ENVIRONMENTAL ASSESSMENT WORKSHEET

Black Dog Amphitheater
Proposed by Rose Wild L.L.C.

Preparer: City of Burnsville

May 8, 2000

ENVIRONMENTAL ASSESSMENT WORKSHEET

Note to preparers: This form is available at www.mnplan.state.mn.us. *EAW Guidelines* will be available in Spring 1999 at the web site. The Environmental Assessment Worksheet provides information about a project that may have the potential for significant environmental effects. The EAW is prepared by the Responsible Governmental Unit or its agents to determine whether an Environmental Impact Statement should be prepared. The project proposer must supply any reasonably accessible data for -- but should not complete -- the final worksheet. If a complete answer does not fit in the space allotted, attach additional sheets as necessary. The complete question as well as the answer must be included if the EAW is prepared electronically.

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. **Project title:** Black Dog Amphitheater

2. **Proposer:** Rose Wild L.L.C.
   Contact person: Martha Fuller
   Title: C.F.O.
   Address: 444 Cedar St. Suite 900
   City, state, ZIP: St. Paul, MN 55101
   Phone: 651-602-6021
   Fax: 651-222-1055
   E-mail: mfuller@wild.com

3. **RGU:** City of Burnsville
   Contact person: John Shardlow
   Title: Planning Consultant
   Address: 100 Civic Center Parkway
   City, state, ZIP: Burnsville, MN 55337
   Phone: 612-339-3300
   Fax: 612-337-5601
   E-mail: john.shardlow@ci.burnsville.mn.us

4. **Reason for EAW preparation** (check one).
   ____EIS scoping __X__Mandatory EAW ___Citizen petition ___RGU discretion ____Proposer volunteered

   If EAW or EIS is mandatory give EQB rule category subpart number and subpart name

   4100.4300 Subpart 34 Sports or entertainment facilities

5. **Project Location.**
   County: Dakota
   City/Township: Burnsville
   All of the southeast ¼ of the south half of Section 28, the south ½ of the southwest ¼ of Section 28, part of the south ½ of the northeast ¼ of Section 28, Township 27 N, Range 24 W

   Attach each of the following to the EAW:
   - County map showing the general location of the project;
   - U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable);
   - Site plan showing all significant project and natural features.
   - Vicinity Map

   (See Section 5)

6. **Description.**

   a. Provide a project summary of 50 words or less to be published in the *EQB Monitor*.

   The proposed Black Dog Amphitheater is an outdoor music and entertainment venue. It will seat 19,500 persons, with approximately 7,200 seats under a roof structure and 12,300 lawn seats. The project site is west of I-35W, south of the Minnesota River, in the City of Burnsville, Dakota County, Minnesota.

b. Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of existing structures. Indicate the timing and duration of construction activities.

(See Section 6)

c. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

(See Section 6)

d. Are future stages of this development including development on any outlots planned or likely to happen?
__Yes _X_No
If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

The previous PUD approval anticipated the development of a marina as phase three of this development. At this point, the landowner and applicants have indicated that the area previously reserved for the marina will now be part of a wetland restoration effort.

e. Is this project a subsequent stage of an earlier project? _X_Yes __No
If yes, briefly describe the past development, timeline and any past environmental review.

This project is the second phase of a Planned Unit Development reviewed and approved in 1990. The first phase included the Hennepin County Trash Transfer Station adjacent to I35, which has been built.

7. **Project magnitude data.**

Total project acreage: 159.9 acres

Number of residential units:
Unattached: None
Attached: None
Maximum units per building: None

Commercial, industrial or institutional building area (gross floor space): N/A
Indicate areas of specific uses (in square feet):

Office: N/A	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: Height of roof structure - If over 2 stories, compare to heights of nearby buildings

(See Section 7)

8. **Permits and approvals required.** List all known local, state and federal permits, approvals and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure.

(See Section 8)

9. **Land use.** Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

(See Section 9)

10. **Cover types.** Estimate the acreage of the site with each of the following cover types before and after development:

(See Section 10)

11. **Fish, wildlife and ecologically sensitive resources.**
a. Identify fish and wildlife resources and habitats on or near the site and describe how they would be affected by the project. Describe any measures to be taken to minimize or avoid impacts.

(See Section 11)

b. Are any state-listed (endangered, threatened or special concern) species, rare plant communities or other sensitive ecological resources such as native prairie habitat, colonial waterbird nesting colonies or regionally rare plant communities on or near the site?
__Yes _X_No

If yes, describe the resource and how it would be affected by the project. Indicate if a site survey of the resources has been conducted and describe the results. If the DNR Natural Heritage and Nongame Research program has been contacted give the correspondence reference number: .
Describe measures to minimize or avoid adverse impacts.

12. **Physical impacts on water resources.** Will the project involve the physical or hydrologic alteration -- dredging, filling, stream diversion, outfall structure, diking, and impoundment -- of any surface waters such as a lake, pond, wetland, stream or drainage ditch? _X_Yes __No
If yes, identify water resource affected and give the DNR Protected Waters Inventory number(s) if the water resources affected are on the PWI.
Describe alternatives considered and proposed mitigation measures to minimize impacts.

(See Section 12)

13. **Water use.** Will the project involve installation or abandonment of any water wells, connection to or changes in any public water supply or appropriation of any ground or surface water (including dewatering)?
__Yes _X_No
If yes, as applicable, give location and purpose of any new wells; public supply affected, changes to be made, and water quantities to be used; the source, duration, quantity and purpose of any appropriations; and unique well numbers and DNR appropriation permit numbers, if known. Identify any existing and new wells on the site map. If there are no wells known on site, explain methodology used to determine.

(See Section 13)

14. **Water-related land use management district.** Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? _X_Yes __No
If yes, identify the district and discuss project compatibility with district land use restrictions.

(See Section 14)

15. **Water surface use.** Will the project change the number or type of watercraft on any water body?
__Yes _X_No
If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other uses.

16. **Erosion and sedimentation.** Give the acreage to be graded or excavated and the cubic yards of soil to be moved.
Describe any steep slopes or highly erodible soils and identify them on the site map. Describe any erosion and sedimentation control measures to be used during and after project construction.

(See Section 16)

17. **Water quality: surface water runoff.**
a. Compare the quantity and quality of site runoff before and after the project. Describe permanent controls to manage or treat runoff. Describe any stormwater pollution prevention plans.

(See Section 17)

b. Identify routes and receiving water bodies for runoff from the site; include major downstream water bodies as well as the immediate receiving waters. Estimate impact runoff on the quality of receiving waters.

(See Section 17)

18. **Water quality: wastewaters.**
a. Describe sources, composition and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.

(See Section 18)

b. Describe waste treatment methods or pollution prevention efforts and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies, and estimate the discharge impact on the quality of receiving waters. If the project involves on-site sewage systems, discuss the suitability of site conditions for such systems.

(See Section 18)

c. If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pretreatment provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying any improvements necessary.

(See Section 18)

d. If the project requires disposal of liquid animal manure, describe disposal technique and location and discuss capacity to handle the volume and composition of manure. Identify any improvements necessary. Describe any required setbacks for land disposal systems.

(See Section 18)

19. **Geologic hazards and soil conditions.**
Approximate depth (in feet)
To ground water: 3ft. minimum, 27 ft. average
To bedrock: 3 ft. minimum, 27 ft. average

Describe any of the following geologic site hazards to ground water and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due to any of these hazards.

(See Section 19)

b. Describe the soils on the site, giving NRCS (SCS) classifications, if known. Discuss soil granularity and potential for groundwater contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.

(See Section 19)

20. Solid wastes, hazardous wastes, storage tanks.
a. Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.

(See Section 20)

b. Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating groundwater. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.

(See Section 20)

c. Indicate the number, location, size and use of any above or below ground tanks to store petroleum products or other materials, except water. Describe any emergency response containment plans.

(See Section 20)

21. Traffic.
Parking spaces added: 6,300.
Existing spaces (if project involves expansion): 0 .
Estimated total daily traffic generated: 11,560 vehicles (design event) or 13,930 vehicles (maximum).
Estimated maximum peak hour traffic generated (if known) and time of occurrence: (See Section 21).

