, respectively. Areas of higher sensitivity correspond to units of St. Peter Sandstone bedrock.

The project area includes 11 known wells, which have been located by Kurth Surveying, Inc. and are described in the table included under Items 9 and 13a. Six of the known wells have been sealed and abandoned and five wells are currently active. The five active wells are operated in support of activities located at the Hill Residence and Farmstead, located within the Allowable Building Area covered under the proposed Agricultural Easement (Exhibit 4). These wells will remain active and continue to be used for domestic water. Any additional domestic wells identified in the Development Sites will be sealed and abandoned in compliance with Minnesota Department of Health regulations.

The project design is expected to have minimal potential for groundwater contamination. Development Sites will be clustered on uplands in the least sensitive areas available, and physical effects on wetlands will be limited to 0.35 acres of fill necessary for road crossings. Consequently, the project is not expected to have significant effects on the groundwater system.

- c. Identify any toxic or hazardous materials to be used or present on the project site and identify measures to be used to prevent them from contaminating ground water.

No toxic or hazardous materials other than vehicle fuels, household cleaners, and lawn care pesticides are expected to be used on the project site after development.

21. Solid Wastes; Hazardous Wastes; Storage Tanks

- a. Describe the types, amounts, and compositions of solid or hazardous wastes to be generated, including animal manures, sludges and ashes. Identify the method and location of disposal. For projects generating municipal solid waste indicate if there will be a source separation plan; list type(s) and how the project will be modified to allow recycling.

It is anticipated that solid waste generation will be typical of developments of this sort. Based on the solid waste generation study known as the *AB 939 Plan Commercial Generator Strategies* (City of Los Angeles, 1990), the maximum potential solid waste generation for the development is estimated at 1,409 tons per year. This estimate is based on the following table. No animal manure, sludge, or ash generation is anticipated.

Use	Unit of Measure	Correlative Factor (tons/unit)	Number of Units of Measure	Waste Generation Estimate (tons/year)
Single Family Residential	Unit	1.79 ¹	645	1,155
Commercial/Retail	Employee	1.27 ²	200 ³	254
			Total	1,409

¹ The Residential Development Sites are expected to be a combination of Single and Multi-Family Residential. The applicable Correlative Factors are 0.97 tons/unit for Multi-Family Residential and 1.79 tons/unit for Single-Family Residential. The Correlative Factor for Single-Family Residential was used to conservatively estimate the effects of solid waste generation.

² The Commercial Development area is expected to be a combination of Retail and Office. The applicable Correlative Factors are 0.18 tons/unit for Office and 1.27 tons/unit for Retail. The Correlative Factor for Retail was used to conservatively estimate the effects of solid waste generation.

³ The number of employees for 109,770 square feet of Commercial/Retail area was based on a ratio of 1.82 employees per 1,000 square feet, which was provided for Specialty Retail Centers in *Trip Generation*, 5th Edition (Institute of Transportation Engineers, 1991).

Types of solid waste generation expected and the relative percentage of each type (by weight) are estimated in the following table.

Waste Type	Percentage	
	Residential	Commercial
Paper	31	28
Other Organics ¹	22	36
Yard Wastes	19	7
Other Waste ²	10	11
Plastics	7	5
Metals	5	6
Glass	5	1
Special Wastes ³	1	6
Total	100	100

¹ Other Organics include such items as food wastes, textiles/clothes, wood, and rubber products.

² Other Wastes include items such as inert solids and household hazardous wastes.

³ Special Wastes include items such as ash, asbestos, and oversized bulky wastes.

Future residents of the proposed development will contract with private hauler(s) for the removal of solid wastes, and the hauler(s) will deposit the solid waste at an approved landfill. City Zoning Ordinances provide standards for refuse storage and regulate smoke, dust, odors and noise. The City of North Oaks contracts with a private hauler and operates a drop-off recycling center to provide monthly recycling services for all residents. Active recycling will be expected to reduce costs for solid waste trucking and disposal.

- a. Indicate the number, location, size, and use of any above or below ground tanks to be used for storage of petroleum products or other materials (except water).

Records obtained by B.A. Liesch Associates during the execution of a Phase I Environmental Site Assessment for the property indicate the project area includes or formerly included nine above ground or underground storage tanks. These tanks are listed in the following table.

Three of these tanks are included in the Minnesota Pollution Control Agency's (MPCA's) Leaking Underground Storage Tank (LUST) site list. Tank Number 002 was located at the Old Farmstead within Development Site I (Exhibit 4) and corresponds to LUST site 3384. The tank was removed in 1990, and a report on the contamination has been submitted to the MPCA. LUST site 3384 will continue to be coordinated with the MPCA, and remediated if necessary, until the MPCA closes this file and determines that the contamination has been adequately addressed. Tank Number 004 was located at the Hill Residence and corresponds to LUST site 3962. The tank was removed in 1991, and the MPCA has closed this file, indicating that contamination associated with the leak has been adequately addressed. Tank Number EEE is located at the Hill Residence and corresponds to LUST site 9928. The tank has been abandoned and filled with soil, and the MPCA has closed this file, indicating that the contamination has been adequately addressed.

The tanks that remain active are located within the allowable building area of the Agricultural Easement and will not be affected by the proposed development. It is not anticipated that the proposed developments will involve the installation of additional above or underground storage tanks.

Registered Above Ground and Underground Storage Tanks located within the East Oaks PUD						
Tank Number	Above or Underground	Date Installed	Location ¹	Status	Substance Stored	Capacity
002	Underground	Unknown	Old Farmstead	Removed 10/12/90	Fuel Oil	1,000
003	Underground	01/09/91	Hill Farmstead	Active	Unknown	3,000
004	Underground	Unknown	Hill Residence	Removed 04/29/91	Gasoline	1,000
005	Underground	09/01/80	Hill Residence	Active	Fuel Oil	4,000
01A	Underground	Unknown	Hill Farmstead	Removed 10/12/90	Gasoline	2,000
1001	Above Ground	Unknown	Hill Farmstead	Active	Waste Oil	265
CCC	Underground	09/01/80	Hill Farmstead	Active	Diesel Fuel	1,000
EEE	Underground	Unknown	Hill Residence	Abandoned/Filled	Fuel Oil	1,000
FFF	Underground	Unknown	Hill Farmstead	Active	Diesel Fuel	500

¹ See Exhibit 4 for the location of the Old Farmstead, Hill Farmstead, and Hill Residence.

22. Traffic

Parking spaces added: 660 (In commercial Development Sites)

Existing spaces (if project involves expansion): 0

Estimated total Average Daily Traffic (ADT) generated: 10,884 trips/day

Estimated maximum peak hour traffic generated (if known) and its timing: 1,062; 4:30-5:30 PM

For each affected road indicate the ADT and the directional distribution of traffic with and without the project. Provide an estimate of the impact on traffic congestion on the affected roads and describe any traffic improvements which will be necessary.

The proposed project is consistent with the land use assumptions used in previous City of North Oaks and Regional Transportation Planning studies. The project will generate approximately 10,884 trips per day, and this traffic will be distributed to the surrounding roadway network. Due to the consistency of the project with previous studies, the project is not expected to have significant adverse effects on the regional roadway system.

The City of North Oaks is bounded on all sides by State and County State Aid Highways (CSAHs). On the southern boundary is State Highway 96, a two lane facility with the functional classification as a minor arterial roadway. Highway 96, which is currently being improved to a four-lane highway from State Highway 61 to Old Highway 8, runs east-west, providing direct access to Interstate Highways 35W and 35E. The intersection of County Highway 96 and Pleasant Lake Road is the main access to the City of North Oaks. It is a signalized intersection with auxiliary turn lanes. The western boundary of the City is formed by State Highway 49 (Hodgson Road), a two-lane facility also classified as a minor arterial roadway. Highway 49 runs north-south, providing direct access to Interstate Highway 694. The intersection of Highways 49 and 96 is an at-grade signalized intersection. On the eastern boundary is Centerville Road (CSAH 59), which is classified as a minor arterial reliever road. Along the north boundary are County Road J (Ash Street), a minor arterial expander road, and CSAH 4 (Turtle Lake Road/Sherwood Road). These roadways are classified as collector roads. The intersection of Centerville Road and Highway 96 is a signalized intersection. No metropolitan highway systems are located within North Oaks.

Daily and peak hour trip generation for the site was calculated using the 6th Edition of *Trip Generation* (Institute of Transportation Engineers, 1997). As shown in the following table, total daily trip generation after full development is estimated at 10,884. PM peak hour trip generation is estimated at 1,062.

Trip Generation for the East Oaks Planned Unit Development						
Use	Unit	Number of Units	Daily Trips/Unit	PM Peak Hour Trips/Unit	Daily Trip Generation	PM Peak Hour Trip Generation
Residential ¹	Dwelling	645	9.57	1.01	6,173	651
Commercial / ² Retail	1,000 sf	109.77	42.92	3.74	4,711	411
Total					10,884	1,062

¹ The Residential use is likely to include a mix of Single-family and Multi-family. The respective daily trip generation rates for these uses (per unit) are 9.57 and 5.86. The generation rate for Single-family residential was used to estimate the maximum potential traffic impact of the development.

² The Shopping Center trip generation rate was used for Commercial Development to estimate the most likely (mid-range) scenario. The Commercial Development area could include office, retail, and/or restaurant use. The respective daily trip generation rates for these uses (per 1,000 sf) are 11.01, 42.92, and 130.34.

The majority of the generated traffic is expected to head east, west, and south to access Highway 96, Highway 49, and I-35E. Based on assumptions and quickest routes to high-volume roadways, the future trip assignment volumes were computed for roadways in the project area. The results of the trip distribution assignment are included in the following table.

The estimated trip generation and distribution for the project shows traffic volume growth that exceeds the forecasted future traffic volume for certain roadways. This discrepancy can be explained by two factors. One, the anticipated timeline for full project development is expected to be 20 to 30 years. Full development would therefore occur 2 to 12 years after the date used for the forecast of future traffic volumes. Two, the nature of area-wide traffic projections is such that a detailed study of a smaller area will often yield higher volumes than shown in the respective area-wide study. In most cases where the projected volumes with development exceed the previous forecasts for the year 2017, the differences are relatively small and do not affect the assessment of the roadway's ability to meet traffic demands. Considering the consistency of the project with land uses assumed in previous traffic studies and the

extended project development timeline, it is expected that local road authorities will have adequate time to plan and program any necessary road upgrades. Consequently, the project is not expected to have significant adverse effects on the regional transportation system.

Effect of East Oaks Planned Unit Development Trip Generation on Local Collector and Expander Roadways						
Roadway	Classification	Segment	Existing ¹ ADT (1997)	East Oaks Daily Trip Generation	Forecast ¹ Future ADT (2017)	ADT with ² Project Increase (+2028)
Turtle Lake Road (CSAH 4)	Collector	Adjoining North Oaks	1,950	668	2,535	2,618
Sherwood Road (CSAH 4)	Collector	Adjoining North Oaks	550	362	715	912
Hodgson Road (Hwy. 49)	Minor Arterial	CSAH 4 to Tanglewood Drive	13,800	668	17,490	14,468
County Road J (Ash Street)	Minor Arterial Expander	Adjoining North Oaks	3,400	1,667	4,420	5,067
Centerville Road (CSAH 59)	Minor Arterial Reliever	County Line to CSAH H2	4,300	4,514	5,590	8,814
Centerville Road (CSAH 59)	Minor Arterial Reliever	CSAH H2 to Birch Lake Blvd.	5,950	3,695	7,735	9,645
Centerville Road (CSAH 59)	Minor Arterial Reliever	Birch Lake Blvd. to Hwy. 96	9,550	5,092	12,710	14,642
Birch Lake Blvd.	Minor Collector	North Oaks Road to Centerville Road	1,453 ³	1,397	2,634	2,840
East Pleasant Lake Road	Minor Collector	East Oaks Road to Hwy. 96	4,884 ⁴	220	5,959	5,104
Hwy. 96	Minor Arterial	at Centerville Road	16,700	5,092	21,710	21,792

¹ Existing and Future ADTs were taken from ADTs provided in the *City of North Oaks 1998 Comprehensive Plan, Draft 4* (McCombs Frank Roos Associates, May 21, 1998), which were derived from Ramsey County traffic data.

² The Project Increase does not include background growth of the existing ADT.

³ The existing and future ADTs for Birch Lake Boulevard were adjusted from the 1991 ADT provided in the *North Oaks Comprehensive Plan* by applying an annual background traffic growth rate of 3 percent.

⁴ The existing and future ADTs for East Pleasant Lake Road were adjusted from the 1991 ADT provided in the *North Oaks Comprehensive Plan* by applying an annual background traffic growth rate of 1 percent, considered appropriate in this case because most land that could distribute traffic to this roadway is already developed.

In 1976, and again in 1980, the city retained a consultant to analyze traffic patterns and present solutions to some problem areas within the city. As a result of implementing the consultant's recommendations, traffic flow has been more evenly distributed on the minor collector roads. The entire city is part of Traffic Assignment Zone (TAZ) 999, and all traffic is assigned to TAZ 999. Because of the limited number of accesses to the road system, traffic volume data at the accesses is more accurate than analysis by TAZ.

The City of North Oaks participated in a joint transportation planning effort affecting that portion of I-35E from I-35E north of I-694 to County Road J at the northern boundary of Ramsey County. The study area included approximately two miles on either side of I-35E. The study's findings and recommendations were incorporated into the Metropolitan Council's Transportation Policy Plan. The city-by-city land use scenario of probable development (which generally incorporated North Oaks land uses from the 1994 Comprehensive Plan) was used to calculate trip generation and impacts to the I-35E roadway system. It was determined that the probable level of development could be accommodated with varying levels of improvements to I-35E and the local street systems.

For the City of North Oaks, the probable land use scenario assumed the addition of 850 single-family dwelling units, 140 multi-family dwelling units and 240,000 square feet of retail development. The proposed project will entail a less aggressive development scenario, with 645 residential units and 109,770 square feet of commercial development. These numbers are significantly less than were accounted for in the I-35E corridor study and do not exceed the "probable development" scenario.

The proposed project is consistent with the land uses and traffic volumes considered as part of previous studies and the project development process for the proposed upgrades to surrounding roadways. Based on this consistency and the scheduled upgrades, the project is not expected to have significant adverse effects on the regional transportation system.

23. **Vehicle-related air emissions** Provide an estimate of the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts. *(If the project involves 500 or more parking spaces, consult "EAW Guidelines" about whether a detailed air quality analysis is needed.)*

The increased traffic will generate a corresponding increase in carbon monoxide levels and other vehicles-related air emissions. As noted under Item 22, development in the project area is not expected to have a significant negative impact on regional traffic operations and therefore is expected to have a negligible impact on air quality. No baseline air quality monitoring or predictive air quality modeling has been scheduled at this time, and no measures to mitigate air quality impacts have been considered. Because only about 660 parking stalls will be necessary to serve the 109,770 square feet of commercial development proposed, the project will not require an Indirect Source Permit for air emissions.

24. **Stationary source air emissions** Will the project involve any stationary sources of air emissions (such as boilers or exhaust stacks)? ☐ Yes ☒ No

If yes, describe the sources, quantities, and composition of the emissions; the proposed air pollution control devices; the quantities and composition of the emissions after treatment; and the effects on air quality.

No stationary source air emissions are anticipated as a result of this project.

25. **Will the project generate dust, odors, or noise during construction and/or operation?** ☒ Yes ☐ No
If yes, describe the sources, characteristics, duration, and quantities or intensity, and any proposed measures to mitigate adverse impacts. Also identify the location of sensitive receptors in the vicinity and estimate the impacts on these receptors.

It is anticipated that noise levels will increase locally during construction of new roadways, residential lots, building pads, and ponds. The actual noise levels on and adjacent to the site will vary considerably depending on the number of pieces of equipment being operated simultaneously, the percent of time in operation, and the distance from the equipment to the noise receptors. Although a number of machines could be operating simultaneously, it is anticipated that most construction activities will be confined to the hours between 7:00 am and 7:00 pm. After development, it is anticipated that the principal source of noise will be additional traffic along roadways surrounding the development. No noise mitigation measures have been proposed.

Typical Construction Equipment Noise Levels					
Machine Type	Manufacturer	Model	Noise Level (dBA) at 200'	Noise Level (dBA) at 400'	Noise Level (dBA) at 800'
Backhoe ¹	Link Belt	4000	80	74	68
Backhoe ¹	John Deere	609A	73	67	61
Front Loader ¹	Caterpillar	980	72	66	60
Front Loader ¹	Caterpillar	966	69	63	57
Scraper ¹	Caterpillar	660	80	74	68
Scraper ¹	Caterpillar	641B	73	67	61
Truck ²	Unspecified	Unknown	79	73	67

¹ Data originated from a Federal Highway Administration study published in 1973.

² Data originated from the *Traffic Noise and Vibration Manual*, Illinois Department of Transportation, 1977.

The construction process is also expected to generate some dust. Because most of the site is situated some distance from existing residential homes, it is not anticipated that fugitive dust will be generated in objectionable quantities. Consideration will be given to suppression of airborne dust by application

of water if significant fugitive dust generation occurs during site grading. It is not anticipated that construction or use of the site after development will generate significant odors.

26. Are any of the following resources on or in proximity to the site:

- a. archeological, historical, or architectural resources? ☐ Yes ☒ No

A cultural review was requested from the State Historic Preservation Office (SHPO) in advance of EAW publication to expedite the review process. The East Oaks PUD project area was assigned SHPO Number 98-1074. The SHPO recommended that a survey of the area be completed. A Phase I Cultural Resource Reconnaissance Survey was conducted to the level of Section 106 of the National Historic Preservation Act in May of 1998 by Loucks and Associates. No significant properties were found and copies of the report were forwarded to SHPO and Mr. Mark Dudzik at the Office of the State Archaeologist. No further work was recommended by Loucks and Associates. The SHPO indicated in a letter dated July 17, 1998 that the probability for significant properties to be located in the area of potential effect is low. Correspondence from SHPO is included in Appendix F.

- b. prime or unique farmlands? ☒ Yes ☐ No

The project area contains about 100 to 120 acres of prime farmland of which approximately 60 to 85 acres will be converted to residential and commercial uses. Because the site is guided for residential and commercial use, no clear alternatives to conversion of prime farmland are readily identifiable.

According to the list of *Prime Farmlands of Minnesota* (U.S. Natural Resources Conservation Service, formerly the Soil Conservation Service), the site contains six soil classifications that are considered prime farmlands (see Item 16). Three of these six soils are only considered prime when drained and are also identified as hydric soil units. The project area includes a total of about 100 to 120 acres of prime farmland, of which approximately 30 to 40 acres are considered prime farmland when drained. The prime farmland is concentrated in the northwest portion of the site (northwest of Wilkinson Lake), with additional pockets along the east-central boundary. Development Sites D, F, G, and H include 60 to 70 percent of the area identified as prime farmland, and the remainder is located within the Agricultural Easement area of the Protected Land.

Prime farmlands consist of land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. According to the U.S. Natural Resources Conservation Service, prime farmlands have "an adequate and dependable water supply from precipitation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks." This does not mean that all soils listed as prime farmlands will produce exceptionally high crop yields. The soils on this site that are listed as prime farmland include four fine sandy loams, a loamy fine sand, and a loam.

- c. designated parks, recreation areas, or trails? ☒ Yes ☐ No

The project will not affect existing parks, but includes a possible six-mile canoe route, 11 miles of proposed trails, and development of a number of neighborhood parks, as discussed under the project description (Item 6) and shown on Exhibit 3.

- d. scenic views and vistas? ☐ Yes ☒ No

- e. other unique resources? ☐ Yes ☒ No

If any items are answered Yes, describe the resource and identify any impacts on the resource due to the project. Describe any measures to be taken to minimize or avoid adverse impacts.

27. Will the project create adverse visual impacts? (Examples include: glare from intense lights; lights visible in wilderness areas; and large visible plumes from cooling towers or exhaust stacks.) ☐ Yes ☒ No
If yes, explain.

No adverse visual impacts are expected.

28. **Compatibility with plans** Is the project subject to an adopted local comprehensive land use plan or any other applicable land use, water, or resource management plan of a local, regional, state, or federal agency?
☒ Yes ☐ No If yes, identify the applicable plan(s), discuss the compatibility of the project with the provisions of the plan(s), and explain how any conflicts between the project and the plan(s) will be resolved. If no, explain.

The project area falls under the *City of North Oaks 1998 Comprehensive Plan - Draft 4* (McCombs Frank Roos Associates, May 21, 1998), which has received concept approval from the North Oaks City Council and has been submitted for review and approval by Metropolitan Council. The project proposer has coordinated extensively with City of North Oaks staff and consultants since the fall of 1997 to ensure that the project will be compatible with the Comprehensive Plan and applicable ordinances. The project is compatible with adjacent land uses, City of North Oaks plans and ordinances, and the March 1997 update of the Vadnais Lake Area Water Management Organization *Water Management Plan*. No land use conflicts are anticipated.

29. **Impact on Infrastructure and Public Services** Will new or expanded utilities, roads, other infrastructure, or public services be required to serve the project? ☒ Yes ☐ No
If yes, describe the new or additional infrastructure / services needed. (Any infrastructure that is a "connected action" with respect to the project must be assessed in this EAW; see "EAW Guidelines" for details.)

The project will require extensions to the White Bear Township and City of Shoreview sanitary sewer and water system. Roadways will need to be constructed within each Development Site to provide access to the developments. The effects of these improvements are described throughout this EAW as integral parts of the Development Sites that they will serve. There are no known infrastructure improvements proposed on lands immediately adjacent to the project area that would exceed environmental review thresholds.

30. **Related Developments; Cumulative Impacts**

- a. Are future stages of this development planned or likely? ☐ Yes ☒ No
If yes, briefly describe future stages, their timing, and plans for environmental review.
- b. Is this project a subsequent stage of an earlier project? ☒ Yes ☐ No
If yes, briefly describe the past development, its timing, and any past environmental review.

The project will expand upon the area covered under the *West Black Lake Subdivision EAW* (McCombs Frank Roos Associates, 1993), which was previously completed by the City of North Oaks for a proposal to construct 110 single family homes on a 241-acre site. Approximately 127 acres and 30 single family homes proposed as part of Development Site K of this project fall within the area previously covered by the *West Black Lake Subdivision EAW*.

- c. Is other development anticipated on adjacent lands or outlots? ☒ Yes ☐ No
If yes, briefly describe the development and its relationship to the present project.

The project proposer (North Oaks Company) owns additional property on adjacent lands in the City of Lino Lakes and White Bear Township. Development has not yet been planned or proposed on these lands, but development is anticipated in the future. Any development projects on these lands that exceed environmental review thresholds will need to undergo environmental review under the authority of the respective Responsible Governmental Unit (RGU) in which the project is located.

- d. If a, b, or c were marked Yes, discuss any cumulative environmental impacts resulting from this project and the other development.

Environmental effects of the development described under the previous *West Black Lake Subdivision EAW* (McCombs Frank Roos Associates, 1993) are fairly similar to those described in this EAW for Development Site K. Significant adverse environmental effects are not expected to result from the cumulative effect of development within the City of North Oaks. The preservation and management of 886 acres of Protected Land proposed as part of the East Oaks Planned Unit Development is expected to maintain a relatively rich natural resource base in the project area. It is beyond the scope of this EAW to assess the cumulative impact of unplanned future development on adjacent lands in the City of Lino Lakes and White Bear Township.

31. **Other Potential Environmental Impacts** If the project may cause any adverse environmental impacts which were not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

No other potential environmental impacts are foreseen.

32. **SUMMARY OF ISSUES** *(This section need not be completed if the EAW is being done for EIS scoping; instead, address relevant issues in the draft Scoping Decision document which must accompany the EAW.)* List any impacts and issues identified above that may require further investigation before the project is commenced. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.

Item 9. Land Use. The Phase I Environmental Site Assessment identified a Leaking Underground Storage Tank (LUST) corresponding to the Minnesota Pollution Control Agency's (MPCA's) LUST site 3384. The LUST site will continue to be coordinated with the MPCA and remediated if necessary, until the MPCA closes this file and determines that the contamination has been adequately addressed.

Item 11. Fish, Wildlife, and Ecologically Sensitive Resources. The project is expected to convert approximately 210 acres of grassland and 83 acres of deciduous woodland to a combination of urban landscaping, homes, streets, parking areas, stormwater ponds, and other typical components of residential developments (see Exhibits 2, 4, and 5). Development Sites B, C, and K (Preserve East, Nord, and West Black Lake) will include substantial areas of woodland preservation within the backyards of single family lots that will average two to three acres in size. The woodland to be preserved in these sites will become more fragmented as a result of development. Proposed wetland impacts include a total of approximately 0.35 acres for road crossings. These habitat changes are expected to result in a decline in wildlife abundance within the 12 Development Sites, but the decline in wildlife abundance is not expected to be regionally significant. The preservation of about 445 acres of woodland and 95 acres of grassland is expected to mitigate the loss of wildlife habitat associated with development. The proposed preservation of 886 acres of Protected Land will include about 226 acres of woodland and 49 acres of grassland that will be managed to improve wildlife habitat. The Minnesota DNR Natural Heritage Program conducted a database search to determine if any records exist for occurrences of rare or endangered plants, animals, or communities on or near the site. The search identified 35 occurrences of rare species or natural communities in the area searched. The project is not expected to have significant adverse effects on the rare species or communities. Six of the 35 element occurrences were located within the boundaries of the project.

Item 12. Physical Impacts on Water Resources. Concept Plans prepared for the 12 Development Sites involve a total of approximately 0.35 acres of wetland fill. All wetland impacts will be necessary to construct road crossings that will provide access to portions of the various Development Sites. Replacement of the proposed wetland fill will most likely be provided by debiting the North Oaks Company wetland bank.

Item 13. Water Use. The project area includes 11 known wells that have been located by Kurth Surveying, Inc., and will involve the installation of approximately 80 additional domestic wells to serve the proposed unsewered residential homes. Six of the known wells have been sealed and abandoned, and five wells are currently in use. The five active wells are operated in support of activities located at

the Hill Residence and Farmstead, within the allowable building area covered under the proposed Agricultural Easement. These wells will remain active and continue to be used for domestic water. Any additional domestic wells identified within portions of the site where development is proposed will be sealed and abandoned in compliance with Minnesota Department of Health regulations.

Item 14. Water-related Land Use Management Districts - Shorelands. The project includes Development Sites located partially or entirely within the Shoreland Overlay District of five lakes and one protected watercourse. The proposed project will comply with the density and impervious surface restrictions of City of North Oaks Ordinance No. 84, *An Ordinance for the Management of Shoreland Areas with the City of North Oaks* (March, 1995). Development Sites will be clustered in the least ecologically sensitive areas to avoid adverse effects on shorelands, water quality, and aquatic habitat. Some variances to OHW setback and building height restrictions may be necessary.

Item 17. Erosion and Sedimentation. Based on analysis of soils mapping, 2-foot contour, and 10-foot contour topographic mapping of the site, the project area includes some areas with slopes of 12 to 25 percent, but does not include slopes greater than 25 percent. Development Sites A, B, C, D, and H include little or no steep slopes. Development Sites E, F, G, I, J, K, and L include steep slopes and some steep slopes will be graded in these areas. Because grading on most Development Sites will involve disturbance of more than five acres of land, they will need to be covered under the National Pollutant Discharge Elimination System (NPDES) General Permit for Construction Activities administered by the Minnesota Pollution Control Agency. This permit requires that best management practices (BMP's) be used to control erosion and that erosion controls be inspected after each rainfall exceeding 0.1 inch of precipitation. Erosion control will include practices such as use of temporary sediment basins, silt fencing, rock construction entrances, riprap, and cover crops.

Item 18. Water Quality - Surface Water Runoff. No increase in the rate or decrease in the quality of site runoff is anticipated as a result of the proposed development. Stormwater runoff from all parking and street surfaces will undergo pretreatment in sediment basins before discharging to wetlands. In accordance with VLAWMO (Vadnais Lake Area Water Management Organization) requirements, stormwater detention basins will be designed to limit peak discharge rates for 5- and 100-year storm events to pre-development conditions. Stormwater basins will be designed to meet NURP (Nationwide Urban Runoff Program) guidelines for removal of suspended sediment, phosphorus, and other nutrients from stormwater. The proposed development will likely cause an increase in the stormwater volume and associated sediments and nutrients entering area lakes. Three of these lakes, Charley, Pleasant, and Deep Lake, are considered "high value/high priority" lakes according to the *EAW Guidelines* (Environmental Quality Board, 1990) and activities that may affect these lakes require a nutrient budget analysis. The nutrient budget analysis concluded that the impacts of the potential increase in stormwater on the three lakes will be minimal due to: (1) the use of NURP detention basins and (2) the increase in pollution is small compared to background levels. No significant impacts to Charley, Pleasant, and Deep Lake will occur as a result of the proposed developments.

Item 19. Water Quality - Wastewaters. Out of a total of 645 residential units proposed, 80 will be served by on-site septic systems. Individual sewage treatment systems will be located, designed, and installed in accordance with City ordinances and Minnesota Rules Chapter 7080, *Individual Sewage Systems Treatment Standards*. Soil percolation rates will be determined by on-site testing on a lot-by-lot basis, and lot boundaries will be adjusted where necessary to ensure that each lot will have two 5,000-square-foot sites for on-site sewage treatment systems as required by City ordinance.

Item 21. Solid Wastes; Hazardous Wastes; Storage Tanks. The Phase I Environmental Site Assessment identified a Leaking Underground Storage Tank (LUST) corresponding to the Minnesota Pollution Control Agency's (MPCA's) LUST site 3384, which will continue to be coordinated with the MPCA and remediated if necessary, until the MPCA closes this file and determines that the contamination has been adequately addressed.

Item 22. Traffic. The proposed project is consistent with the land use assumptions used in previous City of North Oaks and Regional Transportation Planning studies. The project will generate approximately 10,884 trips per day and this traffic will be distributed to the surrounding roadway network. Due to the consistency of the project with previous studies, the project is not expected to have significant adverse effects on the regional roadway system.

CERTIFICATIONS BY THE RGU *(all 3 certifications must be signed for EQB acceptance of the EAW for publication of notice in the EQB Monitor)*

I hereby certify that the information contained in this document is accurate and complete to the best of my knowledge.

Signature Nancy P. Rozycki

I hereby certify that the project described in this EAW is the complete project and there are no other projects, project stages, or project components, other than those described in this document, which are related to the project as "connected actions" or "phased actions," as defined, respectively, at Minn. Rules, pts. 4410.0200, subp. 9b and subp. 60.

Signature Nancy P. Rozycki

I hereby certify that copies of the completed EAW are being sent to all points on the official EQB EAW distribution list.

Signature Nancy P. Rozycki

Title of signer Ms. Nancy P. Rozycki, City Clerk

Date August 14, 1998

EXHIBITS 1 - 8



Sources: USGS DRG (1993); MINDOT MNBASE (1998)

East Oaks Planned Unit Development City of North Oaks, Ramsey County, Minnesota

Environmental Assessment Worksheet

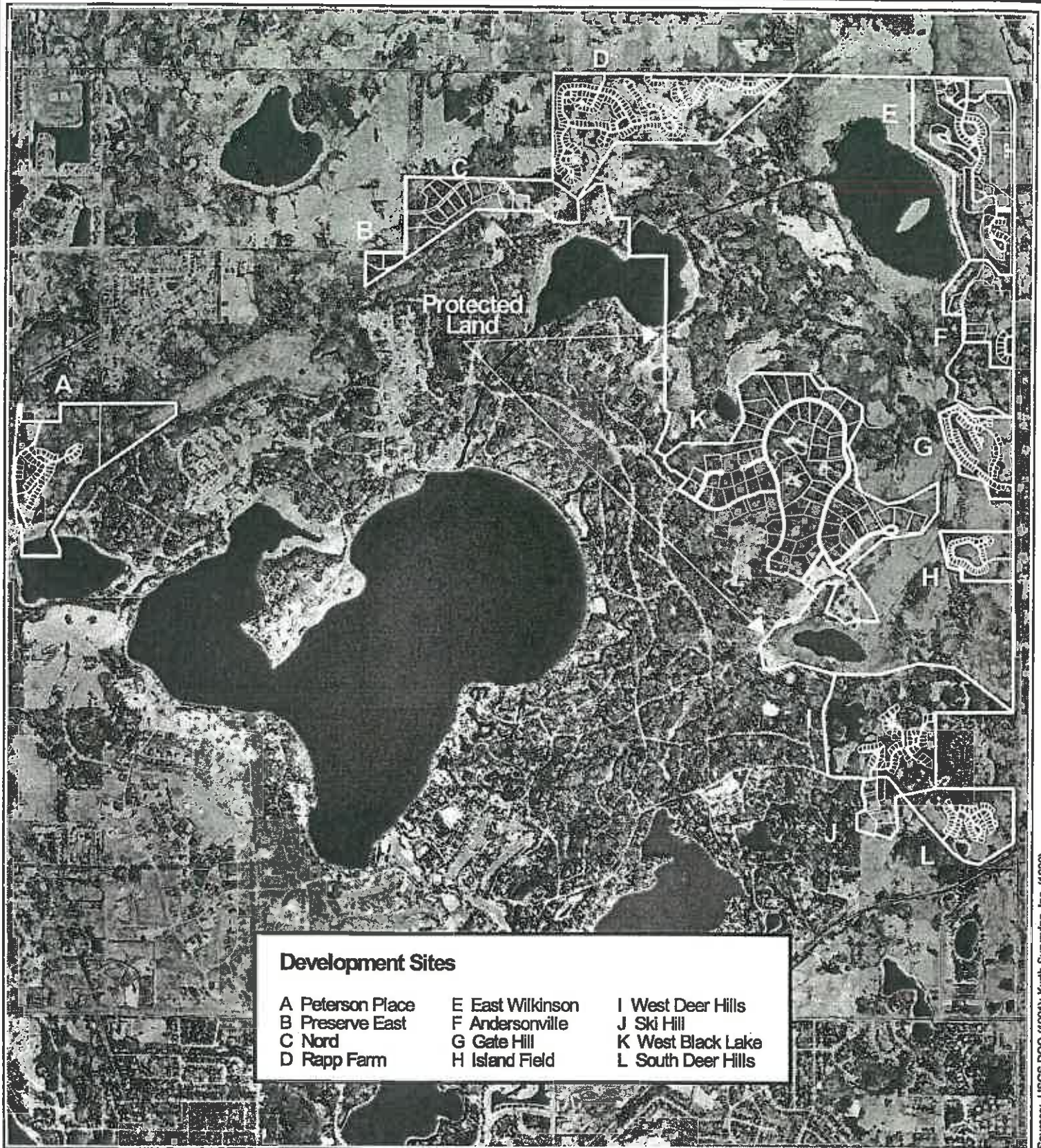
USGS Topography and Site Location

2500 0 2500 Feet



Westwood Professional Services, Inc.
7599 Anagram Drive
Eden Prairie, MN 55344
(612) 937-5150
July, 1998

EXHIBIT 1



Sources: USGS DOQ (1991); Kurth Surveying, Inc. (1998)

East Oaks Planned Unit Development

City of North Oaks, Ramsey County, Minnesota

Environmental Assessment Worksheet

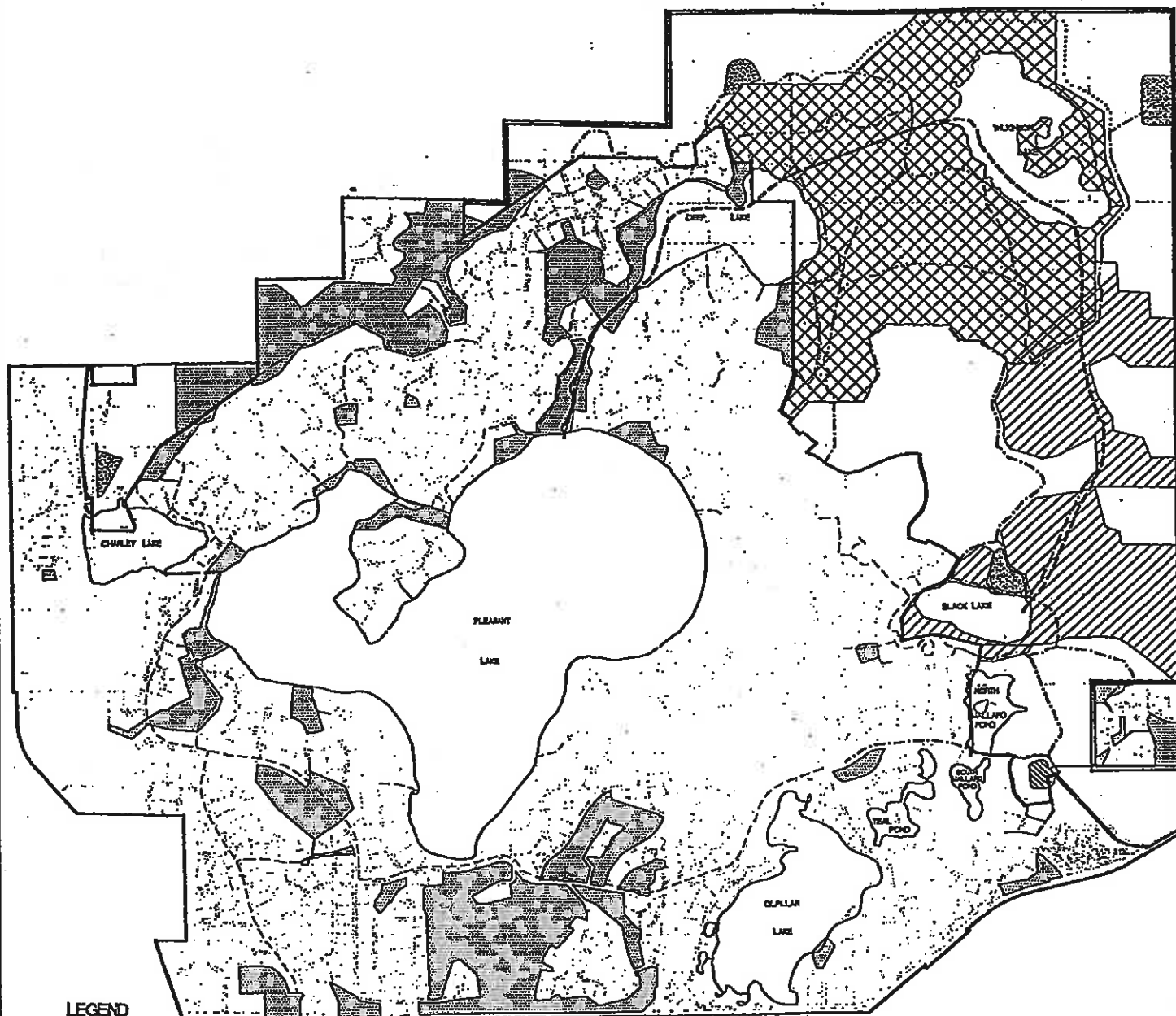
Aerial Photography and Concept Plan

2000 0 2000 Feet



Westwood Professional Services, Inc.
7566 Anagram Drive
Eden Prairie, MN 55344
(612) 937-5150
July, 1998

EXHIBIT 2



LEGEND



FUTURE ACTIVE RECREATION AREAS



FUTURE LINEAR PARK AREAS



CONSERVANCY LAND



CONSERVANCY Aq. LAND



EXISTING RECREATION AND OPEN SPACE



POTENTIAL TRAIL



PROPOSED TRAILS



PROPOSED CANOE ROUTE



EXISTING TRAILS

- FINAL TRAIL AND REC. AREA LOCATIONS TO BE DETERMINED AT THE TIME OF DEVELOPMENT. THIS MAP REPRESENTS GENERAL LOCATIONS.