Provide an estimate of the impact on traffic congestion on affected roads and describe any traffic improvements necessary. If the project is within the Twin Cities metropolitan area, discuss its impact on the regional transportation system.

(See Section 21)

22. Vehicle-related air emissions. Estimate 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. Note: If the project involves 500 or more parking spaces, consult *EAW Guidelines* about whether a detailed air quality analysis is needed.

(See Section 22)

23. Stationary source air emissions. Describe the type, sources, quantities and compositions of any emissions from stationary sources of air emissions such as boilers, exhaust stacks or fugitive dust sources. Include any

hazardous air pollutants (consult *EAW Guidelines* for a listing) and any greenhouse gases (such as carbon dioxide, methane, nitrous oxide) and ozone-depleting chemicals (chloro-fluorocarbons, hydrofluorocarbons, perfluorocarbons or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.

(See Section 23)

24. **Odors, noise and dust.** Will the project generate odors, noise or dust during construction or during operation?
X Yes __No
If yes, describe sources, characteristics, duration, quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify locations of nearby sensitive receptors and estimate impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

(See Section 24)

25. **Nearby resources.** Are any of the following resources on or in proximity to the site?
Archaeological, historical or architectural resources? __Yes X No
Prime or unique farmlands or land within an agricultural preserve? __Yes X No
Designated parks, recreation areas or trails? X Yes __No
Scenic views and vistas? __Yes X No
Other unique resources? X Yes __No
If yes, describe the resource and identify any project-related impacts on the resource. Describe any measures to minimize or avoid adverse impacts.

(See Section 25)

26. **Visual impacts.** Will the project create adverse visual impacts during construction or operation? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks? __Yes X No
If yes, explain.

27. **Compatibility with plans and land use regulations.** Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency?
X Yes __No. If yes, describe the plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain.

(See Section 27)

28. **Impact on infrastructure and public services.** Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project? X Yes __No. If yes, describe the new or additional infrastructure or services needed. (Note: any infrastructure that is a connected action with respect to the project must be assessed in the EAW; see *EAW Guidelines* for details.)

(See Section 28)

29. **Cumulative impacts.** Minnesota Rule part 4410.1700, subpart 7, item B requires that the RGU consider the "cumulative potential effects of related or anticipated future projects" when determining the need for an environmental impact statement. Identify any past, present or reasonably foreseeable future projects that may interact with the project described in this EAW in such a way as to cause cumulative impacts. Describe the nature of the cumulative impacts and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to cumulative impacts *(or discuss each cumulative impact under appropriate item(s) elsewhere on this form).*

30. **Other potential environmental impacts.** If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

(See Section 30)

31. **Summary of issues.** *Do not complete this section 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 begun. 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.

(See Section 31)

RGU CERTIFICATION. The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public 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.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9b and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature John W. Shaulk Date 5/8/00

Title Planning Consultant

Environmental Assessment Worksheet was prepared by the staff of the Environmental Quality Board at Minnesota Planning. For additional information, worksheets or for *EAW Guidelines*, contact: Environmental Quality Board, 658 Cedar St., St. Paul, MN 55155, 651-296-8253, or www.mnplan.state.mn.us

1. **Project Name:**

Black Dog Amphitheater

2. Proposer

Rose Wild L.L.C.

Contact Person: Martha Fuller, C.F.O.

444 Cedar Street
Suite 900
St. Paul, Minnesota 55101
651-602-6021 (phone)
651-222-1055 (fax)
mfuller@wild.com

3. **Responsible Governmental Unit:**

City of Burnsville

Contact Person: John Shardlow, Planning Consultant
City of Burnsville
100 Civic Center Parkway
Burnsville, MN 55337
612-339-3300
612-337-5601
john.shardlow@ci.burnsville.mn.us

4. Reason for EAW Preparation

Mandatory Category Rule Number 4100.4300 Subpart 34 – Sports or Entertainment Facilities

The project involves the construction of an outdoor music and arts entertainment amphitheater with a peak attendance of 19,500 persons and an average attendance of about 8,000 persons.

5. Project Location

City of Burnsville, Dakota County, Minnesota

All of the southeast ¼ of the south half of Section 28, the south ½ of the southwest ¼ of Section 28, part of the south ½ of the northeast ¼ of Section 28, Township 27 N, Range 24 W

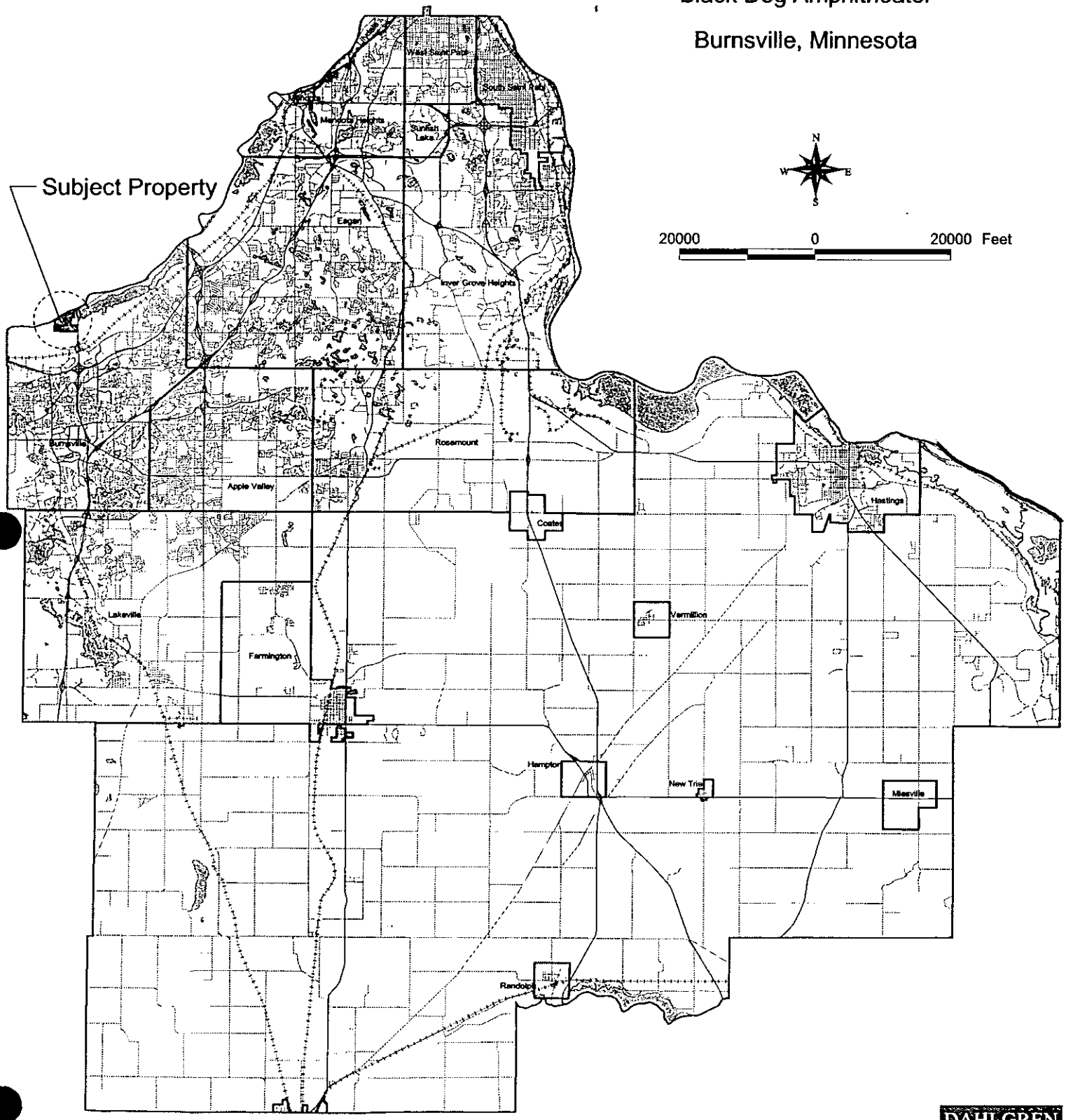
Attached Documents:

- County Map showing the general location of the project
- USGS 7.5 minute, 1:24,000 scale map indicated project boundaries
- Site plan showing all significant project features.
- Vicinity Map

County Map with Project Location

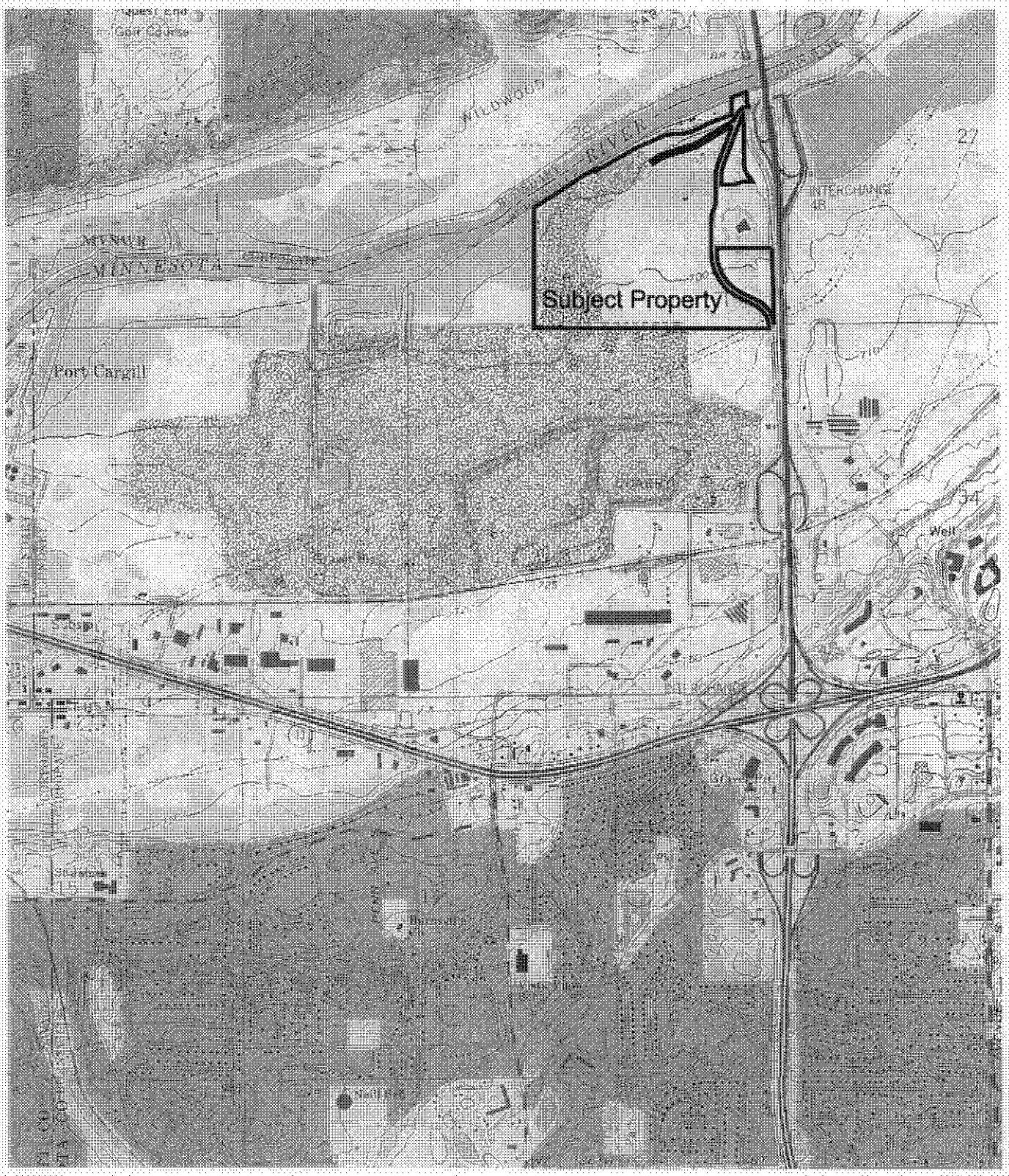
Black Dog Amphitheater

Burnsville, Minnesota



DAHLGREN SHARDLOW AND UBAN

May 1, 2000



USGS Map with Project Location

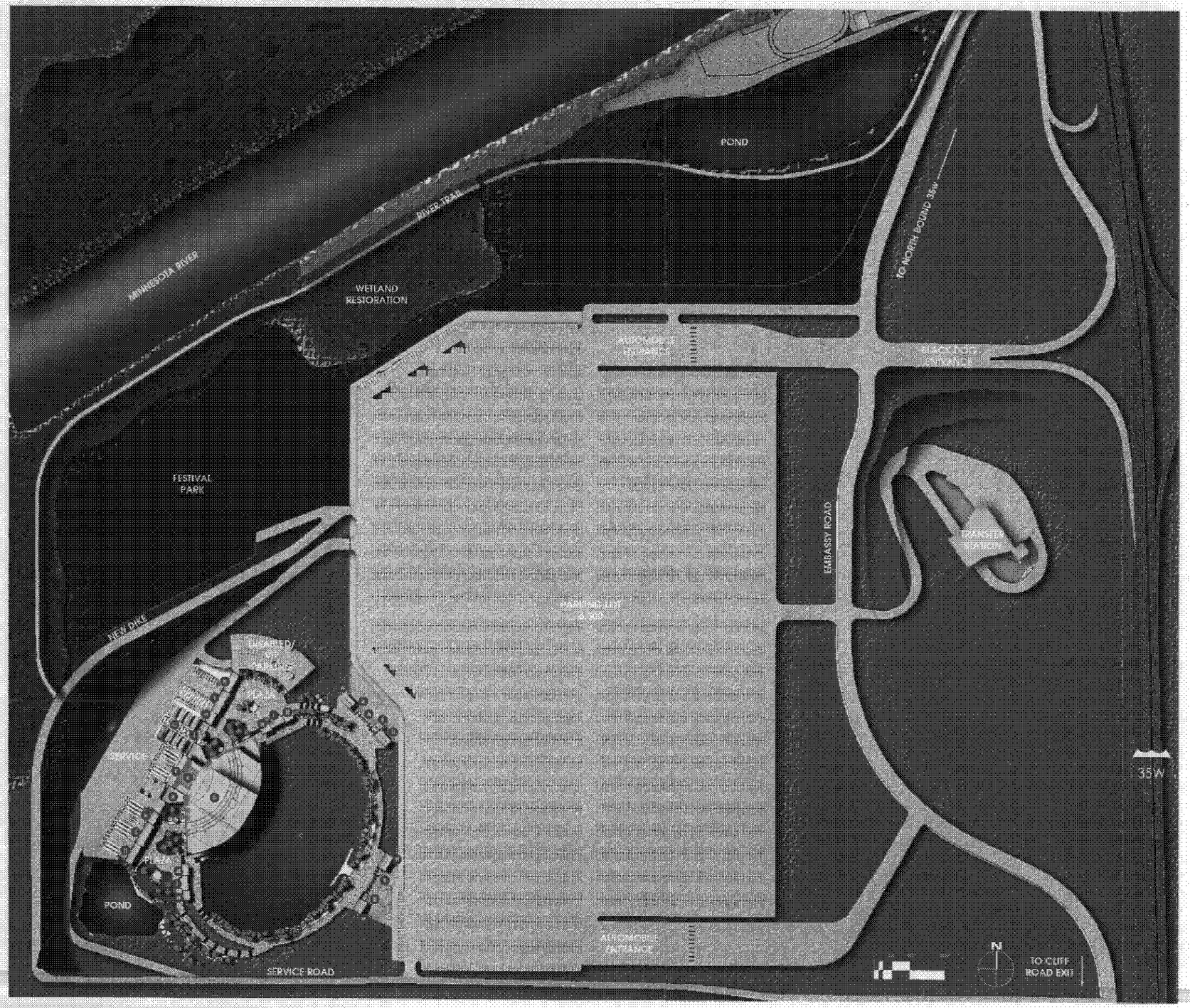
Black Dog Amphitheater

Burnsville, Minnesota

May 1, 2000

2000 0 2000 Feet

DAHLGREN SHARDLOW AND UBAN



SITE PLAN

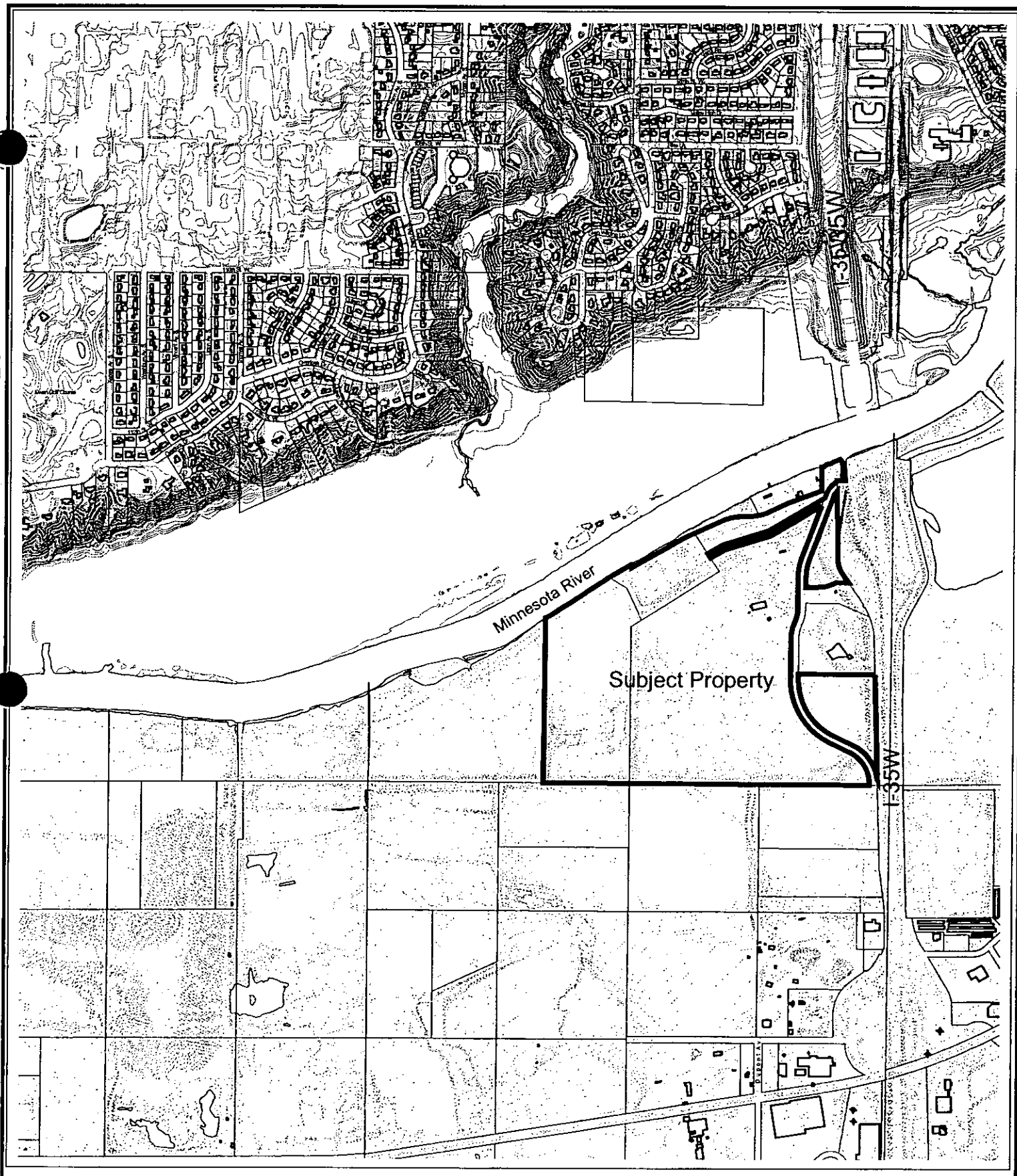
KEY

A MAIN ENTRANCE
B TICKET BOOTH
C GRADE BEAM (ELEVATION = 12.000
D FIXED SEATING (~7,000
E STAGE
F LOADING DOCK
G SUPPORTING AREAS
H CONCESSIONS/RESTROOMS
I FOOD, BEVERAGE, SOUVENIRS
J MEMORABILIA
K ACRISS MEMORIAL/ART ARC

APRIL 21, 1995

BLACK DOG AMPHITHEATER
BURNSVILLE, MINNESOTA

DEVELOPER: ROSE WILD, L.L.C.
ARCHITECTS: BOARMAN KROON PLINTER VOGEL & ASSOCIATES



Project Vicinity Map

Black Dog Amphitheater
Burnsville, Minnesota

N

0.25 0 0.25 Miles

DAHLGREN SHARDLOW AND UBAN

May 1, 2000

6. Description

a. Provide a project summary of 50 words or less to be published in the EQB Monitor:

The proposed Black Dog Amphitheater is an outdoor music and entertainment venue. It will contain seating for 19,500 persons, with approximately 7,200 seats under a canopy structure and 12,300 lawn seats. The project site is west of I-35, south of the Minnesota River, in the City of Burnsville, Dakota County, Minnesota.

b. Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of existing structures. Indicate the timing and duration of construction activities.

The proposed development is a Planned Unit Development (PUD) consisting of an outdoor entertainment amphitheater (the Amphitheater). The site contains a total of 159.9 acres and is located adjacent to the Minnesota River, to the west of Interstate 35W in northern Burnsville.

The Amphitheater is being designed to accommodate a maximum seating capacity of 19,500, with 7,200 seats under a canopy structure and the remainder accommodated on a sloped grass area. The season of use for the Amphitheater is mid-May to mid-September. Normal operating hours will be from 8:00 p.m. to 11:00 p.m., with the majority of events anticipated to occur on weekend evenings. The amphitheater is expected to host between 25-35 performance events per season, with an estimate of performance frequency and attendance in an average season as follows:

- 4 to 6 events would be less than 10,000 patrons in attendance
- 18 to 22 events would be from 10,000 to 15,000
- 4to 6 events would be from 15,000 to 19,500

The amphitheater is projected to open partially in the Summer 2001 concert season.

The subject property is owned by R. B. McGowan Company and has been the site of a sanitary landfill and a limestone quarry. Approximately 140 acres of the property is a permitted sanitary landfill known as the Freeway Landfill, permit number SW-050. The landfill operated from 1969 to 1990. The landfill was added to the National Priority List (NPL) by the U.S. EPA in

1986 following discovery of ground water contamination. Sites added to the NPL are also referred to as superfund sites. The landfill has remained on the NPL to date. Under authority of State Statute 115B.39, MPCA will negotiate a binding agreement (BA) with the landfill owner, R. B. McGowan Company, and proceed with design, construction, and operation of a new landfill cover and active gas extraction system. Following completion of construction, MPCA will seek from U.S. EPA removal of the Freeway Landfill from the NPL, as this construction will encompass an adequate remediation of the site.

A significant quantity of waste previously landfilled in the flood plain near the north central portion of the property will be excavated and placed on higher elevations of the landfill. This work will be done to both remove the waste from the flood plain to reduce contact of water with the waste, and to provide fill in the upper portions of the waste pile for the purposes of finishing the upper portion of the landfill cover as a parking lot for amphitheater patrons. This waste relocation would be performed whether or not the amphitheater was being developed. The waste excavation will likely take place during winter months when the level of the Minnesota River is seasonally low. Most of the excavated area will be backfilled to the current elevation with clean soil. A portion of the excavated area will be used to construct a sedimentation basin to capture surface water collected from the finished landfill cover to allow settlement of sediment in the runoff water prior to discharge to the river. This runoff water will not contain landfill leachate or be in contact with landfill waste.