East Oaks Planned Unit Development

City of North Oaks, Ramsey County, Minnesota

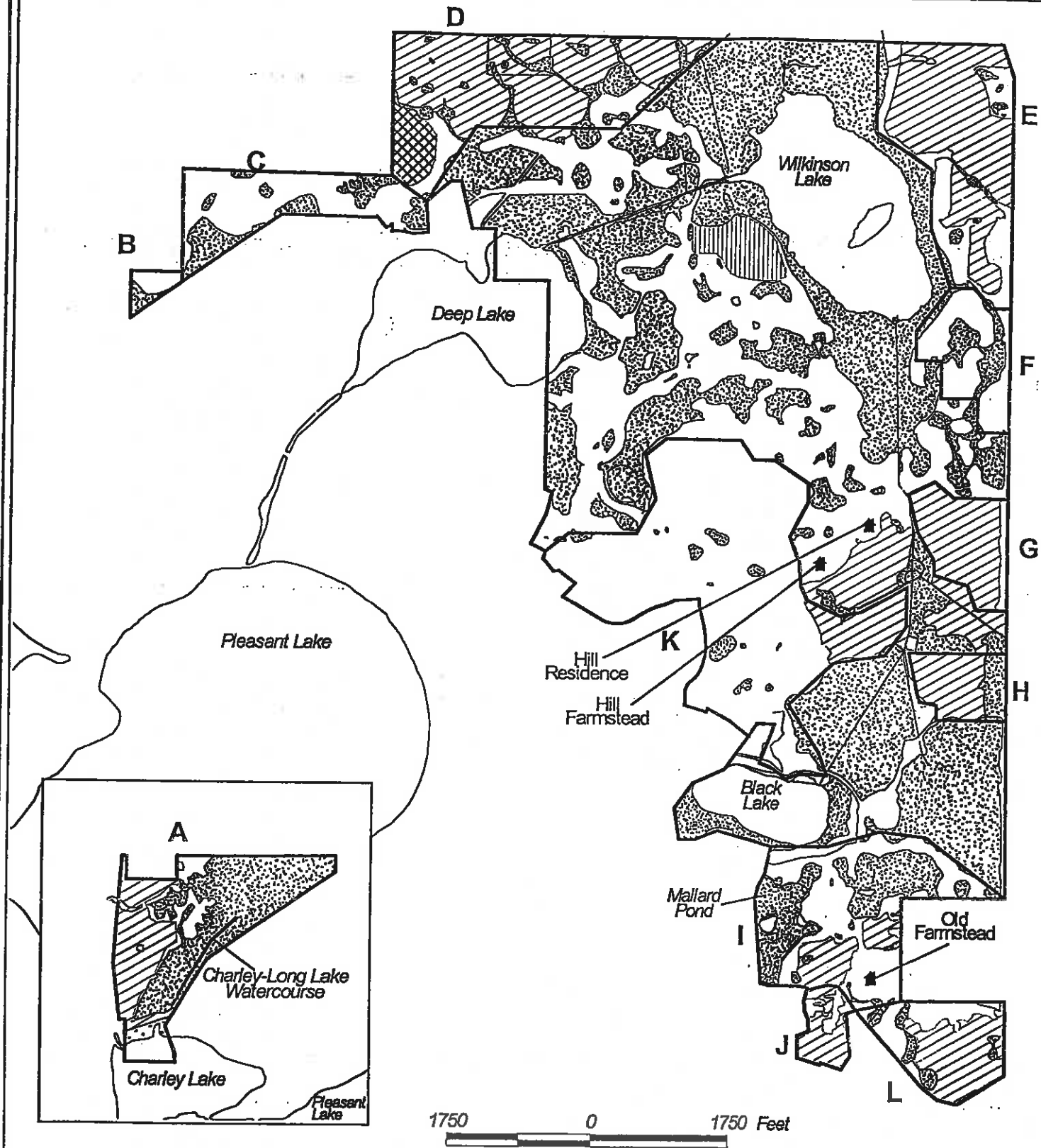
Environmental Assessment Worksheet

Open Space, Parks, and Trails



Westwood Professional Services, Inc.
7599 Anagram Drive
Eden Prairie, MN 55344
(612) 937-5150
July, 1998

EXHIBIT 3



Sources: Kurth Surveying, Inc. (1998); WPS (1998)

East Oaks Planned Unit Development City of North Oaks, Ramsey County, Minnesota

Environmental Assessment Worksheet
Existing Conditions and Development Sites

Legend

- Development Site Boundaries
- Wetland
- Woodland
- Grassland
- Tree Nursery
- Concrete and Sand Stock Pile



Westwood Professional Services, Inc.
7599 Anagram Drive
Eden Prairie, MN 55344
(612) 937-5150
July, 1998

EXHIBIT 4



Sources: USGS DOQ (1991)

East Oaks Planned Unit Development

City of North Oaks, Ramsey County, Minnesota

Environmental Assessment Worksheet

Aerial Photography

2500 0 2500 Feet



Westwood Professional Services, Inc.
7599 Anagram Drive
Eden Prairie, MN 55344
(612) 937-5150
July, 1998

EXHIBIT 5



Sources: USGS DOQ (1991); USFWS NWI (1980)

East Oaks Planned Unit Development City of North Oaks, Ramsey County, Minnesota

Environmental Assessment Worksheet

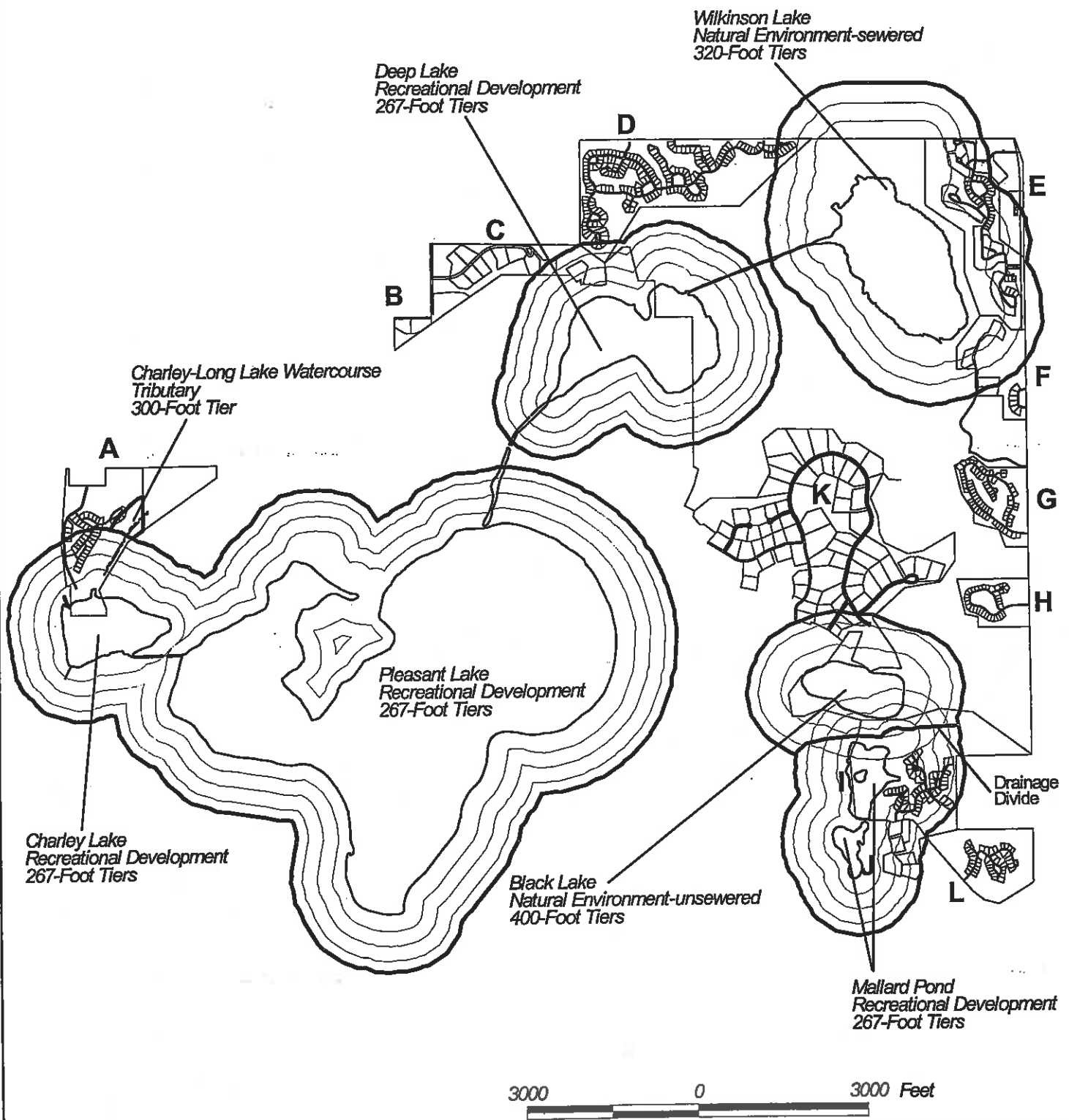
Aerial Photography and National Wetlands Inventory Mapping

2300 0 2300 Feet



Westwood Professional Services, Inc.
7599 Anagram Drive
Eden Prairie, MN 55344
(612) 937-5150
July, 1998

EXHIBIT 6



Sources: Kurth Surveying, Inc. (1988); WPS (1988)

East Oaks Planned Unit Development City of North Oaks, Ramsey County, Minnesota

Environmental Assessment Worksheet

Shoreland Analysis

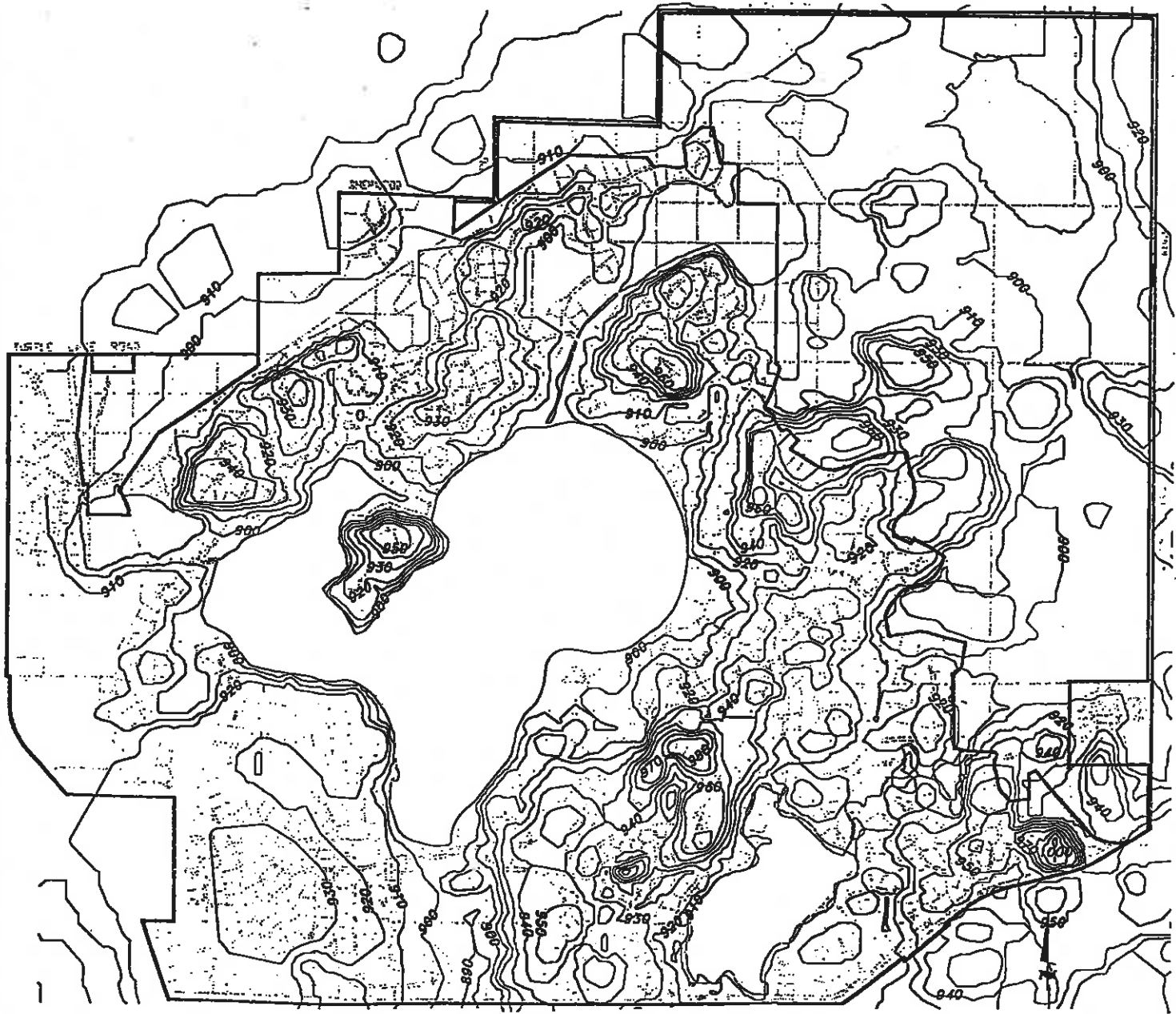
Legend

- 1000-Foot Shoreland District
- Tier (267, 300, 320, or 400 Feet)



Westwood Professional Services, Inc.
7599 Anagram Drive
Eden Prairie, MN 55344
(612) 937-5150
July, 1998

EXHIBIT 7



Sources: City of North Oaks 1988 Comprehensive Plan-Draft 4, McCombs Frank Roos Associates, Inc. May 21, 1988

East Oaks Planned Unit Development City of North Oaks, Ramsey County, Minnesota

Environmental Assessment Worksheet

Existing Topography



Westwood Professional Services, Inc.
 7599 Anagram Drive
 Eden Prairie, MN 55344
 (612) 937-5150
 July, 1988

EXHIBIT 8

APPENDIX A

Conservation Easement

Draft November 12, 1997

CONSERVATION EASEMENT

THIS CONSERVATION EASEMENT is entered into this _____ day of _____, 1998, by and between North Oaks Company LLC, a Minnesota limited liability company, whose address is One, Pleasant Lake Road, North Oaks, MN 55127 ("Owner"), and the Minnesota Land Trust, a Minnesota nonprofit corporation having its principal office in Minneapolis, Minnesota ("Trust").

WITNESSETH:

A. Owner is the sole owner in fee simple, subject to easements and encumbrances of record or executed prior to the date hereof, of certain real property identified as Conservancy Land on Exhibit A, attached hereto and incorporated by this reference, consisting of approximately 620 acres of land located in Ramsey County, Minnesota ("Protected Land").

B. The Protected Land is primarily woodlands, wetlands, riparian areas and open space. In addition, the Protected Land has outstanding biodiversity and scientific/research characteristics that provide excellent water quality and other benefits.

C. The natural and scenic qualities and forested, riparian and open space character ("Conservation Values") of the Protected Land are set forth in a Conservancy Land Management Plan ("Property Report") dated _____, 1998, which the parties acknowledge accurately represents the present condition of the Protected Land, and which outlines proposed activities on the Protected Land to which the parties hereby consent. Each of the parties has a copy of the Property Report. The Trust intends to use the Property Report in monitoring subsequent uses of the Protected Land and enforcing the terms of this Conservation Easement.

D. Owner intends to convey to the Trust the right to preserve and protect the Conservation Values of the Protected Land in perpetuity and to prevent or remedy subsequent activities or uses that are inconsistent with the terms of this Conservation Easement.

E. The grant of this Conservation Easement will serve the policies of the State of Minnesota which encourage the protection of Minnesota's natural resources as set forth, in part, in Minnesota Statutes Section 84C.01-02 (Conservation Easements).

F. The Trust is a publicly supported, nonprofit corporation which protects the natural, scenic, agricultural, forested, and open space conditions of land in Minnesota. In addition, the Trust is qualified as a conservation organization under Sections 501(c)(3) and 170(h) of the Internal Revenue Code. The Trust has agreed to assume the obligation of protecting the natural and scenic qualities of the Protected Land in perpetuity according to the terms of this Conservation Easement.

NOW, THEREFORE, in consideration of their mutual covenants and pursuant to the provisions relating to conservation easements set forth in Minnesota Statutes Sections 84C.01-

.05, Owner conveys to the Trust and the Trust accepts a perpetual conservation easement on the Protected Land of the character and to the extent set forth herein.

1. Intent The parties intend to permanently retain the Protected Land in its predominantly natural and scenic condition and to prevent or remedy any subsequent activity or use that significantly impairs or interferes with the Conservation Values of the Protected Land. Owner intends to restrict all subsequent use of the Protected Land to activities consistent with the terms of this Conservation Easement.

2. Trust's Rights To accomplish the parties' intent, Owner conveys the following rights to the Trust:

A. The Trust shall preserve and protect the Conservation Values of the Protected Land pursuant to the terms of this Conservation Easement.

B. The Trust may enter the Protected Land at reasonable times to monitor subsequent activities and uses and to enforce the terms of this Conservation Easement. The Trust shall give three (3) days written notice to Owner of all such entries and shall not unreasonably interfere with Owner's use and quiet enjoyment of the Protected Land.

C. The Trust may act, pursuant to Paragraph 18, to prevent or remedy all subsequent activities and uses of the Protected Land not consistent with the terms of this Conservation Easement.

3. Prohibited Uses Owner shall not perform or knowingly permit others to perform acts on the Protected Land that would significantly impair or interfere with the Conservation Values of the Protected Land. Acts permitted in Paragraphs 4-13 must be carried out within the overall constraints of this general restriction. The parties acknowledge that (i) the present use of the Protected Land is consistent with the terms of this Conservation Easement and the Owner may continue making such use of the Protected Land, and (ii) activities proposed in the Property. Report will not significantly impair or interfere with the Conservation Values of the Protected Land.

4. Residential, Commercial & Industrial Uses Owner shall not subdivide all or part of the Protected Lands for residential, commercial or industrial development. Owner shall not subdivide, either legally or physically, the Protected Land for any other reason without the prior written approval of the Trust. Owner shall not engage in commercial or industrial activities on the Protected Land. Owner shall not engage in the exploration or extraction of soil, sand, gravel, rock minerals, hydrocarbons or any other natural resource on or from the Protected Land. Owner shall not grant rights of way on the Protected Land in conjunction with commercial or industrial activities or residential development on lands other than the Protected Land, except for utility lines as permitted in Paragraph 6 and other recreational amenities provided for in Paragraph 12.

5. Construction Owner shall not construct or install additional buildings or improvements of any kind including, without limitation, driveways, parking lots, and roads, on the Protected Land, except as specified herein. Owner may maintain, repair, and replace existing roads but shall not widen them unless doing so does not materially increase the environmental impact of the road on the Protected Land and Owner has obtained the prior written approval of the Trust. Owner may maintain, renovate, expand, or replace existing improvements in substantially their present location. Structures permitted under this section include storm shelters, observation decks, canoe racks and trailhead structures as reasonably necessary to serve trail systems permitted by Paragraph 12, as well as bird houses, nesting platforms, etc. Owner may construct parking areas to serve uses permitted under the terms of this Conservation Easement.

6. Utility Systems Owner may maintain, repair, and replace existing utility systems on the Protected Land including, without limitation, water, sewer, power, fuel, and communications lines and related facilities. Owner shall not install new utility systems or extensions of existing utility systems on the Protected Land including, without limitation, water, sewer, power, fuel, and communications lines and related facilities, without the prior approval of the Trust except as needed to serve any additional uses and improvements permitted by the terms of this Conservation Easement. Notwithstanding the foregoing, a new utility easement area through the northerly portion of the Protected Land may be constructed.

7. Surface Alteration Except as otherwise permitted herein, Owner shall not alter the surface of the Protected Land including, without limitation, the filling, excavation, or removal of soil, sand, gravel, rocks, or other material.

8. Soil and Water Degradation Except as otherwise permitted herein, Owner shall not engage in activities or uses that cause or are likely to cause soil degradation, erosion, or water pollution, either on the surface or underground.

9. Waste Removal Owner shall not dump or dispose of refuse or other waste material on the Protected Land although, subject to applicable laws and regulations, Owners may dispose of brush and other organic material from the Protected Land by burning, composting or burying.

10. Water Bodies and Courses Owner shall not alter existing bodies of water or water courses or construct new bodies of water or water courses on the Protected Land except as reasonably required for the activities or uses permitted by the terms of this Conservation Easement and for which Owner has obtained the prior written approval of the Trust. Notwithstanding the foregoing, Owner may alter water bodies and courses for the following specific purposes: a) to enhance wildlife habitat; b) for specific recreational uses that do not cause a significantly negative impact on the wildlife habitat characteristics of the Protected Land; c) for scientific research purposes; and d) for storm water retention that does not cause a significantly negative impact on the wildlife habitat characteristics of the Protected Land.

11. Trees, Shrubs, and Vegetation Owner shall not remove, destroy, cut, mow, or alter trees, shrubs, and other vegetation except (i) for areas immediately adjacent to improvements permitted by Paragraph 5, (ii) to prevent or control insects, noxious weeds, diseases, fire, personal injury, or property damage, (iii) for the removal of invasive, non-native species, (iv) for firewood or construction material, managed in a sustainable manner, (v) as reasonably required to construct and maintain the trails and other recreational facilities permitted in Paragraph 12, (vi) for the relocation of trees and shrubs from nurseries existing on the Protected Land at the date of the execution of this Conservation Easement to other locations within the City of North Oaks, and (vii) for other activities or uses permitted by the terms of this Conservation Easement.

12. Recreational Use Owner may establish and maintain unpaved trails for fire breaks, walking, horseback riding, cross-country skiing, and other non-motorized recreational activities on or across the Protected Land. Owner shall not use or allow others to use motorcycles, all-terrain vehicles, or other motorized vehicles on the Protected Land except as reasonably required for maintenance or other activities or uses permitted by the terms of this Conservation Easement. In addition, Owner may construct a canoe trail and trailhead/canoe access point on the Protected Land, using existing or improved ditch and waterway systems, for recreational and scientific use.

13. Signs Owner shall not erect or install any signs or billboards on the Protected Land except for signs stating the name and address of the Protected Land, announcing the activities or uses permitted by the terms of this Conservation Easement, designating the boundaries of, directions and interpretive notes regarding the Protected Land, restricting entry to or use of the Protected Land, or complying with requirements of governments and their agencies. With the prior written approval of Owner, the Trust may erect or install signs announcing that the Protected Land is subject to this Conservation Easement. For all signs permitted by this Paragraph, the location, number, and design must not significantly diminish the natural and scenic qualities of the Protected Land.