Another portion of the site that is currently landfill will be used to construct a new freeway interchange for Interstate 35W and Embassy Road. For economic and liability reasons, waste from this area will be excavated and backfilled with clean structural fill. The excavated waste will also be relocated on top of the existing pile to build adequate grades for the parking lot. Relocation of this waste would not occur if the interchange did not need to be built.

A geomembrane (continuous plastic sheet) will be installed down to bedrock along the west boundary of the landfill adjacent to the amphitheater grass seating. The purpose of installing the geomembrane is to 1.) reduce the potential to draw contaminated groundwater from under the landfill if and when a dewatering system is installed near the McGowan quarry to keep the amphitheater from filling up with ground water once the Kraemer Quarry dewatering system is terminated, 2.) to reduce the potential that atmospheric oxygen will be drawn into the waste from the west if the vacuum applied by the landfill active gas extraction system is too great, as buried waste can begin to spontaneously combust if too much oxygen is introduced, and 3.) to reduce the potential that landfill gas could migrate to the amphitheater

seating area causing unnecessary health risks to amphitheater patrons. Installation of this geomembrane would not be necessary if development of the amphitheater did not occur.

The southern boundary of the landfill may also have additional waste excavated and relocated on to the main waste mass. This area will be used as an underground utility corridor for water supply and wastewater force main. In addition, a utility road for conveyance of heavy support vehicles to the amphitheater will be constructed off landfill cover, as the weight of these vehicles could cause possible damage to the geomembrane barrier layer. Relocation of most of the waste along the southern boundary would not occur if the amphitheater was not developed

c. Explain the purpose of the project; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The purpose of the project is to provide a venue for outdoor music and entertainment. The project will not be carried out by a governmental unit; it will be carried out by Rose Wild L.L.C., a joint venture of the National Hockey League's Minnesota Wild hockey team and local event promoter Rand Levy of Rose Presents.

d. Are future stages of this development including development on any outlots planned or likely to happen? __Yes _X_No

The previous PUD approval anticipated the development of a marina as phase three of this development. At this point, the area previously reserved for the marina will be part of a wetland restoration area. Any future plans for a marina would require an amendment to the PUD and would be subject to additional environmental review.

e. Is this project a subsequent stage of an earlier project? _X_Yes __No

The McGowan PUD approved in the early 1990s included the Hennepin County Trash Transfer Station as its first phase. The transfer station was included within the Environmental Impact Statement prepared by Hennepin County and focused on trash transfer station locations. The transfer station in Burnsville was built in 1990.

7. Project Magnitude Data:

Total Project Acreage: 159.9

Number of residential units
Unattached: None
Attached: None
Maximum units per building N/A

Commercial, industrial or institutional building area (gross floor space): N/A*

Office: N/A
Retail: N/A
Warehouse: N/A
Light Industrial: N/A
Other Commercial (specify): N/A

Manufacturing: N/A
Other Industrial: N/A
Institutional: N/A
Agricultural: N/A

Building Height (if over 2 stories, compare to heights of nearby buildings):

It is important to describe height calculations for the Amphitheater roof structure in relationship to base elevation calculations. The Amphitheater roof structure is stepped. The maximum height of the roof, measured from the bottom of the quarry, is 60 ft.; the bottom of the quarry is at a base elevation of 670 ft. and the top of the highest roof is at an elevation of 730 ft. The height of the roof at each of its sides is 48 ft.; the sides of the roof are at an elevation of 718 ft.

The stage is proposed at an elevation of 677 ft. The highest point of the back of berm seating is proposed at an elevation of 732 ft., with another 10 ft. high sound berm beyond the seating at an elevation of 734 ft. at its highest point, and then slopes downward in a horseshoe shape.

As part of this Environmental Assessment Worksheet, measurements were made to determine the distance between the proposed amphitheater and the closest residential structure and lot line across the Minnesota River in the City of Bloomington, as well as three other receptor sites (see Section 24 for more detailed information and a map of noise receptor locations):

- Receptor No. 1, Overlook Circle, Bloomington: distance from stage = 4,250 ft.; street elevation = 820 ft.; house grade elevation = 828 ft.
- Receptor No. 2, Vista Circle, Burnsville: distance from stage = 7,150 ft.; street elevation = 920 ft.
- Receptor No. 3, Black Dog Park Entrance: distance from stage = 6,450 ft.; grade elevation = 724 ft.
- Receptor No. 3A, Meadow Brook Village, Burnsville: distance from stage = 8,950 ft.; grade elevation = 874 ft.

There is one other structure adjacent to the site, being the Trash Transfer Station. The center of the Trash Transfer Station is located 2,550 feet from the center of the amphitheater stage. Its roof height reaches a similar elevation as the Amphitheater roof.

* The amphitheater and dike would cover approximately 40-45 acres. Parking areas would cover about 55 acres.

8. List all known local, state, and federal permits/approvals/funding required:

List all known local, state and federal permits, approvals and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure.

FEDERAL	TYPE OF PERMIT/APPROVAL	STATUS
FHWA	Access Revision Request Approval	Future
U.S. Army Corps of Engineers	Section 10 Permit Work in Public Waters: Storm Sewer Outlet	Future
U.S. Army Corps of Engineers	Riprap on Riverbank to Protect Dike	Future
U.S. Army Corps of Engineers	Section 404 Construction on Portion of Protected Wetland, Amphitheater, Interchange Modification, and Embassy Road access from the south	Future
U.S. Army Corps of Engineers	Section 404 Construction on Portion of Protected Wetland, Interchange Modification	Previously Approved, but to be included in overall project permit
STATE	TYPE OF PERMIT/APPROVAL	STATUS
MnDOT	Approval of Interchange Geometric Design	Pending
MnDOT	Project Memorandum I-35W/Black Dog Road Interchange Modifications	Future
MnDOT	Construction Permit for I-35W/Black Dog Road Interchange Modifications	Future
MnDNR	Review Permit for Development in the Floodplain	Future
MPCA	Indirect Source Permit	Future
MPCA	Closure Plan Landfill Area	In Process
MPCA	Development Agreement – Amphitheater	In Process

MPCA	NPDES permits for construction Activities and Stormwater Discharge	Future
MPCA	Section 401 Water Quality (Construction Permit)	Future
MPCA	Proposer can apply for a noise variance if acoustical analyses show a violation of the MPCA noise rules	
REGIONAL	TYPE OF PERMIT/APPROVAL	STATUS
Metropolitan Council	Approval of Revision of Highway Interchange Ramp	Approved
Lower Minnesota River Watershed District	Review Grading and Erosion Control Plans	Future
COUNTY	TYPE OF PERMIT/APPROVAL	STATUS
Dakota County	Approval of Local Street Improvements Affecting County Highway System	Future
Dakota County Soils and Water Conservation District	Review and Comment on Grading and Erosion Control Plans	Future
LOCAL	TYPE OF PERMIT/APPROVAL	STATUS
City of Burnsville	Development Stage Approval (PUD)	Future
City of Burnsville	Conditional Use Permit for Pending Construction in Floodway (Incorporated in PUD Review)	Future
City of Burnsville	Grading Permit	Future
City of Burnsville	Buildings Permits	Future
City of Burnsville	Occupancy Permits	Future
City of Burnsville	Wetland Conservation Act	Future

(as LGU/RGU)	impact to wetlands, amphitheater	
City of Burnsville (as LGU/RGU)	Wetland Conservation Act issue concerning impact to wetlands, Interchange Modifications	Pending

PUBLIC FINANCIAL ASSISTANCE

Rose Wild LLC will pay the costs related to the design and construction of the Black Dog Amphitheater. The State, using dollars from the Solid Waste Fund, will pay the design and construction costs associated with the closing of the Freeway Landfill. This includes designing and constructing the landfill cover to accommodate development of a parking lot for the amphitheater and relocating waste for the proposed freeway interchange. The incremental costs associated for this development will be paid back to the State from the Rose Wild and/or City of Burnsville. In addition, the City of Burnsville will be responsible for the maintenance of the parking lot and the sedimentation basins. The City of Burnsville's role in the public/private partnership will be to provide the infrastructure improvements necessary to accommodate the amphitheater. These improvements include improved freeway interchanges for access off I-35W at Black Dog Road and Cliff Road, an improved Cliff Road, which will extend westerly and southerly to T.H. 13, and the extension of a new, improved Embassy Road, as a minor arterial roadway connecting south to Cliff Road. All of these roadway projects will include utility adjustments and stormwater improvements. The construction will be completed in accordance with a National Pollutant Discharge Elimination System (NPDES) General Permit for storm water discharge as issued by the Minnesota Pollution Control Agency.