14. Trust's Approval The requirement that Owner obtain the prior written approval of the Trust, wherever it may be found in this Conservation Easement, is intended to let the Trust study the proposed use and decide if it is consistent with this Conservation Easement and maintains or enhances the Conservation Values of the Protected Land. Owner shall submit a request in writing to the Trust at least ninety days prior to the proposed date of commencement of the use in question. The request shall set out the use for which approval is sought, its design and location, the impact of the proposed use on the Conservation Values of the Protected Land, and other material information in sufficient detail to allow the Trust to make an informed judgment that the proposed use is or is not consistent with this Conservation Easement or would adversely affect the Conservation Values of the Protected Land. The Trust shall notify Owner in writing of its decision within sixty days of its receipt of Owner's request. The Trust may withhold its approval only on a reasonable determination that the proposed use would be inconsistent with this Conservation Easement, impairs the Conservation Values of the Protected Land, results in violation of any applicable law or regulation or that it lacks information in sufficient detail to reach an informed judgment that the proposed use is or is not consistent with this Conservation

Easement. The Trust may condition its approval on the Owner's acceptance of modifications which, in the Trust's reasonable judgment, would make the proposed use, as modified, consistent with this Conservation Easement or protects the Conservation Values of the Protected Land.

15. Public Access No right of access by the public to any portion of the Protected Land is conveyed by this Conservation Easement.

16. Reserved Rights Owner reserves all rights accruing from its ownership of the Protected Land including, without limitation, the right to engage in or allow others to engage in all activities or uses of the Protected Land that are not prohibited or limited by this Conservation Easement, the right to exclude all or any of the public from the Protected Land and to sell or transfer all or part of the Protected Land subject to this Conservation Easement. Owner shall employ best efforts to inform all others who exercise any right by or through it on the Protected Land of the terms of this Conservation Easement. Owner shall incorporate by reference the terms of this Conservation Easement in all deeds or other legal instruments by which it transfers any interest, including a leasehold interest, in all or part of the Protected Land. Owner shall give sixty days prior written notification to the Trust of a transfer of all or any part of fee title to the Protected Land.

17. Costs and Liabilities Owner retains all obligations and shall bear all costs and liabilities of any kind accruing from its ownership of the Protected Land including the following responsibilities:

A. Owner shall remain solely responsible for the operations, upkeep, and maintenance of the Protected Land. Owner shall keep the Protected Land free of all liens arising out of work performed for, materials furnished to, or obligations incurred by Owner.

B. Owner shall pay all taxes and assessments levied against the Protected Land. The Trust will assist, to the best of its ability, in Owner's efforts to minimize taxes and assessments levied against the Protected Land.

C. Owner shall remain solely responsible for maintaining liability insurance for its uses of the Protected Land and the Protected Land itself. Liability insurance policies maintained by the Owner covering the Protected Land will name the Trust as an additional named insured. Owner shall hold harmless, indemnify, and defend the Trust from and against all liabilities, penalties, costs, losses, damages, expenses, causes of action, claims, demands, or judgments, including, without limitation, reasonable attorney's fees, arising out of or relating to (i) personal injury, death, or property damage resulting from an act, omission, or condition on or about the Protected Land unless due solely to the negligence or willful act of the Trust, (ii) the obligations retained by Owner to maintain the Protected Land and pay taxes in Paragraphs 17(A) and (B), and (iii) the existence of this Conservation Easement.

18. Enforcement If either party finds at any time that the other party has breached or may

breach the terms of this Conservation Easement, that party may give written notice of the breach to the other and demand action to cure the breach including, without limitation, restoration of the Protected Land. If the party receiving the notice does not cure the breach within thirty days of notice, the other party may commence an action to (i) enforce the terms of this Conservation Easement, (ii) enjoin the breach, ex parte if needed, either temporarily or permanently, (iii) recover damages, (iv) require restoration of the Protected Land to its condition prior to the breach, (v) engage in binding arbitration pursuant to the rules set forth in the Uniform Arbitration Act, Minnesota Statutes Sections 572.08 - 572.30, (vi) engage in nonbinding arbitration pursuant to rules acceptable to the parties, and/or (vii) pursue any other remedies available to it in law or equity. If, in its sole discretion, the Trust determines that immediate action is needed to prevent or mitigate significant damage to the Protected Land, the Trust may pursue its remedies under this Paragraph without written notice or giving Owner time to cure the breach.

19. Costs of Enforcement If the Trust prevails in an action brought under Paragraph 18, Owner shall reimburse the Trust for all costs incurred by the Trust in enforcing the terms of this Conservation Easement including, without limitation, costs of suit, reasonable attorney's fees, and costs of restoration. If Owner prevails, the Trust shall reimburse Owner's costs of defense including, without limitation, costs of suit and reasonable attorney's fees.

20. Waiver The enforcement of the terms of this Conservation Easement is subject to the Trust's discretion. A decision by the Trust not to exercise its rights of enforcement in the event of a breach of a term of this Conservation Easement shall not constitute a waiver by the Trust of such term, any subsequent breach of the same or any other term, or any of the Trust's rights under this Conservation Easement. The delay or omission by the Trust to discover a breach by Owner or to exercise a right of enforcement as to such breach shall not impair or waive its rights of enforcement against Owner.

21. Acts Beyond Owner's Control The Trust shall not exercise its rights of enforcement against Owner for injury or alteration to the Protected Land resulting from causes beyond the reasonable control of Owner including, without limitation, fire, flood, storm, and earth movement, acts of third parties, or from any prudent action taken by Owner under emergency conditions to prevent, abate, or mitigate significant injury or alteration to the Protected Land or human life resulting from such causes.

22. Extinguishment If subsequent unexpected changes in the conditions surrounding the Protected Land make it impossible to preserve and protect the Conservation Values of the Protected Land, this Conservation Easement can only be extinguished, either all or in part, by proceedings in a court having jurisdiction. The amount of proceeds to which the Trust is entitled from an extinguishment shall be used consistent with the preservation and protection of the natural and scenic qualities of land in Minnesota, and shall be applied to a qualified organization operating in the City of North Oaks, if such exists on the date of extinguishment.

23. Proceeds To establish the amount of proceeds to which the Trust is entitled on

extinguishment, the parties agree that this Conservation Easement has a fair market value ascertained by a licensed appraiser at the time of the extinguishment of this Conservation Easement.

24. Assignment of Easement The Trust may transfer its rights and obligations in this Conservation Easement only to a qualified conservation organization, as provided in Section 170(h) of the Internal Revenue Code, which may hold conservation easements, as provided in Minnesota Statutes Sec. 84C.01(2) (1992). As a condition of such transfer, the Trust shall require the continued enforcement of this Conservation Easement.

25. Notices Any notice or other communication that either party wishes to or must give to the other shall be in writing and either served personally or sent by first class mail, postage prepaid, to the following addresses or such other address as either party shall designate by written notice to the other:

OWNER:
North Oaks Company LLC
One, Pleasant Lake Road
North Oaks, MN 55127
Attn: Chief Executive Officer

TRUST:
Minnesota Land Trust
70 North 22nd Avenue
Minneapolis, MN 55411-2237
Attn: Land Projects Committee

26. Governing Law and Construction This Conservation Easement shall be governed by the laws of Minnesota.

27. Entire Agreement This Conservation Easement sets forth the entire agreement of the parties and supersedes all prior discussions.

28. Amendment The parties may amend this Conservation Easement only by written instrument, the terms of which are mutually agreeable to the parties.

29. No Third Party Recourse or Rights Third parties shall have no recourse or rights against the Trust or the Owner under this Conservation Easement. This Conservation Easement may be enforced only by the Owner or the Trust.

30. Binding Effect The covenants, terms, conditions, and restrictions of this Conservation Easement shall bind and inure to the benefit of the parties, their personal representatives, heirs, successors, assigns, and all others who exercise any right by or through them and shall run in perpetuity with the Protected Land.

North Oaks Conservation Easement
Page 8

OWNER:

NORTH OAKS COMPANY LLC

By _____
Its _____

TRUST:

MINNESOTA LAND TRUST

By _____
David B. Hartwell, President

STATE OF MINNESOTA
COUNTY OF RAMSEY

This instrument was acknowledged before me this ____ day of _____, 1998,
by _____, the _____ of North Oaks Company,
LLC, a Minnesota limited liability company.

Notary Public

STATE OF MINNESOTA
COUNTY OF HENNEPIN

This instrument was acknowledged before me this ____ day of _____, 1998,
before me by David B. Hartwell, President of Minnesota Land Trust, a nonprofit Minnesota
corporation.

Notary Public

This instrument was drafted by:
Minnesota Land Trust
70 North 22nd Avenue
Minneapolis, MN 55411-2237
(612) 522-3743

APPENDIX B

Wildlife and Aquatic Plant Species

Noted on Protected Land

EXHIBIT E1B

SCIENTIFIC NAMES OF BIRD SPECIES NOTED ON PROTECTED LAND

Common Loon
Pied-billed Grebe
Horned Grebe
Red-necked Grebe
American White Pelican
Double-crested cormorant
American Bittern
Least Bittern
Great-blue Heron
Great Egret
Green-backed Heron
Black-crowned Night-Heron
Tundra Swan
Trumpeter Swan
Canada Goose
Wood Duck
Green-winged Teal
Mallard
Northern Pintail
Blue-winged Teal
Northern Shoveler
Gadwall
American Wigeon
Canvasback
Redhead
Ring-necked Duck
Greater Scaup
Lesser Scaup
Common Goldeneye
Bufflehead
Hooded Merganser
Common Merganser
Red-breasted Merganser
Ruddy Duck

Gavia immer
Podiceps caspicus
Podiceps auritus
Podiceps grisegena
Pelecanus erythrorhynchos
Phalacrocorax auritus
Botaurus lentiginosus
Ixobrychus exilis
Ardea herodias
Casmerodius albus
Butorides striatus
Nycticorax nycticorax
Cygnus columbianus
Cygnus buccinator
Branta canadensis
Aix sponsa
Anas crecca
Anas platyrhynchos
Anas acuta
Anas discors
Anas clypeata
Anas strepera
Anas americana
Aythya valisineria
Aythya americana
Aythya collaris
Aythya marila
Aythya affinis
Bucephala clangula
Bucephala albeola
Lophodytes cucullatus
Mergus merganser
Mergus serrator
Oxyura jamaicensis

Turkey Vulture
Osprey
Bald Eagle
Northern Harrier
Sharp-shinned Hawk
Cooper's Hawk
Red-shouldered Hawk
Broad-winged Hawk
Red-tailed hawk
Rough-legged Hawk
Golden Eagle
American Kestrel
Ring-necked Pheasant
Ruffed Grouse
Virginia Rail
Sora
American Coot
Sandhill Crane
Killdeer
Lesser Yellowlegs
Solitary Sandpiper
Spotted Sandpiper
Common Snipe
American Woodcock
Ring-billed Gull
Herring Gull
Common Tern
Forster's Tern
Black Tern
Rock Dove
Mourning Dove
Black-billed Cuckoo
Great-horned Owl
Barred Owl
Common Nighthawk
Chimney Swift
Ruby-throated Hummingbird
Belted Kingfisher
Red-headed Woodpecker
Red-bellied Woodpecker
Yellow-bellied Sapsucker
Downy Woodpecker
Hairy Woodpecker

Cathartes aura
Pandion haliaetus
Haliaeetus leucocephalus
Circus cyaneus
Accipiter striatus
Accipiter cooperii
Buteo lineatus
Buteo platypterus
Buteo jamaicensis
Buteo lagopus
Aquila chrysaetos
Falco sparverius
Phasianus colchicus
Bonasa umbellus
Rallus limicola
Porzana carolina
Fulica americana
Grus canadensis
Charadrius vociferus
Tringa flavipes
Tringa solitaria
Actitis macularia
Gallinago gallinago
Scolopax minor
Larus delewarensis
Larus argentatus
Sterna hirundo
Sterna forsteri
Chlidonias niger
Columbia livia
Zenaida macroura
Coccyzus erythrophthalmus
Bubo virginianus
Strix varia
Chordeiles minor
Chaetura pelagica
Archilochus colubris
Ceryle alcyon
Melanerpes erythrocephalus
Melanerpes carolinus
Sphyrapicus varius
Picoides pubescens
Picoides villosus

Northern Flicker
 Pileated Woodpecker
 Eastern Wood-Pewee
 Alder Flycatcher
 Willow Flycatcher
 Least Flycatcher
 Eastern Phoebe
 Great-crested Flycatcher
 Eastern Kingbird
 Purple Martin
 Tree Swallow
 Northern Rough-winged Swallow
 Bank Swallow
 Cliff Swallow
 Barn Swallow
 Blue Jay
 Common Crow
 Black-capped Chickadee
 Red-breasted Nuthatch
 White-breasted Nuthatch
 Brown Creeper
 House Wren
 Marsh Wren
 Golden-crowned Kinglet
 Ruby-crowned Kinglet
 Blue-gray Gnatcatcher
 Eastern Bluebird
 Veery
 Swainson's Thrush
 Hermit Thrush
 Wood Thrush
 American Robin
 Gray Catbird
 Brown Thrasher
 Cedar Waxwing
 European Starling
 Solitary Vireo
 Yellow-throated Vireo
 Red-eyed Vireo
 Golden-winged Warbler
 Tennessee Warbler
 Orange-crowned Warbler
 Nashville Warbler

Colaptes auratus
Dryocopus pileatus
Contopus virens
Epidonax alnorum
Epidonax traillii
Epidonax minimus
Sayornis phoebe
Myiarchus crinitus
Tyrannus tyrannus
Progne subis
Tachycineta bicolor
Stelgidopteryx serripennis
Riparia riparia
Hirundo pyrrhonota
Hirundo rustica
Cyanactta cristata
Corvus brachyrhynchos
Parus atricapillus
Sitta canadensis
Sitta carolinensis
Certhia americana
Troglodytes aedon
Cistothorus palustris
Regulus satrapa
Regulus calendula
Polioptila caerulea
Sialia sialis
Catharus fuscescens
Hylocichla ustulatus
Catharus guttatus
Hylocichla mustelina
Turdus migratorius
Dumetella carolinensis
Toxostoma rufum
Bombycilla cedrorum
Sturnus Vulgaris
Vireo solitarius
Vireo flavifrons
Vireo olivaceus
Vermivora chrysoptera
Vermivora peregrina
Vermivora celata
Vermivora ruficapilla

Yellow Warbler
 Chestnut-sided Warbler
 Magnolia Warbler
 Yellow-rumped Warbler
 Black-throated Green Warbler
 Blackburnian Warbler
 Pine Warbler
 Palm Warbler
 Bay-breasted Warbler
 Blackpoll Warbler
 Black-and-white Warbler
 American Redstart
 Ovenbird
 Northern Waterthrush
 Louisiana Waterthrush
 Mourning Warbler
 Common Yellowthroat
 Wilson's Warbler
 Canada Warbler
 Scarlet Tanager
 Northern Cardinal
 Rose-breasted Grosbeak
 Indigo Bunting
 American Tree Sparrow
 Chipping Sparrow
 Field Sparrow
 Fox Sparrow
 Song Sparrow
 Lincoln's Sparrow
 Swamp Sparrow
 White-throated Sparrow
 White-crowned Sparrow
 Harris' Sparrow
 Dark-eyed Junco
 Snow Bunting
 Red-winged Blackbird
 Western Meadowlark
 Yellow-headed Blackbird
 Rusty Blackbird
 Brewer's Blackbird
 Common Grackle
 Brown-headed Cowbird
 Northern Oriole

Dendroica petechia
Dendroica pensylvanica
Dendroica magnolia
Dendroica coronata
Dendroica virens
Dendroica fusca
Dendroica pinus
Dendroica palmarum
Dendroica castanea
Dendroica striata
Mniotilta varia
Setophaga ruticilla
Seiurus aurocapillus
Seiurus noveboracensis
Seiurus motacilla
Oporornis philadelphia
Geothlypis trichas
Wilsonia pusilla
Wilsonia canadensis
Piranga olivacea
Cardinalis cardinalis
Pheucticus ludovicianus
Passerina cyanea
Spizella arborea
Spizella passerina
Spizella pusilla
Passerella iliaca
Melospiza melodia
Melospiza lincolnii
Melospiza georgiana
Zonotrichia albicollis
Zonotrichia leucophrys
Zonotrichia querula
Junco hyemalis
Plectrophenax nivalis
Agelaius phoeniceus
Sturnella neglecta
Xanthocephalus xanthocephalus
Euphagus carolinus
Euphagus cyanocephalus
Quiscalus quiscula
Molothrus ater
Icterus galbula

Purple Finch
House Finch
Common Redpoll
Pine Siskin
American Goldfinch
House Sparrow

Carpodacus purpureus
Carpodacus mexicanus
Carduelis flammea
Carduelis spinus
Carduelis tristis
Passer domesticus

SCIENTIFIC NAMES OF MAMMALS NOTED ON PROTECTED LAND

Masked Shrew
Arctic Shrew
Shorttail Shrew
Eastern Mole
Little Brown Bat
River Otter
Shorttail Weasel
Mink
Red Fox
Coyote
Striped Skunk
Woodchuck
Raccoon
Eastern Chipmunk
Red Squirrel
Gray Squirrel
Fox Squirrel
Plains Pocket Gopher
White-footed Mouse
Deer Mouse
Redback Vole
Common Meadow Vole
Muskrat
Eastern Cottontail
White-tailed Deer

Sorex cinereus
Sorex arcticus
Blarina brevicauda
Scalopus aquaticus
Myotis lucifugus
Lutra canadensis
Mustela erminea
Mustela vison
Vulpes vulpes
Canis latrans
Mephitis mephitis
Marmota monax
Procyon lotor
Tamias striatus
Tamiasciurus hudsonicus
Sciurus carolinensis
Sciurus niger
Geomys bursarius
Peromyscus leucopus
Peromyscus maniculatus
Clethrionomys gapperi
Microtus pennsylvanicus
Ondatra zibethicus
Sylvilagus floridanus
Odocoileus virginianus

SCIENTIFIC NAMES OF REPTILES AND AMPHIBIANS NOTED ON PROTECTED LAND

Species

Painted Turtle	<i>Chrysemys picta</i>
Snapping Turtle	<i>Chelydra serpentina</i>
Northern Leopard Frog	<i>Rana pipiens</i>
Gray Tree Frog	<i>Hyla versicolor</i>
Wood Frog	<i>Rana sylvatica</i>
Northern Spring Peeper	<i>Hyla crucifer</i>
American Toad	<i>Bufo americanus</i>
Eastern Garter Snake	<i>Thamnophis sirtalis</i>
Red-bellied Snake	<i>Storeria occipitomaculata</i>
Eastern Tiger Salamander	<i>Ambystoma tigrinum</i>

SCIENTIFIC NAMES OF AQUATIC PLANTS NOTED ON PROTECTED LAND (WILKINSON LAKE)

Coontail	<i>Ceratophyllum demersum</i>
White Water Lilly	<i>Nymphaea tuberosa</i>
Sago Pondweed	<i>Potamogeton pectinatus</i>
Curled(Crisp) Pondweed	<i>Potamogeton crispus</i>
Water Smartweed	<i>Polygonum amphibium</i>
Lesser(Little) Duckweed	<i>Lemna minor</i>
Softstem Bullrush	<i>Scirpus validus</i>
Broad-leaved Arrowhead	<i>Sagittaria latifolia</i>
Water Willow	<i>Decodon verticillatus</i>
Leafy Pondweed	<i>Potamogeton foliosus</i>
Bushy Pondweed	<i>Najas flexilis</i>
Big Duckweed	<i>Spirodela polyrhiza</i>
Slender Pondweed	<i>Potamogeton pusillus</i>
Yellow Water Lilly	<i>Nuphar advena</i>
Burreed	<i>Sparganium sp.</i>
Chufa	<i>Cyperus esculentus</i>
Flatstem Pondweed	<i>Potamogeton zosteriformis</i>
Muskgrass	<i>Chara sp.</i>
Common Bladderwort	<i>Utricularia vulgaris</i>

Common Elodea
Big Duckweed
Water Willow
Cattail
Softstem Bulrush

Elodea canadensis
Spirodela polyrhiza
Decodon verticillatus
Typha latifolia
Scirpus validus

APPENDIX C

DNR Natural Heritage Database Search



Minnesota Department of Natural Resources

Natural Heritage and Nongame Research Program, Box 25

500 Lafayette Road

St. Paul, Minnesota 55155-4000

Phone: (612) 296-8319

Fax: (612) 296-1811

E-mail: karen.cieminski@dnr.state.mn.us

December 30, 1997

Kathryn R. Fernholz
Westwood Professional Services, Inc.
7599 Anagram Drive
Eden Prairie, MN 55344-2039

RECEIVED

JAN - 5 1998

WESTWOOD
PROFESSIONAL SERVICES

Re: Request for Natural Heritage information for vicinity of proposed **East Oaks Planned Residential Development**; T30N R22W Sec. 4-6, 8, 9, 16, 17 & T30N R23W Sec. 6, 12.

Dear Ms. Fernholz,

The Minnesota Natural Heritage database has been reviewed to determine if any rare plant or animal species or other significant natural features are known to occur within an approximate one-mile radius of the area indicated on the map enclosed with your information request. Based on this review, there are 35 known occurrences of rare species or natural communities in the area searched (see attachment).

Please see the enclosed map, which indicates the elements that are most likely to be impacted by the proposed project. These are also marked on the enclosed printout with a red check. Also enclosed are fact sheets for most of the rare elements. There is no fact sheet available for the Acadian flycatcher. Acadian flycatchers breed in mature or fairly mature damp forests. They prefer deciduous floodplain or bottomland forests, preferably with deep shade. Forests with little undergrowth are preferred, because Acadian flycatchers feed on aerial insects in the open space beneath the tree canopy. This species has been recorded as breeding species in Minnesota only since approximately 1950, and as recently as 1975, were considered restricted mainly to Houston County.

I noticed that your development plans include the retention of open space. Certainly the natural communities (in blue and green on the map), or portions of them, would be good candidates for this type of action. I would also like to encourage you to consider preserving habitat required by the rare species, especially the Blanding's turtle and water willow. If you would like assistance or have further questions regarding how to preserve these rare features when designing your development, feel free to contact our Regional Plant Ecologist, Hannah Dunevitz, at (612) 282-2510.

The Natural Heritage database is maintained by the Natural Heritage and Nongame Research Program, a unit within the Section of Ecological Services, Department of Natural Resources. It is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, natural communities, and other natural features. Its purpose is to foster better understanding and protection of these features. *The enclosed locational information may be of a sensitive nature. Please do not distribute specific locational information on rare species to outside parties unnecessarily.*

Because our information is not based on a comprehensive survey, there may be rare or otherwise significant natural features in the state that are not represented in the database. A county-by-county inventory of rare natural features is now underway, and has been completed for Ramsey County. Our information about natural communities is, therefore, quite thorough for that county. However, because survey work for rare plants and animals is less exhaustive, and because there has

DNR Information: 612-296-6157, 1-800-766-6000 • TTY: 612-296-5484, 1-800-657-3929

An Equal Opportunity Employer
Who Values Diversity



Printed on Recycled Paper Containing a
Minimum of 10% Post-Consumer Waste

not been an on-site survey of all areas of the county, ecologically significant features for which we have no records may exist on the project area.

Please be aware that review by the Natural Heritage and Nongame Research Program focuses only on rare natural features. It does not constitute review or approval by the Department of Natural Resources as a whole.

An invoice for the work completed is enclosed. You are being billed for map and database search and staff scientist review. Please forward this invoice to your Accounts Payable Department. Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources.

Sincerely,



Karen L. Cieminski
Data Manager / Ecologist

encl: map - rare features in the vicinity of the proposed East Oaks development
database search results - rare features in the vicinity of the proposed East Oaks development
fact sheets, in order as they appear on database search results - dry oak forest, cattail marsh,
water willow, Blanding's turtle, willow swamp, rich fen, red-shouldered hawk
site reports - North Oaks Natural Area, Long Lake Wetlands

ES# 980414

Minnesota Natural Heritage Database
Element Occurrence Records

EAST OAKS PLANNED RESIDENTIAL DEVELOPMENT
T30N R22W SECS. 4-6,8,9,16,17 & T30N R23W S. 6
MnDNR, Natural Heritage and Nongame Research Program

17:29 Thursday, DECEMBER 11, 1997
Copyright 1997 State of Minnesota DNR

TWP	RNG	SECTION	FED STATUS	MN STATUS	S RANK	CLASS	ELEMENT and OCCURRENCE NUMBER	MANAGED AREA
T030N	R22W	OSSE05			S5	NC	✓CATTAIL MARSH #1	
T030N	R22W	NWNE08SE05		SPC		SP	✓DECODON VERTICILLATUS (WATERWILLOW) #11	
T030N	R22W	SENE05		SPC		SP	✓DECODON VERTICILLATUS (WATERWILLOW) #16	
T030N	R22W	SW05		THR		SA	✓EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #312	
T030N	R22W	OE08SE05			S3	NC	✓OAK FOREST (CENTRAL) DRY SUBTYPE #55	
T030N	R22W	SWSW06			S5	NC	✓CATTAIL MARSH #4	
T030N	R22W	ON06		THR		SA	EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #311	
T030N	R22W	06		THR		SP	ROTALA RAMOSIOR (TOOTH-CUP) #9	
T030N	R22W	SW06			S4	NC	✓WILLOW SWAMP #3	POPLAR LAKE OPEN SPACE
T030N	R22W	NWSW08		SPC		SA	✓BUTEO LINEATUS (RED-SHOULDERED HAWK) #54	POPLAR LAKE OPEN SPACE
T030N	R22W	NESE08			S3	NC	✓RICH FEN (TRANSITION) SHRUB SUBTYPE #1	
T030N	R22W	SE08SW09			S5	NC	✓CATTAIL MARSH #2	
T030N	R22W	NWNE15		THR		SA	EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #761	
T030N	R22W	ON15NE16			S2	NC	✓DRY PRAIRIE (CENTRAL) SAND-GRAVEL SUBTYPE #6	
T030N	R22W	NWNE17		SPC		SA	✓EMPIDONAX VIRESCENS (ACADIAN FLYCATCHER) #42	
T030N	R22W	SWNE17		THR		SA	✓EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #22	
T030N	R22W	SWNW19			S5	NC	✓ALDER SWAMP #11	
T030N	R22W	OWNW19			S5	NC	✓ALDER SWAMP #12	
T030N	R22W	19		THR		SA	EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #41	GRASS-VADNAIS (SNAIL LAKE) REGIONAL PARK
T030N	R22W	SW19			S3	NC	✓RICH FEN (TRANSITION) SEDGE SUBTYPE #3	GRASS-VADNAIS (SNAIL LAKE) REGIONAL PARK
T030N	R22W	SESW19			S4	NC	✓WILLOW SWAMP #4	GRASS-VADNAIS (SNAIL LAKE) REGIONAL PARK
T030N	R22W	SW20		THR		SA	EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #506	
T030N	R22W	NWSE21		THR		SA	EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #310	
T030N	R22W	NWSW22		THR		SA	EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #308	
T030N	R22W	NWSWSW22		THR		SA	EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #806	
T030N	R23W	SWNE01		THR		SA	✓EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #309	POPLAR LAKE OPEN SPACE
T030N	R23W	SWNE01		THR		SA	✓EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #807	
T030N	R23W	NW02		THR		SA	✓EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #153	
T030N	R23W	SENE02		THR		SA	EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #424	
T030N	R23W	OSNE05			S3	NC	✓RICH FEN (TRANSITION) SEDGE SUBTYPE #4	COUNTY DITCH & OPEN SPACE
T030N	R23W	SW14		THR		SA	EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #776	
T030N	R24W	01		SPC		SA	✓PITUOPHIS CATENIFER (GOPHER SNAKE) #16	
T031N	R22W	35		THR		SA	EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #28	
T031N	R22W	NWSE35		THR		SA	EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #567	
T031N	R23W	NESW32		THR		SA	EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #284	

EAST OAKS PLANNED RESIDENTIAL DEVELOPMENT

Minnesota Natural Heritage Database
Element Occurrence Records

T30N R22W SECS. 4-6,8,9,16,17 & T30N R23W SECS. 6,12
MnDNR, Natural Heritage and Nongame Research Program

17:29 Thursday, DECEMBER 11, 1997
Copyright 1997 State of Minnesota DNR

T030N R22W 0SSE05 RAMSEY COUNTY, MN

Element: CATTAIL MARSH #1
S Rank: S5

EO Size: EO Rank: B
Site: NORTH OAKS NATURAL AREA

Ownership: Private

Managed Area(s): not managed or no record

Source: ALMENDINGER, J.C. (CO BIOL SURVEY 1990)

NICE NATIVE MARSH W/ MOAT AND QUAKING MAT. PATCHES OF DENSE TYPHA ANG. AND T. LA TIPOLIA, BUT MOSTLY WITH CATTAILS SCATTERED, MIXED W/ SCIRPUS VALIDUS, GLYCERIA GRANDIS, CAREX LACUST., AND CALAMAGROSTIS CAN. DULICHUM ARUN. COMMON BENEATH. TYPICAL FORB COMPONENT: CAMPANULA APAR., SAGITTARIA LAT., RUMEX ORB., LYCOPUS UN. THELYPTERIS PAL., VERBENA HAST., ETC. WILLOW AND SPIREA TOMENTOSA SCATTERED. DECODON VERTICILLATUS OCCASIONAL ON WEST END.

Last Observed Date: 01 August 1990

Current Status: 0
Intended Status: 1
CBS Site #: 30

Quad Map: WHITE BEAR LAKE WEST (R17D)
Latitude: 45 6' 40" Long: 93 4' 10"

Precision: approx. boundaries have been determined

Voucher:

Verification: verified

T030N R22W 0SSE05 RAMSEY COUNTY, MN

Element: DECODON VERTICILLATUS (WATERWILLOW) #11

State Status: SPECIAL CONCERN

EO Size: EO Rank: AB

Site: NORTH OAKS NATURAL AREA

Ownership: Private

Managed Area(s): not managed or no record

Source: MALODY, K. (PHOTO RECORD)

1992: 2 LARGE COLONIES ON SW & NE EDGES OF OPEN WATER AT S END OF MARSH; ALSO A FEW PLANTS AT WATERS EDGE BTWN LARGE COLONIES. PLANTS FLOWERING & REPRODUCING VEGETATIVELY. 1990: ON 01 AUG, J. ALMENDINGER (CBS 1990) OBS INDIVIDUALS SCATTERED IN MOAT WITH TYPHA ANG, SCIRPUS VAL, GLYCERIA GRANDIS, CAREX LACUSTRIS, CLAMAGROSTIS CAN. DULICHUM ARUN ABUNDANT BENEATH TALLER GRAMINOIDES. MOAT VERY WET & QUAKING.

*** SITE THREATENED ***

Last Observed Date: 18 July 1992

Intended Status:
CBS Site #: 30

Quad Map: WHITE BEAR LAKE WEST (R17D)
Latitude: 45 6' 34" Long: 93 4' 24"

Precision: within 0.25 mile, confirmed

Voucher:

Verification: photo rec.

T030N R22W 0SSE05 RAMSEY COUNTY, MN

Element: DECODON VERTICILLATUS (WATERWILLOW) #16

State Status: SPECIAL CONCERN

EO Size: EO Rank: BC

Site: NORTH OAKS NATURAL AREA

Ownership: Private

Managed Area(s): not managed or no record

Source: MALODY, K. (SIGHT RECORD)

TWO DECODON VERTICILLATUS COLONIES IDENTIFIED AT WATERS EDGE OF EXTENSIVE FLOATING CATTAIL MAT. NOT POSSIBLE TO ASCERTAIN THE EXTENT OF COLONIES FROM THE SHORE SIDE OF MAT. COLONIES LOCATED ON WESTERN SIDE OF WILKINSON LAKE, SOUTH OF THE CANAL.

Last Observed Date: 18 July 1992

Intended Status:
CBS Site #: 30

Quad Map: WHITE BEAR LAKE WEST (R17D)
Latitude: 45 7' 0" Long: 93 4' 0"

Precision: within 0.25 mile, confirmed

Voucher:

Verification: sight or sound rec.

T030N R22W SW05 RAMSEY COUNTY, MN

Element: EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #312

State Status: THREATENED

EO Size: EO Rank:

Site: NORTH OAKS NATURAL AREA

Ownership: Owner unknown

Managed Area(s): not managed or no record

Source: MILLER, D. (1988 TURTLE SURVEY)

1 TURTLE OBSERVED IN BACKYARD BY DEEP LAKE.

Last Observed Date: 10 May 1988

Intended Status:
CBS Site #: 30

Quad Map: WHITE BEAR LAKE WEST (R17D)
Latitude: 45 6' 47" Long: 93 4' 59"

Precision: within 0.25 mile, confirmed

Voucher:

Verification: sight or sound rec.

Minnesota Natural Heritage Database
 Element Occurrence Records
 T30N R22W 06 RAMSEY COUNTY, MN
 Element: OAK FOREST (CENTRAL) DRY SUBTYPE #55
 S Rank: S3
 EO Size: EO Rank: CD Current Status: Intended Status: DNR Region: 6
 Site: NORTH OAKS NATURAL AREA
 Ownership: Private
 Managed Area(s): not managed or no record
 Source: ALMENDINGER, J. C. (CO BIOL SURVEY 1990)
 LARGE STAND OF OAKS ON HILL ESTATE. CANOPY OF EVENLY MIXED QUERCUS ALBA, Q. RUB. Q. MACROCARPA, Q. ELLIP., & APPARENT HYBRIDS. ESSENTIALLY NO REPROD. OF CANOPY TREES, RARE SAPLINGS OF ULMUS RUBRA & PRUNUS SEROTINA. UNDERSTORY PARK-LIKE WITH LOW, DENSE GROWTH OF RUBUS & RIBES. POOR FORB COMPONENT, CONTINUOUS COV. OF MYO-SOTON AG., EUPATORIUM RUG., FLEA, POLYGONUM CONV. AND URTICA. PATCHY COVER OF CAREX PEN. SITE NOTABLE AS EXAMPLE OF EXTREME DEER BROWSE, ENCLOSURES PRESENT.

Minnesota Natural Heritage Database
 Element Occurrence Records
 T30N R22W 06 RAMSEY COUNTY, MN
 Element: OAK FOREST (CENTRAL) DRY SUBTYPE #55
 S Rank: S3
 EO Size: EO Rank: CD Current Status: Intended Status: DNR Region: 6
 Site: NORTH OAKS NATURAL AREA
 Ownership: Private
 Managed Area(s): not managed or no record
 Source: ALMENDINGER, J. C. (CO BIOL SURVEY 1990)
 LARGE STAND OF OAKS ON HILL ESTATE. CANOPY OF EVENLY MIXED QUERCUS ALBA, Q. RUB. Q. MACROCARPA, Q. ELLIP., & APPARENT HYBRIDS. ESSENTIALLY NO REPROD. OF CANOPY TREES, RARE SAPLINGS OF ULMUS RUBRA & PRUNUS SEROTINA. UNDERSTORY PARK-LIKE WITH LOW, DENSE GROWTH OF RUBUS & RIBES. POOR FORB COMPONENT, CONTINUOUS COV. OF MYO-SOTON AG., EUPATORIUM RUG., FLEA, POLYGONUM CONV. AND URTICA. PATCHY COVER OF CAREX PEN. SITE NOTABLE AS EXAMPLE OF EXTREME DEER BROWSE, ENCLOSURES PRESENT.

Minnesota Natural Heritage Database
 Element Occurrence Records
 T30N R22W 06 RAMSEY COUNTY, MN
 Element: OAK FOREST (CENTRAL) DRY SUBTYPE #55
 S Rank: S3
 EO Size: EO Rank: CD Current Status: Intended Status: DNR Region: 6
 Site: NORTH OAKS NATURAL AREA
 Ownership: Private
 Managed Area(s): not managed or no record
 Source: ALMENDINGER, J. C. (CO BIOL SURVEY 1990)
 LARGE STAND OF OAKS ON HILL ESTATE. CANOPY OF EVENLY MIXED QUERCUS ALBA, Q. RUB. Q. MACROCARPA, Q. ELLIP., & APPARENT HYBRIDS. ESSENTIALLY NO REPROD. OF CANOPY TREES, RARE SAPLINGS OF ULMUS RUBRA & PRUNUS SEROTINA. UNDERSTORY PARK-LIKE WITH LOW, DENSE GROWTH OF RUBUS & RIBES. POOR FORB COMPONENT, CONTINUOUS COV. OF MYO-SOTON AG., EUPATORIUM RUG., FLEA, POLYGONUM CONV. AND URTICA. PATCHY COVER OF CAREX PEN. SITE NOTABLE AS EXAMPLE OF EXTREME DEER BROWSE, ENCLOSURES PRESENT.

Minnesota Natural Heritage Database
 Element Occurrence Records
 T30N R22W 06 RAMSEY COUNTY, MN
 Element: OAK FOREST (CENTRAL) DRY SUBTYPE #55
 S Rank: S3
 EO Size: EO Rank: CD Current Status: Intended Status: DNR Region: 6
 Site: NORTH OAKS NATURAL AREA
 Ownership: Private
 Managed Area(s): not managed or no record
 Source: ALMENDINGER, J. C. (CO BIOL SURVEY 1990)
 LARGE STAND OF OAKS ON HILL ESTATE. CANOPY OF EVENLY MIXED QUERCUS ALBA, Q. RUB. Q. MACROCARPA, Q. ELLIP., & APPARENT HYBRIDS. ESSENTIALLY NO REPROD. OF CANOPY TREES, RARE SAPLINGS OF ULMUS RUBRA & PRUNUS SEROTINA. UNDERSTORY PARK-LIKE WITH LOW, DENSE GROWTH OF RUBUS & RIBES. POOR FORB COMPONENT, CONTINUOUS COV. OF MYO-SOTON AG., EUPATORIUM RUG., FLEA, POLYGONUM CONV. AND URTICA. PATCHY COVER OF CAREX PEN. SITE NOTABLE AS EXAMPLE OF EXTREME DEER BROWSE, ENCLOSURES PRESENT.

Minnesota Natural Heritage Database
 Element Occurrence Records
 T30N R22W 06 RAMSEY COUNTY, MN
 Element: OAK FOREST (CENTRAL) DRY SUBTYPE #55
 S Rank: S3
 EO Size: EO Rank: CD Current Status: Intended Status: DNR Region: 6
 Site: NORTH OAKS NATURAL AREA
 Ownership: Private
 Managed Area(s): not managed or no record
 Source: ALMENDINGER, J. C. (CO BIOL SURVEY 1990)
 LARGE STAND OF OAKS ON HILL ESTATE. CANOPY OF EVENLY MIXED QUERCUS ALBA, Q. RUB. Q. MACROCARPA, Q. ELLIP., & APPARENT HYBRIDS. ESSENTIALLY NO REPROD. OF CANOPY TREES, RARE SAPLINGS OF ULMUS RUBRA & PRUNUS SEROTINA. UNDERSTORY PARK-LIKE WITH LOW, DENSE GROWTH OF RUBUS & RIBES. POOR FORB COMPONENT, CONTINUOUS COV. OF MYO-SOTON AG., EUPATORIUM RUG., FLEA, POLYGONUM CONV. AND URTICA. PATCHY COVER OF CAREX PEN. SITE NOTABLE AS EXAMPLE OF EXTREME DEER BROWSE, ENCLOSURES PRESENT.

Minnesota Natural Heritage Database
Element Occurrence Records

T030N R22W SW06 RAMSEY COUNTY, MN

Element: WILLOW SWAMP #3

S Rank: S4

EO Rank:

Site: LONG LAKE WETLANDS

Ownership: Owner unknown

Managed Area(s): not managed or no record

Source: MORLEY, T. (CO BIOL SURVEY 1990)

WILLOW SWAMP WITH SCATTERED SHRUBS AND SMALL TREES. BETULA PUM IS PROBABLY THE MOST COMMON SHRUB. IN GOOD CONDITION. BUCKTHORN IS PRESENT BUT NOT DOMINANT. COMMON PLANTS ARE CORNUS STO, FRAXINUS TEN, POPULUS TRE, SALIX BEB, SALIX DIS, SALIX GRA, ULMUS AME, ALISMA, CALAMAGROSTIS CAN, CAREX SP (STERILE), EUPATORIUM MAC, INPATIENS, OSMUNDA REG, PHALARIS, SAGITTARIA LAT, AND THELYPTERIS. NO LYTHEUM PRESENT.

Last Observed Date: 31 July 1990

DNR Region: 6

Wildlife Area: 610

Forestry District: 611

Quad Map: WHITE BEAR LAKE WEST (R17D)

Latitude: 45 6' 49" Long: 93 6' 0"

Precision: approx. boundaries have been determined

Voucher: Verification: verified

T030N R22W NW08 RAMSEY COUNTY, MN

Element: BUTEO LINEATUS (RED-SHOULDERED HAWK) #54

State Status: SPECIAL CONCERN

EO Rank:

Site: WHITE BEAR 8

Ownership: Owner unknown

Managed Area(s): not managed or no record

Source: BARDON, K. (CO BIOL SURVEY 1990); MOU FILES

1990: BREEDING SEASON OBSERVATION. ONE BIRD RESPONDED TO PLAYBACK. WOODED SWAMP WITH SOME TALL WILLOW, COTTONWOOD, & SMALLER ASPEN. 1991: POSITIVE NESTING. 2 NESTS OBSERVED IN NORTH OAKS AREA, BOTH WITH ADULTS INCUBATING. NESTS VERY CLOSE TO HOUSES. 1993: POSITIVE NESTING. 1 CHICK OBSERVED IN NEST IN WHITE PINE, RESIDENTIAL LOCATION.