The City of Burnsville will be using Tax Increment Financing funds for some of these improvements, along with MSA funds, assessments, utility funds and other potential sources generated from the Project Area. The tax increment financing plan for amphitheater related improvements has been submitted to Dakota County and Independent School District 191. In February 2000, the City of Burnsville held a public hearing regarding the TIF plan.

9. Land Use.

Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

The vast area located west of I-35W and north of the Chicago & North Western Railroad tracks has been dominated by two land uses for more than thirty years: sanitary landfills and limestone quarries. The R.B. McGowan property has been the site of the Freeway Landfill, which is proposed for closure and removal from the superfund list. Limestone has been mined from the western portion of the property, adjacent to the Minnesota River, and this is the location of the proposed amphitheater facility.

The Minnesota River flows on the north side of the site. This is a Minnesota "protected water" and federal "water of the U.S.," classified as a navigation channel. Any encroachment or work (such as riprap) below the Ordinary High Water Level would require both MNDR and USCOE permits (see additional comments in Section 12). The land immediately west of the amphitheater site and its dike is floodplain, forest and wetland. In accordance with the City Comprehensive Plan and the Planned Unit Development agreement covering this parcel – owned by Edward Kraemer and Sons – the land will remain in floodplain forest condition in perpetuity, buffering the amphitheater site.
Immediately to the south of the McGowan property is the several hundred acre quarry that is owned and operated by Edward Kraemer & Sons. Another major sanitary landfill is located to the west of the Kraemer quarry and is owned and operated by U.S. Waste. U.S. Salt controls a 7.2-acre parcel to the north and east of the McGowan land. This site is approved for the storage and transshipment of road deicing salt.

A number of commercial and industrial businesses are located to the south of the Edward Kraemer land, including Rudy Luther's Burnsville Volkswagen, Knox Lumber, and the Yellow Freight Truck Terminal. These businesses are located far enough away from the proposed development so that they will not likely be affected by it, except as the new local street improvements and the subsequent movement of amphitheater related traffic is concerned.

After an extensive review of the documents and correspondence related to the closure of the Freeway landfill, the City of Burnsville has reached the conclusion that the environmental issues surrounding this matter will have been adequately addressed when the required binding agreement is completed and the amphitheater

development plan is completed and accepted by the MPCA. The City supports the continued work, by both the landowner and the MPCA, toward the resolution of the issues that remain to be agreed upon in order to complete this important process. Questions within this worksheet that address issues covered by either the binding agreement or the development agreement are answered in a summary format. Persons requesting more information should contact the Burnsville Planning Department.

10. Cover Types

Estimate the acreage of the site with each of the following cover types before and after development.

Types 1-8 wetlands	Lawn/Landscaping
Wood/Forest	Impervious Surfaces
Brush/Grassland	Other (Describe)
Cropland	

BEFORE DEVELOPMENT

Because of the nature of the historic use of the McGowan Property, it is not hard to understand that it cannot be readily summarized in typical acreage categories. The Brush/Grassland category is by far the largest acreage in the existing condition, but it is important to recognize that this is the covered portion of the landfill. In many places the landfilled area remains sparsely vegetated. There is such a negligible amount of impervious surface in the current condition that this has simply been added into the Landfill category. The Quarry category is self-explanatory.

The acreage below is as listed on the attached original property plat for each lot or outlot within the development area of the amphitheater (see Figure 10.1). (The underlying plat will change as part of the proposed development and is shown here for reference purposes). The acreage for the adjacent Trash Transfer Station and the small Outlot A is excluded from the overall new development area.

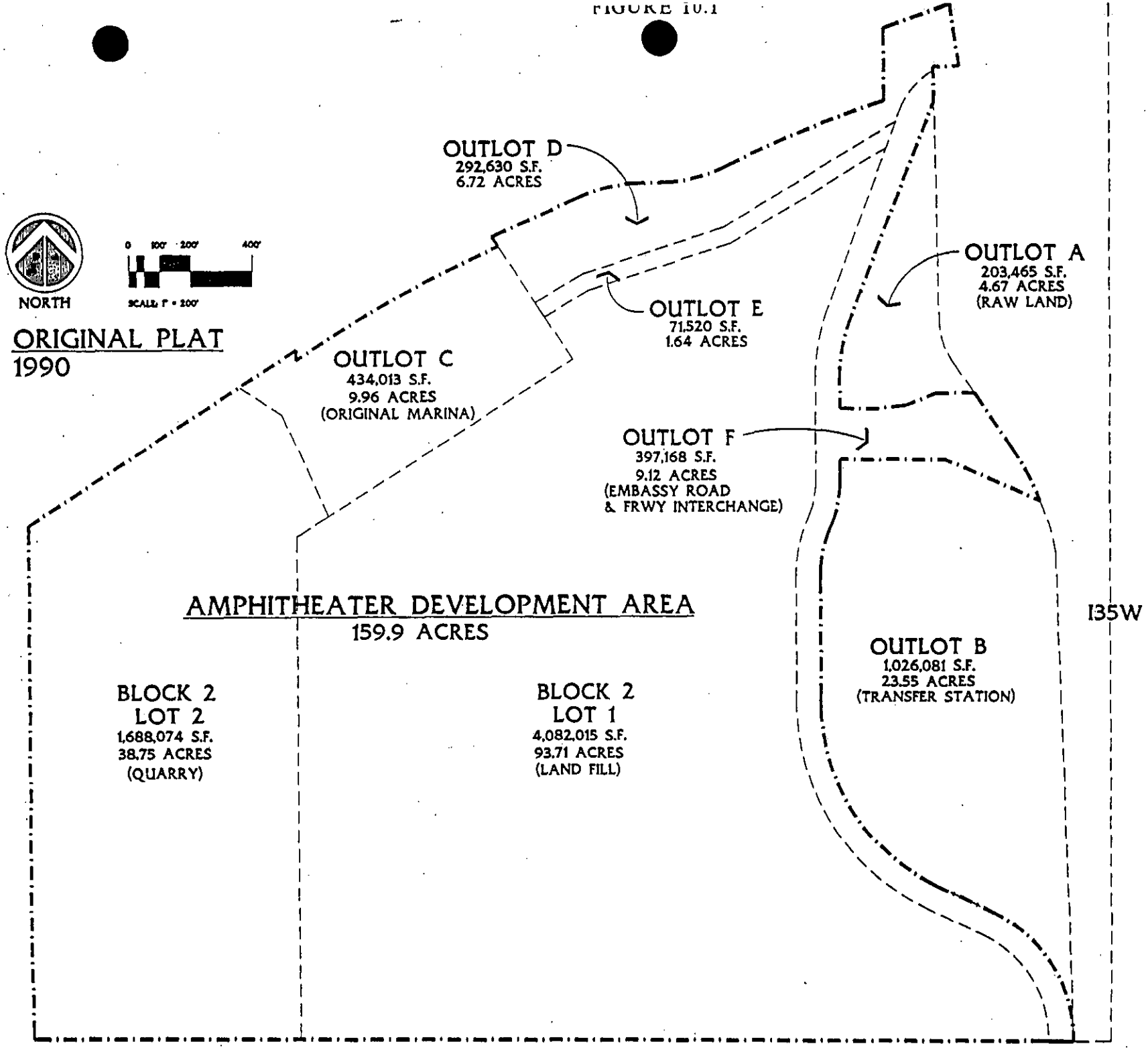
Area	Acres
Block 2, Lot 1: Landfill	93.71
Block 2, Lot 2: Quarry	38.75
Outlot A, Area next to freeway	n/a
Outlot B, Trash Transfer Station	n/a
Outlot C, Original marina site	9.96
Outlot D, Area south of Johnson Salt	6.72
Outlot E, Proposed road to marina	1.64
Outlot F, Embassy Road and Freeway Interchange	9.12
Total existing acreage	159.9