Last Observed Date: 14 June 1993

DNR Region: 6

Wildlife Area: 610

Forestry District: 611

Quad Map: WHITE BEAR LAKE WEST (R17D)

Latitude: 45 6' 0" Long: 93 5' 0"

Precision: within 0.25 mile, confirmed

Voucher: Verification: verified

T030N R22W NW08 RAMSEY COUNTY, MN

Element: RICH FEN (TRANSITION) SHRUB SUBTYPE #1

S Rank: S3

EO Rank:

Site: NORTH OAKS NATURAL AREA

Ownership: Private

Managed Area(s): not managed or no record

Source: ALMENDINGER, J.C. (CO BIOL SURVEY 1990)

SHRUB FEN JUST NW OF BLACK LAKE. INTERRUPTED COVER OF BETULA GLAND. W/SCATTERED POPULUS TREM. AND SALIX CF. DISCOLOR. INTERRUPTED COVER OF THELYPTERIS PALUSTRIS WITH SOLIDAGO GIGANTEA, EUPATORIUM MAC., RUBUS PUB., & OSMUNDA REGALIS COMMON. DENSE COVER OF CAREX LEPTALEA ON PEAT SURFACE WITH OCC. CLUMPS OF SCIRPUS CYPER., POA PALUSTRIS, & CALAMAGROSTIS CAN. LOOSE HUMMOCKS OF SPHAGNUM OCCASIONAL. POOLS PH 6.8. NATURAL AND INTACT, EXCEPT FOR HEAVY DEER BROWSING.

Last Observed Date: 01 August 1990

DNR Region: 6

Wildlife Area: 610

Forestry District: 611

Quad Map: WHITE BEAR LAKE WEST (R17D)

Latitude: 45 5' 57" Long: 93 4' 5"

Precision: approx. boundaries have been determined

Voucher: RELIEVE 1990 Verification: verified

T030N R22W SE08SW09 RAMSEY COUNTY, MN

Element: CATTAIL MARSH #2

S Rank: S5

EO Rank:

Site: NORTH OAKS NATURAL AREA

Ownership: Private

Managed Area(s): not managed or no record

Source: ALMENDINGER, J.C. (CO BIOL SURVEY 1990)

CATTAIL (TYPHA ANG. AND T. LAT.) MARSH AROUND BLACK LAKE. CATTAIL COVER GEN. SPARSE WITH DENSE SUBCANOPY OF CALAMAGROSTIS CAN. AND CAREX LACUSTRIS. SOLIDAGO GIGANTEA, EUPATORIUM MAC., AND ASCLEPIAS INCARNATA ARE COMMON FORBS. MARSH FREE OF SHRUBS EXCEPT FOR OCCASIONAL PATCHES OF SALIX GRACILIS. PHALARIS ARUNDINACEA INVADING THE CONTACT WITH UPLANDS.

Last Observed Date: 01 August 1990

DNR Region: 6

Wildlife Area: 610

Forestry District: 611

Quad Map: WHITE BEAR LAKE WEST (R17D)

Latitude: 45 5' 52" Long: 93 3' 56"

Precision: approx. boundaries have been determined

Voucher: Verification: verified

EAST OAKS PLANNED RESIDENTIAL DEVELOPMENT

Minnesota Natural Heritage Database
T30N R22W SECS. 4-6, 8, 9, 16, 17 & T30N R23W Secs. 6, 12- 17:29 Thursday, DECEMBER 11, 1997 4
MnDNR, Natural Heritage and Nongame Research Program Copyright 1997 State of Minnesota DNR

T030N R22W NNE15 RAMSEY COUNTY, MN

Element: EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #761

State Status: THREATENED

EO Size: EO Rank:

Site: WHITE BEAR 15

Ownership: Owner unknown

Managed Area(s): not managed or no record

Source: WORKMAN, M.

1 ADULT TURTLE FOUND ON OTTER LAKE ROAD N OF 9TH ST ABOUT 15 FT S OF RR TRACKS. HAD BROKEN JAW; PROBABLY FROM BEING HIT BY A CAR. TREATED AT WILDLIFE REHAB CLINIC. RELEASED TO POND BY OTTER LAKE RD, N OF 9TH ST ON AUG 31, 1994 (REHAB CLINIC CASE #94-2081).

Last Observed Date: 09 June 1994

DNR Region: 6

Wildlife Area: 610

Intended Status:

Quad Map: WHITE BEAR LAKE WEST (R17D)

Latitude: 45 5' 31" Long: 93 2' 8"

Precision: within 0.25 mile, confirmed

Voucher:

Verification: sight or sound rec.

T030N R22W ON15NE16 RAMSEY COUNTY, MN

Element: DRY PRAIRIE (CENTRAL) SAND-GRAVEL SUBTYPE #6

S Rank: S2

EO Size:

Site: WHITE BEAR 15

Ownership: Owner unknown

Managed Area(s): not managed or no record

Source: ALMENDINGER, J.C. (CO BIOL SURVEY 1990)

SMALL PATCHES OF DRY PRAIRIE OCCUR ON S SIDE OF RAILROAD FROM JUST E OF OTTER LAKE RD. (BEST) AND THEN W TO 35E. INTACT COVER OF STIPA SPARTEA, SHIZ. SCOP., ANDROPOGON GERARDI, AND POA PRAT. NATIVE FORB COMPONENT GOOD IN PLACES, BUT LOTS OF INTRO. WEEDS. GRADES TO WET PRAIRIE NEAR WETLANDS WITH SPARTINA, CALAMAGROST. LIATRIS PYCNO., AND GALIUM BOR.

Last Observed Date: 13 July 1990

DNR Region: 6

Wildlife Area: 610

Intended Status:

Quad Map: WHITE BEAR LAKE WEST (R17D)

Latitude: 45 5' 28" Long: 93 2' 26"

Precision: approx. boundaries have been determined

Voucher:

Verification: verified

T030N R22W NWN17 RAMSEY COUNTY, MN

Element: EMPIDONAX VIRESCENS (ACADIAN FLYCATCHER) #42

State Status: SPECIAL CONCERN

EO Size:

Site: WHITE BEAR 17

Ownership: Owner unknown

Managed Area(s): not managed or no record

Source: BARDON, K. (MOU FILES)

1985: BREEDING SEASON OBSERVATION. BARDON DID NOT SEE BIRD BUT RECOGNIZED ITS DISTINCTIVE CALL. 1992: POSITIVE NESTING. BARDON OBSERVED BIRD ON JULY 21, 23, 28. ALSO OBSERVED BY COUNTY LISTERS. AUG 26 HE SAW ON ADULT FEEDING 3 RECENTLY-FLEDGED, STUB-TAILED YOUNG. 3 CHICKS WERE LINED UP ON BRANCH OF FALLEN OAK. GAPS WERE STILL FLESHY AND PROMINENT, DOWN STILL CLUNG TO PLUMAGE. LAST SEEN AUG 27.

Last Observed Date: 21 July 1992

DNR Region: 6

Wildlife Area: 610

Intended Status:

Quad Map: WHITE BEAR LAKE WEST (R17D)

Latitude: 45 5' 33" Long: 93 4' 27"

Precision: within 0.25 mile, confirmed

Voucher:

Verification: verified

T030N R22W SWNE17 RAMSEY COUNTY, MN

Element: EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #22

State Status: THREATENED

EO Size:

Site: site not named or no record

Ownership: Owner unknown

Managed Area(s): not managed or no record

Source: PETERSON, J. (DNR GREEN SLIP)

1 TURTLE FOUND ALIVE ON ROAD JUST NORTH OF GILFILLAN LAKE. SPECIES FOUND BY LOCA L RESIDENTS AROUND NORTH MALLARD POND FOR PAST 15 YEARS AT LEAST, THOUGH IT IS S CARCE.

Last Observed Date: October 1973

DNR Region: 6

Wildlife Area: 610

Intended Status:

Quad Map: WHITE BEAR LAKE WEST (R17D)

Latitude: 45 5' 18" Long: 93 4' 21"

Precision: within 0.25 mile, confirmed

Voucher:

Verification: sight or sound rec.

EAST OAKS PLANNED RESIDENTIAL DEVELOPMENT

T30N R22W SECS. 4-6, 8, 9, 16, 17 & T30N R23W Secs. 6-12

17:29 Thursday, DECEMBER 11, 1997

5

Minnesota Natural Heritage Database
Element Occurrence Records

MnDNR, Natural Heritage and Nongame Research Program

Copyright 1997 State of Minnesota DNR

T030N R22W SWNW19 RAMSEY COUNTY, MN

Element: ALDER SWAMP #11

S Rank: S5

EO Rank:

Site: SUCKER LAKE NATURAL AREA

Ownership: Owner unknown

Managed Area(s): not managed or no record

Source: MORLEY, T. (CO BIOL SURVEY 1990)

ALDER SWAMP WITH SCATTERED MATURE TAMARACKS (ABUNDANT TAMARACK REPRODUCTION, MOSTLY IN SPONGY AREAS). COMMON SHRUBS ARE ALNUS RUG, BETULA PUM, CORNUS STA, RHUS VER, AND SALIX BEB. COMMON HERBS ARE THELYPTERIS PAL, OSMUNDA REG, EQUISETUM FLU, RUBUS PUB, SOLANUM DOL, AND POA PALUS. DRYOPTERIS CRI, GLYCERIA STR, AND POLYGONUM SAG ARE LESS COMMON. NO PEAT MOSS. RHAMNUS CAT AND RHAMNUS FRA ARE COMMON BUT NOT DOMINANT.

Last Observed Date: 12 July 1990

DNR Region: 6

Wildlife Area: 610

Forestry District: 611

Quad Map: WHITE BEAR LAKE WEST (R17D)

Latitude: 45 4' 22" Long: 93 6' 16"

Precision: approx. boundaries have been determined

Voucher: Verification: verified

T030N R22W SWNW19 RAMSEY COUNTY, MN

Element: ALDER SWAMP #12

S Rank: S5

EO Rank:

Site: SUCKER LAKE NATURAL AREA

Ownership: Regional Park

Managed Area(s): GRASS-VADNAIS (SNAIL LAKE) REGIONAL PARK

Source: MORLEY, T. (CO BIOL SURVEY 1990); MAXSON, G.A. (1980)

DIVERSE ALDER SWAMP W/SCATTERED LARGE TAMARACKS (BUT NO TAMARACK REPRODUCTION). COMMON SHRUBS ARE ALNUS RUG, RHUS VER, SALIX DIS, CORNUS STO, ILEX VER. RHAMNUS FRA, AND R CAT ARE PRESENT BUT NOT DOMINANT. VIBURNUM LEN, QUERCUS MAC, AND POPULUS TRE ALSO PRESENT. HERBS INCLUDE ATHYRIUM, EQUISETUM SYL, E FLU, PHALARIS PHRAGMITES, EUPATORIUM MAC, TYPHA ANG, CALITHA PAL, SAXIFRAGA PEN, SAGITTARIA, & CALLA. G MAXSON DESCRIBED SITE IN 1980 AS CONIFEROUS WETLAND (INVADED BY SALIX).

Last Observed Date: 12 July 1990

DNR Region: 6

Wildlife Area: 610

Forestry District: 611

Quad Map: WHITE BEAR LAKE WEST (R17D)

Latitude: 45 4' 30" Long: 93 6' 15"

Precision: approx. boundaries have been determined

Voucher: Verification: verified

T030N R22W 19 RAMSEY COUNTY, MN

Element: EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #41

State Status: THREATENED

EO Size:

EO Rank:

Current Status:

Site: GRASS-VADNAIS (SNAIL LAKE) REGIONAL PARK

Ownership: Regional Park

Managed Area(s): GRASS-VADNAIS (SNAIL LAKE) REGIONAL PARK

Source: RYSGAARD, G. (DNR GREEN SLIP)

BLANDING'S TURTLE. 0.5 MI N VADNAIS L. LARGE FEMALE CA 9-10 IN.

Last Observed Date: August 1980

DNR Region: 6

Wildlife Area: 610

Forestry District: 611

Quad Map: WHITE BEAR LAKE WEST (R17D)

Latitude: 45 4' 5" Long: 93 5' 55"

Precision: within 0.50 mile

Voucher:

Verification: sight or sound rec.

T030N R22W SW19 RAMSEY COUNTY, MN

Element: RICH FEN (TRANSITION) SEDGE SUBTYPE #3

S Rank: S3

EO Size:

EO Rank:

Site: SUCKER LAKE NATURAL AREA

Ownership: Owner unknown

Managed Area(s): not managed or no record

Source: MORLEY, T. (CO BIOL SURVEY 1990)

GOOD OPEN FEN DOMINATED BY CAREX SPP BUT WITH MANY OTHER HERBS. SHRUBS ARE MOSTLY SMALL & SCATTERED, NO WEEDS PRESENT. VEGETATION MAT QUAKES, WITH MANY HOLES. SHRUBS PRESENT ARE BETULA PUM, CORNUS STO, SALIX GRA, S. BEB, S. PED, & S. CAN. HERBS PRESENT ARE THELYPTERIS PAL, OSMUNDA REG, BRONZUS CIL, CALAMAGROS. CAN, POA PALUS, EUPATORIUM MAC, CAMPANULA APA, IRIS, SOLIDAGO GIG, POTENTILLA PAL, LATHYRUS PAL, ASCLEPIAS INC, SAGITT, SCUTELL, TYPHA, & LYSIMACHIA TER.

Last Observed Date: 12 July 1990

DNR Region: 6

Wildlife Area: 610

Forestry District: 611

Quad Map: WHITE BEAR LAKE WEST (R17D)

Latitude: 45 4' 22" Long: 93 6' 16"

Precision: approx. boundaries have been determined

Voucher:

Verification: verified

EAST OAKS PLANNED RESIDENTIAL DEVELOPMENT

T30N R22W SECS. 4-6, 8, 9, 16, 17 & T30N R23W Secs. 6, 12

17:29 Thursday, DECEMBER 11, 1997

7

Minnesota Natural Heritage Database
Element Occurrence Records

Copyright 1997 State of Minnesota DNR

T030N R22W NWSW22 RAMSEY COUNTY, MN
Element: EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #806
State Status: THREATENED
EO Size: EO Rank: Current Status: Intended Status:
Site: WHITE BEAR 22
Ownership: Owner unknown
Managed Area(s): not managed or no record
Source: DAIL, P. (1997 BLANDING'S TURTLE REPORT)
ONE TURTLE, 8-10 INCHES LONG AND DULL-LOOKING OBSERVED CROSSING OARMEDE LANE, NEAR WHITE BEAR PARKWAY ABOUT 1 1/2 BLOCKS NW OF RESIDENTIAL AREA. TURTLE WAS HEADED SOUTH.

Last Observed Date: 22 June 1997
DNR Region: 6
Wildlife Area: 610
Forestry District: 611

Quad Map: WHITE BEAR LAKE WEST (R17D)
Latitude: 45 4' 3" Long: 93 2' 38"
Precision: within 0.25 mile, confirmed

Voucher: Verification: sight or sound rec.

T030N R23W SWNE01 RAMSEY COUNTY, MN
Element: EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #309
State Status: THREATENED
EO Size: EO Rank: Current Status: Intended Status:
Site: POPLAR LAKE OPEN SPACE
Ownership: County (other lands, including County Open Space lands)
Managed Area(s): POPLAR LAKE OPEN SPACE
Source: SYDA, D. (1988 TURTLE SURVEY)
1 TURTLE FOUND IN BACKYARD. WETLAND LOCATED BEHIND HOUSE.

Last Observed Date: 04 June 1988
DNR Region: 6
Wildlife Area: 610
Forestry District: 611

Quad Map: WHITE BEAR LAKE WEST (R17D)
Latitude: 45 7' 0" Long: 93 6' 55"
Precision: within 0.25 mile, confirmed

Voucher: Verification: sight or sound rec.

T030N R23W SWNE01 RAMSEY COUNTY, MN
Element: EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #807
State Status: THREATENED
EO Size: EO Rank: Current Status: Intended Status:
Site: SHOREVIEW 1
Ownership: Owner unknown
Managed Area(s): not managed or no record
Source: HILFICKER, M. (1997 BLANDING'S TURTLE REPORT)
TURTLE WAS OBSERVED DOWN THE STREET (BIRCH TRAIL) WALKING TOWARDS AREA POND. TURTLE IS 9-9.5 INCHES LONG, SHELL IS SMOOTH, SHINY AND DARK BROWN/BLACK WITH MUCH ALGAE. YELLOW THROAT AND STRIPED BOTTOM.

Last Observed Date: 23 June 1997
DNR Region: 6
Wildlife Area: 610
Forestry District: 611

Quad Map: WHITE BEAR LAKE WEST (R17D)
Latitude: 45 6' 48" Long: 93 7' 20"
Precision: within 0.25 mile, confirmed

Voucher: Verification: sight or sound rec.

T030N R23W NW02 RAMSEY COUNTY, MN
Element: EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #153
State Status: THREATENED
EO Size: EO Rank: Current Status: Intended Status:
Site: SHOREVIEW 2
Ownership: Owner unknown
Managed Area(s): not managed or no record
Source: HASLER, L. (PHOTO RECORD); LINCK, M. (REPORT TO DNR)
TURTLE HATCHLING FOUND AT 5924 CHURCHILL ST. IN ROYAL OAKS ESTATES DEVELOPMENT IN SHOREVIEW. LIVE SPECIMEN BROUGHT TO DNR FOR POSITIVE IDENTIFICATION AND LATER RELEASED. ONE TURTLE HEAD WAS SEEN DURING 1988 BUT LINCK WAS UNABLE TO CAPTURE.

Last Observed Date: 05 June 1988
DNR Region: 6
Wildlife Area: 610
Forestry District: 611

Quad Map: NEW BRIGHTON (R17C)
Latitude: 45 7' 15" Long: 93 8' 39"
Precision: within 0.25 mile, confirmed

Voucher: JFBM-P-27 Verification: photo rec.

Minnesota Natural Heritage Database
Element Occurrence Records

EAST OAKS PLANNED RESIDENTIAL DEVELOPMENT
T30N R22W SECS. 4-6, 8, 9, 16, 17 & T30N R23W
MnDNR, Natural Heritage and Nongame Research Program

17:29 Thursday, DECEMBER 11, 1997
Copyright 1997 State of Minnesota DNR

T030N R23W SENE02 RAMSEY COUNTY, MN

Element: EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #424

State Status: THREATENED

EO Size: EO Rank:

Current Status:

Intended Status:

Ownership: County (other lands, including County Open Space lands)

Managed Area(s): COUNTY DITCH 8 OPEN SPACE

Source: SAX, M. & B. (1996 TURTLE REPORT); LINCK, M. (GREEN SLIP)

1989: 1 GRAVID FEMALE OBSERVED BY M. LINCK ROAD KILLED ON SOUTH SIDE OF CO RD J, APPROX 3/10 MILE WEST OF HODGSON RD (HWY 49) & JUST A FEW FEET WEST OF PHEASANT DR IN SHOREVIEW. CARAPACE >240 MM, >20 ANNULI. 1996: 1 6-8" TURTLE OBSERVED & RELEASED IN 200 ACRE OPEN SPACE AREA NORTH OF TURTLE LAKE. COUNTY IS PLANNING TO REMOVE TREES IN AREA FOR WETLAND MITIGATION.

Last Observed Date: 28 May 1996

DNR Region: 6

Wildlife Area: 610

Forestry District: 611

Quad Map: NEW BRIGHTON (R17C)

Latitude: 45 7' 16" Long: 93 7' 56"

Precision: within 0.25 mile, confirmed

Voucher:

Verification: sight or sound rec.

T030N R23W OSNE05 RAMSEY COUNTY, MN

Element: RICH FEN (TRANSITION) SEDGE SUBTYPE #4

S Rank: S3

EO Size: EO Rank:

Current Status:

Intended Status:

CBS Site #: 54

Site: MOUNDS VIEW SOUTHEAST

Ownership: Owner unknown
Managed Area(s): not managed or no record

Source: MORLEY, T. (CO BIOL SURVEY 1990)

GOOD UNSPOILED RICH FEN, BUT NOT ESPECIALLY DIVERSE. HERBS & SCATTERED SHRUBS IN CENTRAL MEADOW AREA. SPP. PRESENT ARE LYSIMACHIA TER., CAMPANULA APA, EUPATORIUM MAC, POA PALUS, THELYPHERIS PAL, TYPHA LAT, ONOCLEA SEN, SAGITTARIA LAT, SCUTEL-LARIA GAL, RUMEX ORB, CALAMAGROSTIS CAN, POLYGONUM COC OR NAT, GEOM ALEP, SOLID-AGO ALT, S GIG, GLYCERIA STR, SCIRPUS CP CYP, & CAREX ROS. GRADES INTO OUTER RING OF SHRUB WETLAND W/SALIX GRA, CORNUS STO, POPULUS DEL, P. TRE, RUBUS OCC.