AFTER DEVELOPMENT

Area	Acres
Grass Berm Seating at Amphitheater	6.28
Building Area/Impervious Surface	
Amphitheater and Walkways	5.68
Quarry Bottom and Sides	17.00

Parking		
	Parking Adjacent to Amphitheater	8.60
	Gravel Parking at Amphitheater	53.47
Roadways		
	Paved (Embassy Road and Interchange)	4.13
	Gravel (Ticketing Magazines)	6.30
Ponding		
	Quarry NURP Pond	.79
	Major NURP Pond	6.65
All remaining Brush/Grassland/Trail Areas		51.00
	Total after development acreage	159.9

FIGURE 10.1


NORTH
0 100' 200' 400'
SCALE: 1" = 200'
ORIGINAL PLAT
1990
OUTLOT D
292,630 S.F.
6.72 ACRES
OUTLOT A
203,465 S.F.
4.67 ACRES
(RAW LAND)
OUTLOT E
71,520 S.F.
1.64 ACRES
OUTLOT C
434,013 S.F.
9.96 ACRES
(ORIGINAL MARINA)
OUTLOT F
397,168 S.F.
9.12 ACRES
(EMBASSY ROAD
& FRWY INTERCHANGE)
AMPHITHEATER DEVELOPMENT AREA
159.9 ACRES
I35W
OUTLOT B
1,026,081 S.F.
23.55 ACRES
(TRANSFER STATION)
BLOCK 2
LOT 2
1,688,074 S.F.
38.75 ACRES
(QUARRY)
BLOCK 2
LOT 1
4,082,015 S.F.
93.71 ACRES
(LAND FILL)

11. Fish, wildlife and ecologically sensitive resources.

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

Throughout the period from 1969 to the present, the subject property has been the site of very intensive activity. Virtually the entire area has been substantially altered through either mining or land filling activity. The vast majority of the native vegetative cover has been removed.

There is some habitat provided by the volunteer grasses that have emerged on the covered landfill and the fast growing, soft wooded species of trees that have grown around the perimeter of the land fill. The development plans proposed for the area are the installation of landscaping, including the creation of grass areas, as well as the creation of permanent ponding areas. Therefore, while the construction process may have some negative affect on wildlife habitat, the ultimate effect of the development will be to provide some additional wildlife habitat.

b. Are any state-listed (endangered, threatened or special concern) species, rare plant communities or other sensitive ecological resources such as native prairie habitat, colonial waterbird nesting colonies or regionally rare plant communities on or near the site?

There are no known native species of plant or animal that are officially listed as state endangered, threatened, or of particular concern present on the subject property.

12. Physical impacts on water resources.

Will the project involve the physical or hydrologic alteration – dredging, filling, stream diversion, outfall structure, diking and impoundment – of any surface waters such as a lake, pond, wetland, stream or drainage ditch?

Modification of Existing Dike

Preliminary plans for the development of the amphitheater called for the existing dike between the quarry and the Minnesota River to be increased in elevation, in order to protect the facility from the 100 year flood event. The floodplain analysis conducted by Eugene A. Hickock & Associates (See Section 14) indicated that this increase in elevation would result in an increase in flood elevations upstream. This fact was reviewed with representatives of the Minnesota Department of Natural Resources and the U.S. Army Corps of Engineers and it was agreed that the elevation of the dike should not be increased beyond the 713.3-foot elevation.

The City has retained S.E.H. to study this issue further. S.E.H. met independently with representatives of the US Army Corps of Engineers, DNR and the Lower Minnesota River Watershed District to discuss the base hydraulic model for the analysis and to agree upon an appropriate methodology for analyzing the site. The hydraulic modeling was intended to determine the maximum levee height in the current location without increasing the 100-year profile on the river. Based on the revised model, SEH found that the maximum levee height in the current location would be 709.5 without increasing the 100-year profile on the river. Therefore, the existing levee would need to be lowered from it's current elevation to an elevation no higher than 709.5. This elevation coincides with the 710.0 no-occupancy elevation that appears in the 1990 PUD agreement for the site.

As a result of the final hydraulic analysis, it is proposed to lower the existing levee to match the pre-levee contours, and reconstruct a new levee approximately 800 feet to the south of the existing levee. The hydraulic modeling indicates that a levee constructed in this location, while in the 100-year floodplain, would keep the proposed project out of the floodway. The new levee location could be constructed to elevation 720.0, providing flood protection to the proposed amphitheater for the 100 year flood on the Minnesota River without increasing the 100 year profile of the river and without causing any additional flood-related issues for upstream communities. The modeling is under review of the U.S. Army Corps of Engineers and DNR at this time.

Wetland Impact

The amphitheater project and the related infrastructure to serve the site will

affect existing wetland resources. The proposed 113th Street Interchange and that portion of Embassy Road within the project site had previously been reviewed for wetland impacts. The results of the review and subsequent mitigation plan were included in an U.S. Army Corps of Engineers permit issued for the interchange project. Due to additional impacts on the site itself and from the proposed infrastructure serving the site, it was decided to look at all impacts and mitigation as part of one single analysis, and approach the entire project as a single wetland permit.

Figure 12.1 illustrates existing conditions of the area as well as impact sites and proposed mitigation. Figure 12.2 provides the same information from a slightly different perspective. Figure 12.3 illustrates the amphitheater project site and related infrastructure.

The following describes the wetland impacts. The table, which follows further, summarizes both impacts and mitigation for the project.

The 113th Street Interchange project (already permitted by the U.S. Army Corps of Engineers and approved under the Wetland Conservation Act (WCA)), creates 1.88 of wetland fill adjacent to I-35W (see figure 12.3). Two acres of new wetland creation along with 2.28 acres of public value credits for a proposed storm water pond and upland buffer to the wetland is part of the mitigation plan. The permit application was submitted to Mr. Dan Seemon on June 9, 1999.

Embassy Road, which will serve the property from the south, creates 2.36 acres of wetland fill; 0.75 acres of impact lies south of the amphitheater site while 0.47 acres of impact lie within the amphitheater parcel. The 0.47 acre impact was also covered under the existing U.S. Army Corps of Engineers permit described in the previous paragraph.

The amphitheater's south access road, directly south of the south property line, extends westerly from Embassy Road to the proposed amphitheater location. The south access road was located in this area at the request of MPCA, who is preparing a landfill closure plan on the site. MPCA has requested that the access road not be located on top of the future landfill cap, limiting the alternatives for the access road locations and for minimizing wetland impacts. The south access road crosses an area that exhibits some wetland characteristics. The site has been monitored and will continue to be monitored to determine if there is hydrology present to classify it as wetland or if the site can be declared non-jurisdictional. Until such time, the site is being treated as wetland. Therefore the south access road will create 1.58 acres of wetland fill.

The existing north-south oriented levee on the west property line of the project will be removed to comply with U.S Army Corps of Engineers March 2000 directives to the property owner, thus restoring the wetland area that existed

prior to the levee construction. The existing levee removal is also necessitated by the fact that it does not have the long-term structural integrity to provide adequate flood control to the project. Approximately 900 feet of levee, starting at the southwest corner of the site and extending north, will be reconstructed for the purpose of flood control. This new levee will not create any increase in the 100 year profile on the river. Reconstruction of the levee will create 2.29 acres of new wetland impact, to be mitigated on-site.

The City retained the services of SEH Inc. to conduct a field investigation to verify the existence of wetlands in the quarry bottom. Both the City of Burnsville's 1998 Comprehensive Wetland Protection and Management Plan and the National Wetland Inventory show wet areas in the quarry bottom based on aerial photography. The SEH on-site investigation was conducted by a wetland specialist, Wayne Jacobsen, registered as professional wetland scientist and certified as a soil scientist. The field investigation focused on three elements: hydrology, wetland soils and wetland vegetation. The wet areas were found to exist within depressions in the rock at the bottom of the quarry, were lacking soil and wetland vegetation. The result of the evaluation finds that there are no wet areas in the quarry bottom that meet the definition of jurisdictional wetlands for the U.S. Army Corps of Engineers or the Wetland Conservation Act. Therefore, no wetlands permit is required for the quarry bottom.