Last Observed Date: 15 July 1990

DNR Region: 6

Wildlife Area: 610

Forestry District: 611

Quad Map: NEW BRIGHTON (R17C)

Latitude: 45 7' 2" Long: 93 11' 35"

Precision: approx. boundaries have been determined

Voucher:

Verification: verified

T030N R23W SW14 RAMSEY COUNTY, MN

Element: EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #776

State Status: THREATENED

EO Size: EO Rank:

Current Status:

Intended Status:

Site: SHOREVIEW 14

Ownership: Owner unknown

Managed Area(s): not managed or no record

Source: KUBY, K. (1994 BLANDING'S TURTLE REPORT)

1 TURTLE OBSERVED HEADING EAST AFTER CROSSING LEXINGTON AVE NORTH OF HIGHWAY 96.

Last Observed Date: 28 August 1994

DNR Region: 6

Wildlife Area: 610

Forestry District: 611

Quad Map: NEW BRIGHTON (R17C)

Latitude: 45 4' 48" Long: 93 8' 45"

Precision: within 0.25 mile, confirmed

Voucher:

Verification: sight or sound rec.

T030N R24W 01 ANOKA COUNTY, MN

Element: PITOPHIS CATENIFER (GOPHER SNAKE) #16

State Status: SPECIAL CONCERN

EO Size: EO Rank:

Current Status:

Intended Status:

Site: site not named or no record

Ownership: Owner unknown

Managed Area(s): not managed or no record

Source: BRECKENRIDGE, W.J.

1 SPECIMEN COLLECTED BY LADDIE LAKE.

Last Observed Date: 21 April 1942

DNR Region: 6

Wildlife Area: 610

Forestry District: 611

Quad Map: NEW BRIGHTON (R17C)

Latitude: 45 7' 21" Long: 93 14' 23"

Precision: within one mile

Voucher: JFBM-1160

Verification: verified

EAST OAKS PLANNED RESIDENTIAL DEVELOPMENT
T30N R22W SECS. 4-6,8,9,16,17 & T30N R23W
MnDNR, Natural Heritage and Nongame Research Program

17:29 Thursday, DECEMBER 11, 1997
Copyright 1997 State of Minnesota DNR

Minnesota Natural Heritage Database
Element Occurrence Records

T031N R22W 35 ANOKA COUNTY, MN

Element: EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #28

State Status: THREATENED

EO Size:

EO Rank: EO Rank: not named or no record

Ownership: Private

Managed Area(s): not managed or no record

Source: HAWKINS, A.S. (DNR GREEN SLIP)

BLANDING'S TURTLE. ON ART HAWKINS' FARM.

Current Status: Intended Status:

Last Observed Date: 1978

Quad Map: CENTERVILLE (R17A)

Latitude: 45 7' 50" Long: 93 3' 28"

Precision: within 0.25 mile, confirmed

Voucher:

Verification: sight or sound rec.

DNR Region: 6
Wildlife Area: 601
Forestry District: 611

T031N R22W N35E35 ANOKA COUNTY, MN

Element: EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #567

State Status: THREATENED

EO Size:

EO Rank: EO Rank: not named or no record

Ownership: Owner unknown

Managed Area(s): not managed or no record

Source: MEYER, M.P. (DNR GREEN SLIP)

1 TURTLE OBSERVED WALKING THROUGH ABANDONED GRAVEL PIT AREA BETWEEN FRONTAGE ROAD AND LAKE AMELIA. TURTLE WAS RELEASED INTO POND IN HUGO, MN.

Current Status: Intended Status:

Last Observed Date: 20 June 1991

Quad Map: CENTERVILLE (R17A)

Latitude: 45 7' 43" Long: 93 2' 54"

Precision: within 0.25 mile, confirmed

Voucher:

Verification: sight or sound rec.

DNR Region: 6
Wildlife Area: 601
Forestry District: 611

T031N R23W N35W32 ANOKA COUNTY, MN

Element: EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #284

State Status: THREATENED

EO Size:

EO Rank: EO Rank: not named or no record

Ownership: Owner unknown

Managed Area(s): not managed or no record

Source: KROGER, R. (1988 TURTLE SURVEY)

1 TURTLE FOUND ON ROAD NEAR LADDIE LAKE.

Current Status: Intended Status:

Last Observed Date: 23 May 1988

Quad Map: CIRCLE PINES (R17B)

Latitude: 45 7' 47" Long: 93 14' 28"

Precision: within 0.25 mile, confirmed

Voucher:

Verification: sight or sound rec.

DNR Region: 6
Wildlife Area: 601
Forestry District: 611

RAMSEY COUNTY, MINNESOTA
Minnesota County Biological Survey
DECEMBER 17, 1997

Sitename: NORTH OAKS NATURAL AREA (0 acres)

Site #: 30

Primary Twp: T030N Rng: R22W Section: 05
Legal Description: S5, NE5, W4, E8, T30N R22W

LOWLANDS WITH CATTAIL MARSH, RICH FEN SHRUB SUBTYPE, AND POOR FEN. UPLAND WITH
LARGE TRACT OF MIXED OAK FOREST, SEVERELY OVERBROWSED BY DEER.

SITE STATUS

If Eliminated, Why:
Protection Intentions: no specific recommendations
Protection Importance:
Land Use Comments: DEER ARE OVERBROWSING UPLAND FOREST; NO TREE REPRODUCTION.
Adjacent Land Use Comments (below):

Information Needs (below):

RARE FEATURES

CATTAIL MARSH
Natural Community Rank: S5
Quality: B Date of Information: August 1990

CATTAIL MARSH
Natural Community Rank: S5
Quality: C Date of Information: August 1990

WATERWILLOW (DECODON VERTICILLATUS)
State Legal Status: SPECIAL CONCERN
Quality: AB Date of Information: July 1992

WATERWILLOW (DECODON VERTICILLATUS)
State Legal Status: SPECIAL CONCERN
Quality: BC Date of Information: July 1992

BLANDING'S TURTLE (EMYDOIDEA BLANDINGII)
State Legal Status: THREATENED
Quality: Date of Information: May 1988

OAK FOREST (CENTRAL) DRY SUBTYPE
Natural Community Rank: S3
Quality: CD Date of Information: August 1990

RICH FEN (TRANSITION) SHRUB SUBTYPE
Natural Community Rank: S3
Quality: B Date of Information: August 1990

ADDITIONAL INFORMATION

Site Photos:
Site Maps: Topographic Map; GIS (digital maps);
of Vegetation Plots (Relevés): 1
Plant Data; Bird Data;

RAMSEY COUNTY, MINNESOTA
Minnesota County Biological Survey
DECEMBER 17, 1997

Sitename: LONG LAKE WETLANDS (0 acres)

Site #: 32

Primary Twp: T030N Rng: R22W Section: 06
Legal Description: SW6, T30N R22W; SE1, N12, T30N R23W

CATTAIL MARSH, WILLOW SWAMP AND WET MEADOW IN LOW AREAS, MIXED OAK FOREST ON UPLANDS.

SITE STATUS

If Eliminated, Why:

Protection Intentions: no specific recommendations

Protection Importance:

Land Use Comments: RHAMNUS CATHARTICA HAS DISPLACED NATIVE SHRUBS & MANY HERBS.

Adjacent Land Use Comments (below):

Information Needs (below):

RARE FEATURES

CATTAIL MARSH

Natural Community Rank: S5

Quality: Date of Information: July 1990

WILLOW SWAMP

Natural Community Rank: S4

Quality: Date of Information: July 1990

ADDITIONAL INFORMATION

Site Photos:

Site Maps: Topographic Map; GIS (digital maps);

of Vegetation Plots (Releves): 0

Plant Data;

Natural Heritage Database Print-outs: An Explanation of
Selected Fields

The Natural Heritage database is maintained by the Natural Heritage and Nongame Wildlife Research Program, a unit within the Section of Ecological Services, Department of Natural Resources. It is the most complete source of data on Minnesota's rare, endangered, or otherwise significant plant and animal species, plant communities, and other natural features, and is used in fostering better understanding and protection of these rare features. The information in the database is drawn from many parts of Minnesota, and is constantly being updated, but it is not based on a comprehensive survey of the state. Therefore, there are currently many significant natural features present in the state which are not represented by the database. We are in the process of addressing this problem via the Minnesota County Biological Survey, a county-by-county inventory of rare natural features, which is now underway.

Please note that the print-outs are copyrighted and cannot be reproduced without permission.

Index

The Natural Heritage database maintains records of rare features, or "elements" in Minnesota. The records contain many fields which can be organized into variously formatted printouts. Each line in an abbreviated print-out, or index, represents one occurrence of a rare natural feature such as an endangered plant or animal, a native plant community, or a significant geological feature. Your index is organized by township, range and section and includes the following fields:

TWP, RNG, SECTION: Township, range and section numbers. Records have varying degrees of precision; some are listed only to the nearest section or sections, others are listed to the nearest 40 acres (e.g., SWNW32 means the SW1/4 of the NW1/4 of section 32). "0" is used as a place holder when a 1/2 section is specified (e.g., ON03-north 1/2 of section 3). When a community overlaps section boundaries, both sections will be listed in the section field without punctuation (e.g., NE19NW20=NE1/4 of section 19 and NW1/4 of section 20).

FED STATUS: Status of species under the Federal Endangered Species Law. Codes are LE=endangered, LT=threatened, C=species which are candidates for listing due to sufficient information on biological vulnerability and threat(s), but which have not yet been officially designated as endangered or threatened.

MN STATUS: Minnesota legal status of plant and animal species under the State Endangered Species Law. Codes for status are as follows: END=endangered, THR=threatened, SPC=special concern. Additional species are tracked that have no legal status, but they are rare and may become listed if they decline further; the code for these is NON. This field is blank for natural communities and colonial waterbird nesting sites, which have no legal status in Minnesota, but are tracked by the database.

S RANK: The S (state) Rank assigned to natural community types is intended to reflect the known extent and condition of the natural communities in Minnesota. Community types are ranked on a scale from 1 to 5; those ranked "1" are considered in greatest need of conservation action in the state, while community types ranked "5" are considered secure under present conditions. A "?" following a rank (e.g. "S2?") is used in cases where only limited information is available on the community. Communities for which information is especially scarce are given a "U", for rank undetermined. The ranks do not represent a legal status. They are used by the Minnesota Department of Natural Resources to set priorities for research, inventory and conservation planning. The state ranks are periodically updated as inventory information becomes available.

ELEMENT AND OCCURRENCE NUMBER: For plant and animal species this is the scientific name with the common name in parentheses; for all other features it is the feature name. The occurrence number, in combination with the element name, uniquely identifies each record and may be used to retrieve additional information from the full-record printout.

MANAGED AREA: If the element occurs within the boundaries of an area managed by a public agency or a conservation organization such as The Nature Conservancy, the name of the area is recorded. If this field is blank, the element probably occurs on private land. If "(STATUTORY BOUNDARY)" occurs after the name of a managed area, the location is usually a private inholding within the statutory boundary of a state forest or state park. For many large managed areas such as national forests and most state forests, ownership information is often unknown.

Full Record Printout (compressed version)

Some users of Natural Heritage database information are interested in more detailed information about the individual occurrences of rare features than is provided by the index. The full record printout (compressed version) is designed to include additional fields from the database that are likely to be most relevant to users.

In full record printouts that are organized geographically, the first line of each record contains the legal description of the location, including the county. The legal description field contains the township, range and section numbers. Records have varying degrees of precision; some are listed only to the nearest section or sections, others are listed to the nearest 40 acres (e.g., SWNW32 means the SW1/4 of the NW1/4 of section 32). "0" is used as a place holder when a 1/2 section is specified (e.g., ON03=north 1/2 of section 3). When a community overlaps section boundaries, both sections will be listed in the section field without

Natural Heritage database printouts (continued)

3

punctuation (e.g., NE19NW20=NE1/4 of section 19 and NW1/4 of section 20).

The second line shows the element name ("ename"), the common name for plants and animals, and the occurrence number. Other fields are defined below.

LAST OBSERVED DATE: The date of the most recent information about this record.

DNR REGION: References the 6 DNR regions in the state.

STATE STATUS: Minnesota legal status of plant and animal species under the State Endangered Species Law. Status categories include Endangered, Threatened, Special Concern and No Legal Status (rare but not listed in the state). This field is blank for natural communities and colonial waterbird nesting sites, which have no legal status in Minnesota, but are tracked by the database.

FEDERAL STATUS: This field appears only for plant or animal species that have legal status under the federal Endangered Species Law - Endangered, Threatened, and Candidate.

S RANK: The S (state) Rank assigned to natural community types is intended to reflect the known extent and condition of the natural communities in Minnesota. Community types are ranked on a scale from 1 to 5; those ranked "1" are considered in greatest need of conservation action in the state, while community types ranked "5" are considered secure under present conditions. A "?" following a rank (e.g. "S2?") is used in cases where only limited information is available on the community. Communities for which information is especially scarce are given a "U", for rank undetermined. The ranks do not represent a legal status. They are used by the Minnesota Department of Natural Resources to set priorities for research, inventory and conservation planning. The state ranks are periodically updated as inventory information becomes available.

WILDLIFE AREA: The Section of Wildlife administrative number.

EO SIZE: The size in acres (often estimated) of natural communities.

EO RANK: An evaluation of the quality and condition of natural communities from A (highest) to D (lowest).

CURRENT STATUS: Present protection status of a site from 0 (owner is not aware of record) to 9 (dedication as a Scientific and Natural Area).

Natural Heritage database printouts (continued)

4

INTENDED STATUS: Desired protection status. If a complete list of protection status codes is needed, please contact the Natural Heritage Program.

QUAD MAP: The U.S. Geologic topographic maps maintained by the Heritage Program.

FORESTRY DISTRICT: The Division of Forestry's district number.

SITE: The sitename allows the database to group occurrences that are located near each other. Usually this name refers to a county biological survey site; in other instances it is the name of a managed area, sometimes it is a more generic name that encompasses several managed areas and/or private land (e.g., sitename Felton Prairie pulls together occurrences on Felton Prairie SNA, Felton WMA and private lands), occasionally it is a colloquial name (Katinanta Bog); often it is a township name and section number.

CBS SITE #: A number assigned to each county biological survey site. In each county, the numbering system begins with the number 1.

LATITUDE/LONGITUDE: The lat-long references the dots which are placed manually on the quad map files. There are various levels of precision in the original information, but this is not reflected in the lat-long data. For some of the data, particularly historical records, it was not possible to determine exactly where the original observation was made. Examples of this type of locational information would be "Fort Snelling", or "the south shore of Lake Owasso". During the manual mapping process for the least precise observations, the dot is placed in the center of the 7.5 minute quad map, and the lat-long coordinates are determined for the center of the dot. In cases where the occurrence is known within a quarter mile, the lat-long reflects the nearly exact location of the record.

OWNERSHIP: Indicates whether the site is privately owned; for publicly owned land the agency with management responsibility is listed here.

PRECISION: This field indicates how precise the locational information is. There are six levels of precision: 1) occurrence is known within 1/4 mile radius (most precise level), 2) occurrence is known within 1/2 mile radius (usually within a section), 3) occurrence is known within one mile radius, 4) occurrence is known to exist within the quad map or general region, 5) occurrence is unappable (often known only to the county level), 6) occurrence no longer exists at former location.

MANAGED AREA(S): These are lands owned or managed by either a public agency or a private conservation organization such as The Nature Conservancy. If "(STATUTORY BOUNDARY)" occurs after the name of a managed

Natural Heritage database printouts (continued)

5

area, the location is usually a private inholding within the statutory boundary of a state forest or state park. For many large managed areas such as national forests and most state forests, ownership information is often unknown.

SOURCE: The collector or observer of the feature.

VOUCHER: The museum or herbarium where specimens are maintained and the accession number assigned by the repository. In the case of bald eagles, this is the breeding area number.

VERIFICATION: This, in general, reflects the reliability of information. In the case of old plant collections, the date of the collection determines whether the record is verified or unverified; collections before 1970 are unverified. The highest level of reliability is "verified" which usually indicates a collection was made or, as in the case of bird records, nesting was observed.

REMARKS AT END OF RECORDS: The last 1-3 lines of each record contain more detailed notes about the occurrence, such as the number of individuals, descriptive information about habitat, associated species, etc.

Data Security

The locations of some rare features must be treated as sensitive information because widespread knowledge of these locations could result in harm to the rare features. The most sensitive information is the locations of species of wildflowers, including orchids, endangered species such as the Dwarf trout lily, and economically valuable plants such as Ginseng, because these are vulnerable to exploitation by collectors. Bald eagles are sensitive to disturbance during the breeding season from curious on-lookers. For this reason, information from the Natural Heritage database should not be reproduced or published without permission from the Natural Heritage Program. We are concerned that any publication for public distribution not identify the precise locations of the vulnerable plant species referred to above. One way to handle this would be to list only the sections in which the sensitive species occur. If this is not acceptable for your purposes, please call and discuss this issue with the Environmental Review Specialist for the Heritage and Nongame Research Program at 612/296-8279.

Another issue is the disturbance or eradication of a rare feature by development projects. If a threat to any of the features on your printout comes to your attention, please call the Environmental Review Specialist for the Heritage and Nongame Research Program.

Natural Heritage database printouts (continued)

6

Data Requests.

The Heritage Database is updated continuously. Of particular significance is the body of new records being generated by the Minnesota County Biological Survey. For this reason, it is important to forward data requests to the Natural Heritage and Nongame Wildlife Research Program. In addition, printouts can be organized by the data management staff to meet the particular needs of requesters. Requests for rare features data should be forwarded to Mary Miller at 612/296-8319 or Ellen Heneghan at 612/296-8279.

APPENDIX D

Conservancy Land Management Plan

North Oaks Company Conservancy Land Management Plan

Executive Summary

The North Oaks Company (the Company) will dedicate an area of land (the Conservancy Land) to be preserved and reasonably maintained to protect its inherent natural characteristics and unique biological elements. The management of the Conservancy Land, as defined in other related documents, will be intentionally restrictive yet broad enough to establish and maintain appropriate stewardship objectives to enhance the existing wildlife as well as promote the sustainability of the natural environment into the future.

The purpose of this Management Plan is to set forth the intent, policies and practices to be used in the future management of the Conservancy Land. This Management Plan will be recited in a Conservation Easement affecting the Conservancy Land, to be conveyed to the Minnesota Land Trust (the Trust), which Conservation Easement will be executed concurrently with this Plan, and this Plan will be used by the Company or its assignee (the Owner) and the Trust in future situations affecting the Conservancy Land, to determine whether the intent of the parties in the Conservation Easement is being upheld.

History

This land was part of one of the earliest experimental farms in Minnesota. In 1883, James J. Hill (1838-1916), who served on President Theodore Roosevelt's Conservation Committee in 1908, purchased the original 3000 acres of traditional farmland from Charles D. Gilfillan. During Mr. Hill's lifetime he used this land for experiments in intensive animal husbandry as well as to study divergent types of feed and fertilizers. His own farming background gave him an appreciation for "wise use" conservation and "proper utilization of the soil". This farm became his family's favorite recreational residence and also provided ample opportunity for experimentation in the diversification of agriculture through genetic research and crop development. From 1883 through 1893 it was operated as a stock farm and a base for his breeding efforts with cattle, pigs, poultry, turkeys, sheep, elk, deer and horses. In addition, the farm's greenhouses were used to grow the Hill family's vegetables, eggs, milk, fruit and fresh flowers, which were sent daily to his residences in either St. Paul, Minnesota, or California. Mr. Hill and his wife were both buried on their farm.

Over the years, the Hill family has retained ownership of the farm and increased its size. Two generations of children were raised there. In 1950, Louis W. Hill, Jr. created the Company and included 2500 acres of the farm in its inventory. He engaged a landscape architect to design a world class golf course and set a plan for its future development as a residential community. This plan has been in place for 47 years and now includes 1256 homes set among the beautiful natural surroundings of the Hill farm. The farming activities were moved to the east part of the farm and a substantial program of Yorkshire Pig breeding was carried out from 1954 through 1969. In addition, several hundred acres were farmed with hay and legume crops. This farming activity continues today.

In 1996, Doug and Mari Hill Harpur (great granddaughter of James J. Hill) purchased the remaining 1200 acres of the farm from her father's estate and also acquired the Company. During this period the farm has continued to be used for research, sometimes in connection with the University of Minnesota and sometimes with the Department of Natural Resources. Although breeding operations have declined, farming activities and land/water restoration projects continue. Sixteen tree nurseries have been established on the farm and Company property, and a concentrated effort has been made to regenerate organic matter and soil fertility in the remaining pastures.

Description of Existing Conditions

The Conservancy Land consists of approximately 620 acres of land including upland areas of mixed hardwood forest with forest openings as well as lakebed, lakeshore and wetland areas. The entire City of North Oaks is currently designated as a State Game Refuge, in which no hunting, fishing or trapping by the public are allowed.

In further detail, the Conservancy Land currently includes the following features:

Tree Nursery: There is an existing tree nursery approximately six acres in size within the Conservancy Land. This nursery is located on the west side of Wilkinson Lake. The entire nursery is enclosed with an eight foot wire mesh fence. The nursery contains a great variety of trees and shrubs. Some of the stock will be relocated to other areas in the City of North Oaks, some will be allowed to remain and reach maturity. Mowing and tree trimming will continue to be conducted throughout portions of this nursery.

Enclosures: There are several fenced enclosures throughout the Conservancy Land. These enclosures are meant to keep the resident deer herd from damaging the trees contained within the enclosures. Some of the enclosures will be removed at staff's discretion and others will be maintained as is indefinitely. Staff will retain the right to erect and dismantle enclosures as staff deems necessary.

Wilkinson Lake Control Structure/Fish Barrier: The outlet to Wilkinson Lake contains a control structure with a built in fish barrier. The stainless steel and cement structure is approximately 84 feet in length and 15 feet in width. There are 25 foot wing walls on either side of the structure on the Wilkinson Lake end of the structure. The structure contains eight adjustable weirs. The entire exposed portion of the structure has a steel grate observation deck with fenced rail perimeter.

The primary purpose of the structure is to stabilize the water levels in Wilkinson Lake and prevent rough fish from entering the lake. This in turn provides for better habitat for waterfowl and other wildlife and plant life in the Wilkinson Lake basin. Water levels are manipulated to enhance the overall productivity of the basin. Staff retains the right to manipulate water levels for the improvement of habitat conditions, subject to federal, state or local regulations.

Wilkinson Well: There is an old well located just north of the outlet to Wilkinson Lake. The St. Paul Water Utility maintains this well and plans to cap it in 1998.

Gates: There are five gates in the Conservancy Land. These gates have been used to restrict access to the Conservancy Land and other property owned by the Company. The Owner retains the right to maintain these gates as well as erect others as conditions warrant.

Roads and Trails: The Conservancy Land contains several forest management roads and walking trails. These roads and trails are shown on the map attached to this Plan as Exhibit E1A. The forest management roads are integral to maintaining the health of the forest. These roads will continue to be maintained and used by the Owner when necessary to perform management activities.

Fences: There are currently many areas that are fenced to keep people from walking through restricted areas. Most of these fences are beside the gates and help prevent trespassers from simply walking around the gates. There are also many old livestock fences scattered throughout the Conservancy Land. These fences may be removed or left standing by the Owner, at the Owner's discretion.

Culverts: Many culverts exist throughout the Conservancy Land. The Owner retains the right to maintain these as well as to add others where they deem necessary, as allowed or required by local ordinances regarding water quality, drainage, etc.

St. Paul Water Utility: The St. Paul Water Utility has the right to enter the Conservancy Land to monitor the water quality and flow rate, as well as to conduct maintenance activities deemed necessary to improve the water supply for which it is responsible. The Water Utility shall retain all rights it possesses at the time the Conservation Easement is executed.

Wilkinson Lake: Wilkinson Lake is currently being maintained at an approximate water level of 894.0 USGS. This provides the basin with an average depth of 2 - 3 feet. The open water portion of the lake is home to many aquatic plants (see Exhibit E1B for list of plant and animal species found on the Conservancy Land). This is rimmed by a dense stand of cattails. The cattail is often floating and parts of it move around the lake with the wind. Reed canary grass is also prevalent throughout the fringe areas.

Wilkinson Lake is used by 22 species of waterfowl during spring and fall migrations. Great blue heron, great egret, belted kingfisher and green backed heron are common residents throughout the spring, summer and fall. Summer waterfowl include mallard, hooded merganser, wood duck and blue winged teal.

Water willow (*Decodon verticulatus*), a species of special concern in MN, is present on the lake in small amounts.

Overall Habitat Condition:

Most wetland areas, although appearing to be relatively untouched, have been manipulated at some point in the past. There are several wetlands that show some signs of ditching. Reed canary grass is prevalent throughout the wetland and fringe areas. There are several Type 6 wetlands present. Most of these contain willow, dogwood and alder species.

The vast majority of upland areas in the Conservancy Land consist of mature oak forest with an undergrowth of common buckthorn. Green ash, basswood and birch are also common in isolated areas. In areas where sunlight can penetrate the canopy, remnants of big bluestem can be found.

Oak wilt is present throughout the Conservancy Land. The Company currently monitors this situation and uses recommended control practices such as trenching and cutting.

Due to overbrowsing by the resident deer herd and past management practices, much of the ground under the canopy is very bare. Very little regeneration is occurring. The most prevalent forb growth is white snakeroot (*Ageratina altissima*).

Goals and Objectives for the Conservancy Land

The purpose in establishing this Conservancy Land is to protect certain conservation values and to maintain the area as an educational and research resource for future generations, within the confines of a coherent management plan. Limited access by private invitees will be integral to the success of the purposes of this Plan. Use, restoration and preservation of the area will be governed by a practical compromise between protecting the historical resources of the property with its environmental and ecological characteristics, and allowing for extensive renovations to restore the health of the forest, animal and plant populations, stream corridors, etc. Existing uses of the area will be allowed to continue. Scenic vistas and viewshed enhancements are an important objective. Overall, there will be great attention given to balancing disturbances (both human and natural) with the land's natural integrity. Given this approach and the intended perpetual nature of this and related documents, management methods will be constantly evaluated as to their effectiveness, and new technologies and methods will be considered for their relative usefulness as time goes on. This is clearly in keeping with the history of the research and experimental nature of the land's use since Mr. Hill first purchased it more than a century ago.

This plan is permissive. It sets out activities which the Owner is entitled, without obligation, to pursue. It does not impose financial obligations on the Owner, except to the extent that restoration is required as a result of specific activities of the Owner that are contrary to the intent of this plan and the related Conservation Easement.

Specific activities to accomplish these goals may include the following:

Restoration:

1. Use legal means to control or eliminate obnoxious weeds and non-native species of plants, such as European buckthorn, purple loosestrife, etc. To prevent subsequent deterioration of restored sites, plants native to the Conservancy Lands may be introduced to such sites.
2. Use controlled burning, approved chemicals, etc., for purposes of restoring native ecosystems on sites appropriate for same.

3. Alter waterways, wetlands and lakeshore for the purpose of enhancing wildlife habitat, nesting cover for birds, water habitat for native fish, etc., including the use of heavy equipment, chain saws, etc., to create or change existing conditions.

Maintenance:

1. Cut wood and remove timber as part of a forest management program.
2. Construct and maintain roads and trails for access to wildlife areas, recreation areas, vistas etc.
3. Alter and/or maintain waterways to maintain a navigable canoe route for recreation purposes as well as to protect stream corridors for water quality and wildlife habitat purposes.
4. Construct and maintain parking facilities for access to trailheads and other approved uses.
5. Construct and maintain shelters along trails and observation platforms at points of interest or scenic overlooks.
6. Place nesting structures for wildlife, such as wood duck boxes, goose platforms, duck nesting structures, bluebird houses and bat houses.
7. Place signs throughout area for instructional, identification and directional purposes.
8. Install gates and/or signage to manage access.
9. Activities to maintain oak savanna and other forest-related maintenance, including controlling deer herd and other wildlife or plant populations that threaten native or desired species.

Research:

It is the Owner's intention to continue its present research activities and expand on these activities throughout the Conservancy Land. Research will be conducted by Owner's staff or outside research groups that have been approved by Owner's staff. It is our intention to allow the community as well as other respected researchers to become involved in studying and understanding the natural communities and amenities which this Conservancy Land has to offer.

The research activities that will take place will include but not be limited to the following:

Bird Banding:

Trapping birds through the use of mist nets and banding them with approved USFWS bands. These activities can take place all year round with the most active periods being spring and fall. Bird "lanes" will be maintained for the mist nets to be placed in. This will require some tree and shrub trimming as well as mowing of undergrowth.

Censusing:

Both flora and fauna will be inventoried throughout the Conservancy Land. These inventories will be conducted primarily by foot traffic; however, enclosures and traps of various types may be used for inventory and research purposes.

Canopy Study:

A canopy study is foreseen in the future on this Conservancy Land. In order to accomplish this, some substantial structures may be placed in this area to gain access to the canopy to be studied. Large equipment may also be required to install these structures.

Wetland Research:

The Conservancy Land contains significant wetland resources. Wetlands are presently a hot topic of study and there has been much interest in these wetland areas. Invertebrate sampling, water quality and plant diversity are areas of research that may be conducted. These activities will be allowed as well as the necessary equipment that goes with these studies.

All other research which the Owner deems valid, will be able to be carried out as long as these activities do not pose a significant risk to goals and objectives of the Conservation Easement.

Monitoring and Enforcement of Conservation Easement for Conservancy Land

The monitoring and enforcement duties associated with the Conservation Easement shall be carried out by representatives of the Minnesota Land Trust according to the terms of the Conservation Easement. This Management Plan shall be used as baseline documentation of the Conservancy Land at the time the Conservation Easement is executed and referenced in future monitoring and enforcement visits and actions by the Trust.

Conclusion

This Management Plan cannot anticipate every possible situation or impact on the Conservancy Land in perpetuity. It is intended as a guide and indication of the overall intent of the parties as to general goals and objectives. Common sense and reason should prevail in addressing new or unforeseen problems, and to allow for the incorporation of the latest technology and knowledge about the relevant areas of biology affecting the Conservancy Land.

Amendments to portions of this Plan may become necessary as time passes, to accommodate changed conditions, practices or scientific advancements that would better address the intended purposes and uses of the Conservancy Land.

Executed to identify this as the Conservancy Land Management Plan referenced in the Conservation Easement of _____, _____ 1998 with respect to approximately 620 acres of Conservancy Land.

North Oaks Company LLC

Minnesota Land Trust

By _____

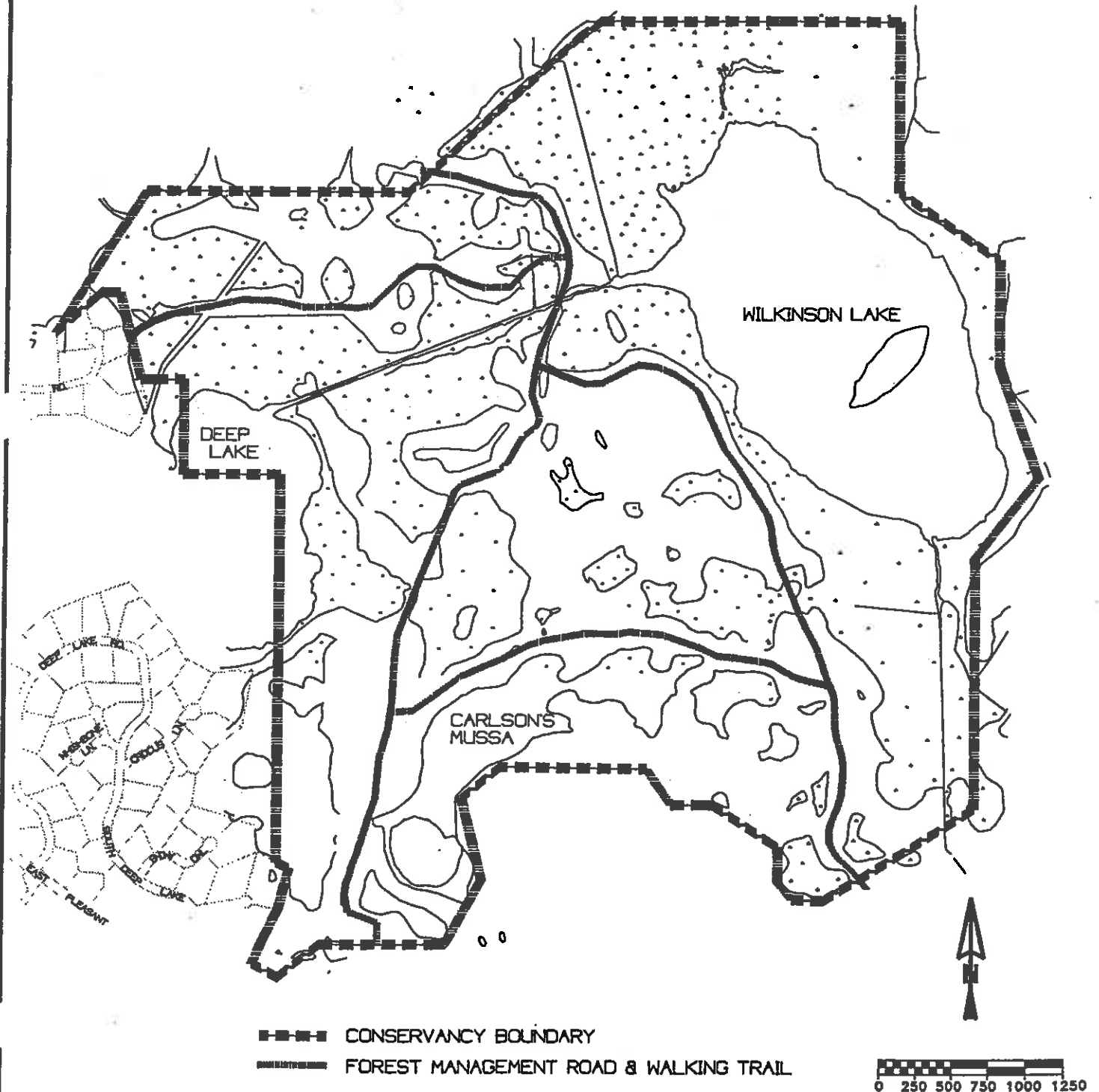
By _____

Its _____

Its _____

EXHIBIT E1A

FOREST MANAGEMENT ROADS AND WALKING TRAILS



APPENDIX E
Wetland Banking Credit Balance
Correspondence

VADNAIS LAKE AREA WATER MANAGEMENT ORGANIZATION

4701 Highway 61
White Bear Lake, Minnesota 55110-3277
Phone: (612) 429-8522

MEMBERS

Gem Lake
Lino Lakes
North Oaks
St. Paul Water Utility
Town of White Bear
Vadnais Heights
White Bear Lake

July 22, 1996

Mr. Richard Leonard
North Oaks Company
One Pleasant Lake Road
North Oaks, MN 55127

Re: Hill Farm site on Centerville Road, White Bear Township / Banking Credits for North Oaks Company

Dear Mr. Leonard:

CENTERVILLE ROAD PROPERTY.

Thank you for your on going cooperation regarding the Centerville Road exemption request.

Tom Petersen and myself met with your consultant Gary Eagles on site July 2, 1996. The information supplied has been reviewed. We would like to meet with you to discuss the findings, recommendations, and review the options at your earliest convenience.

STATUS OF BANKING CREDITS

New Wetland Credit

The full Technical Evaluation Panel (TEP), Barbara Ohman, Tom Petersen, and Stephanie McNamara did a final review (7/17/96) of the banking sites at Rapp Farm and Andersonville Slough to verify eligibility of those areas for "New Wetland Credit" (NWC) in the State Wetland Bank. This site visit was preceded by a preliminary visit earlier this spring and a survey of the area delineated as newly created wetland. Your consultant, Bob Fashingbauer is submitting the final results, survey and report on this NWC. The expectation is that the Andersonville Slough effort will yield about 0.1 acre and Rapp Farm will yield about 0.4 acre of NWC for a total of 0.5 acre. As soon as VLAWMO has received the final survey with accurate acreage amounts we will process the 'Request to Deposit' form and other required paperwork. We will advise you when these credits are available for withdrawal.

Public Value Credit

Raising the water level in Andersonville Slough and Rapp Farm also restored some of the previously drained hydrology of the wetlands. Andersonville Slough was changed from a type 6 to a type 3/6. Rapp Farm was change from type 1 to type 3. The law allows for this type change with increased hydrology to qualify for Public Value Credit (PVC) in the State Wetland Bank. The "Request to Deposit" for this was submitted 8/25/95. Deed Recording materials and other paperwork were also submitted. Our metro conservationist

for the Minnesota Board of Soil and Water Resources (BWSR) has assured me that all the paperwork and approvals are in order. The North Oaks Company should have 5.1 acres of PVC that may be used or sold at their discretion. Those acres may be subdivided as you see fit. If you wish to put a value on square feet and sell some of your credit in that manner, state rules do not place any restrictions on your subdividing the credit.

At this time VLAWMO has no policy limiting the geographic use of this state PVC or NWC. The wetland will, of course, remain within VLAWMO. Any purchaser would only purchase the credit from you. It is my understanding also that as this is a Minnesota state wetland bank, the credits it holds have no standing outside of the state.

Just to note what we have discussed before, PVC may be used as mitigation in different ways than NWC. Wetland losses due to human draining or filling around the state require mitigation unless exempted. As you know, in this area the replacement ratio is 2:1. NWC may be used for the first half (1:1) or second half of the mitigation requirements in a replacement plan. PVC may be used for mitigation credit in a replacement plan only after the 1:1 ratio of new wetland or new wetland credit has been met. This gives NWC greater flexibility in its use than PVC.

If you have any questions on banking please feel free to call or write.

In the mean time, I will call to set a time to meet again on the Centerville Road property as soon as possible. We look forward to your continued cooperation as we resolve the wetland questions for this property.

Yours very truly,



Stephanie McNamara
Administrative Secretary / Wetland Consultant

c Jim Johnston, VLAWMO Chair
Bob Fashingbauer, PEC
Gary Eagles, PEC
VLAWMO Board

APPENDIX F

State Historic Preservation Office

Correspondence



MINNESOTA HISTORICAL SOCIETY
STATE HISTORIC PRESERVATION OFFICE

July 17, 1998

Mr. Gary Eagles
North Oaks Company LLC
One Pleasant Lake Road
North Oaks, MN 55127

Re: New Construction; Residential Development - East Oaks
North Oaks, Ramsey County
SHPO Number: 98-1074

Dear Mr. Eagles:

Thank you for the opportunity to review and comment on the above project. It has been reviewed pursuant to the responsibilities given the Minnesota Historical Society by the Minnesota Historic Sites Act and the Minnesota Field Archaeology Act.

We have reviewed the results of the survey of the project area. We do not feel that the two archaeological find spots identified by the survey are significant. Further, we conclude that the probability of any other properties being located in the area of potential effect is low.

Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36CFR800, procedures of the Advisory Council on Historic Preservation for the protection of historic properties. If this project is considered for federal assistance, it should be submitted to our office with reference to the assisting federal agency.

Please contact Dennis Gimmestad at 612-296-5462 if you have any questions on our review of this project.

Sincerely,

Britta L. Bloomberg
Deputy State Historic Preservation Officer

cc: Teresa Halloran, Loucks and Associates
Kathryn Fernholz, Westwood Professional Services



MINNESOTA HISTORICAL SOCIETY

January 14, 1998

Ms. Kathryn Fernholz
Westwood Professional Services, Inc.
7599 Anagram Drive
Eden Prairie, MN 55344

RE: REF No. 97426
East Oaks Residential Developoment
North Oaks, Ramsey County
SHPO Number: 98-1074

Dear Ms. Fernholz:

Thank you for consulting with our office during the preparation of an Environmental Assessment Worksheet for the above referenced project.

We believe that there is a high probability that unreported archaeological properties may be present in the project area. Therefore, we recommend that a survey of the area be completed. The survey must meet the requirements of the Secretary of the Interior's Standards for Identification and Evaluation, and should include an evaluation of National Register eligibility for any properties which are identified. For your information, we have enclosed a list of consultants who have expressed an interest in undertaking such surveys.

If the project area can be documented as previously disturbed or previously surveyed, we will re-evaluate the need for survey. Previously disturbed areas are those where the naturally occurring post-glacial soils and sediments have been recently removed. Any previous survey work must meet contemporary standards.

Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36CFR800, procedures of the Advisory Council on Historic Preservation for the protection of historic properties. If this project is considered for federal assistance, or requires a federal license or permit, it should be submitted to our office with reference to the appropriate federal agency.

If you have any questions on our review of this project, please contact me at 62-296-5462.

Sincerely,

Dennis A. Gimmetstad
Government Programs and Compliance Officer

Enclosure: List of Consultants