A final wetland area on the site will be unaffected by the project. A wetland complex in the northeast part of the site is located just south of the U.S. Salt property. No impacts are anticipated in this area.

In addition to these project-related impacts, prior wetland impacts to the site exist, as referenced in the U. S. Army Crops of Engineers correspondence to Michael McGowan in March 2000. Based upon meetings with U.S. Army Corps of Engineers both on-site and in-office, it is estimated that the existing levee and formerly proposed marina site constitute the entire prior impact area. Based on these discussions, the impact area has been estimated by comparing the existing site contours to contour mapping that existed in the mid-to late1970s. Based on this comparison and calculating the footprint of the levee fill above elevation 700.0 as well as the excavation of the formerly proposed marina site below elevation 702.0, it is estimated that the prior impact amounts to about 13.7 acres.

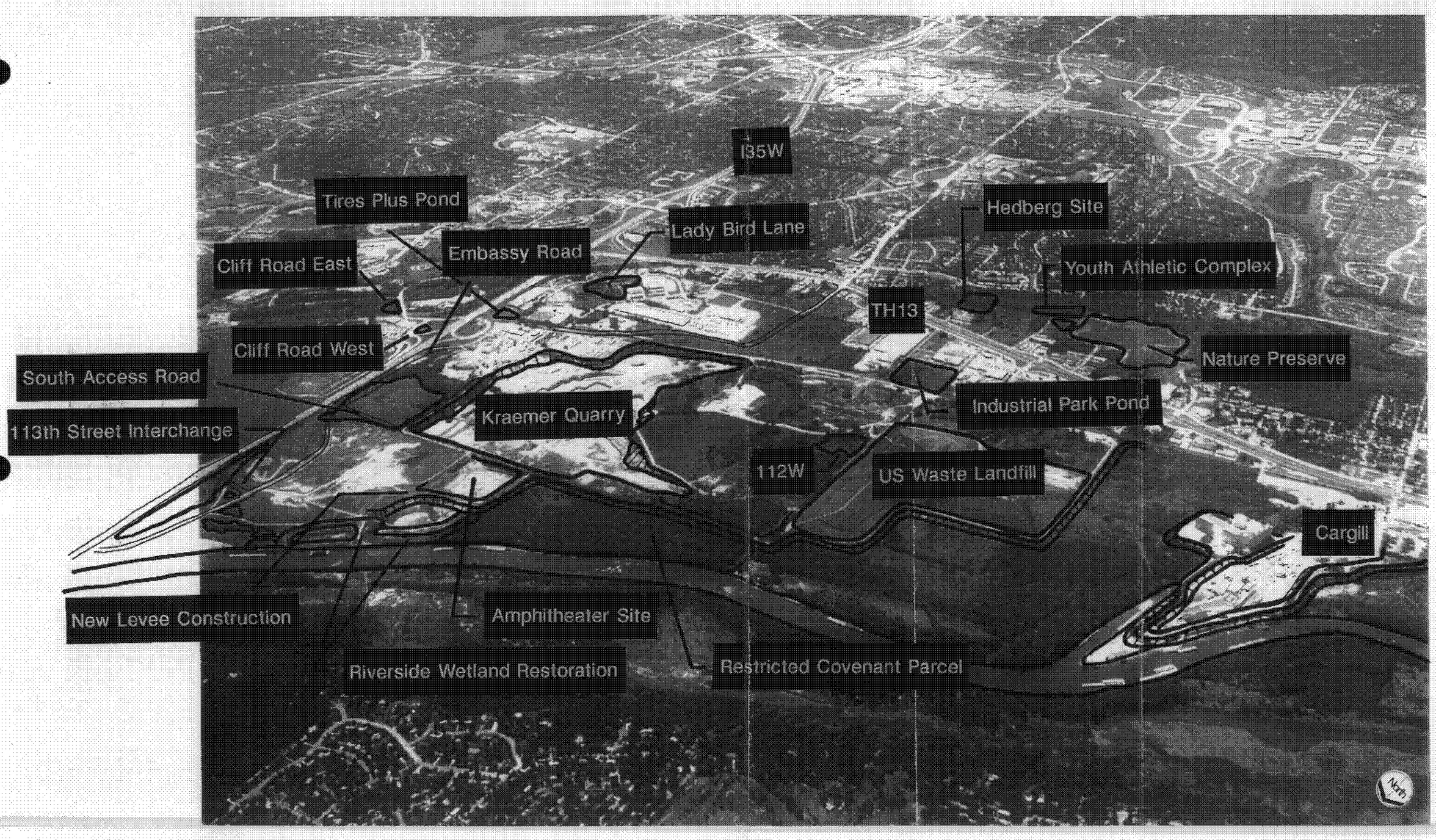
During discussions with the U.S. Army Corps of Engineers staff, it was generally agreed that removal of the existing levee (approximately 3400 lineal feet) and redepositing the material adjacent to and landward of the existing levee at an elevation that would match the contours of the site prior to filling would address the impact issue. In addition, the excavated area in the location of the formerly proposed marina would need to be filled to an elevation to match pre-excavation elevations. These "restoration" areas would be graded to be seasonally flooded with fluctuation of the Minnesota River level to create

shallow marsh wetland habitat. In addition to the restoration area, U.S. Army Corp of Engineers staff indicated that maintaining the Edward Kraemer and Sons property west of the site as flood plain would favorably impact their review of the restoration. In accordance with the City's Comprehensive Plan and the Planned Unit Development agreement covering this parcel – owned by Edward Kraemer and Sons, the land will remain in floodplain forest condition in perpetuity, buffering the amphitheater site. Therefore, both stated conditions of the U.S. Army Corps of Engineers have been met.

Proposed mitigation for the site is illustrated on Figures 12.1, 12.2 and 12.3, and is summarized in the following table. A total of 6.97 acres of wetland impact is anticipated. Up to 12.59 acres of new wetland have already been or can be created based on the final permit requirements. An additional 14.45 acres of public value create has been or can be created, based on the final permit. Preparation of and Individual permit is now underway.

Wetland Impacts						
		Type				
113th Street Interchange	1.88 acres	2/6				
Embassy Road –on-site	0.47 acres	2/6				
Embassy Road south of site	0.75 acres	2				
South Access Road	1.58 acres	2				
New Levee	2.29 acres	1L				
Total Impact	**6.97 acres**					
Potential Mitigation	**New Wetland Creation**	**Type**	**New Pond Creation**	**Pond Public Value Credit**	**Upland Creation**	**Upland Public Value Credit**
113th Street Interchange	2.0 acres	2/6	0.50 acres	0.38 acres	2.53 acres	1.90 acres
Cliff Road East	0.64 acres	2/3	0.50 acres	0.38 acres	1.15 acres	0.86 acres
Cliff Road West	0	M	0.42 acres	0.31 acres	0	0
Tires Plus Pond	0	M	1.4 acres	1.05 acres	0	0
Hedberg Site	2.01 acres	2	0	0	1.02 acres	0.76 acres

Industrial Park Pond	2.90 acres	4	2.52 acres	1.89 acres	2.06 acres	1.54 acres
Youth Athletic Complex (banked credits)	2.09 acres	4	0	0	1.60 acres	1.20 acres
North Sediment Pond (on-site)	0	M	5.58 acres	4.18 acres	0	0
North East Wetland	1.30 acres	2	0	0	0	0
Additional Riverside Restoration	1.65 acres	4	0	0	0	0
Subtotals	**12.59 acres**			**8.19 acres**		**6.26 acres**
Total Mitigation	**27.04 acres**					



Aerial Photograph - Looking South (Taken August 1996)

Existing Conditions - Burnsville Gateway Area

FIGURE 12.1

Aerial Photograph - Looking West (Taken August 1996)
Existing Conditions - Burnsville Gateway Area

FIGURE 12.2

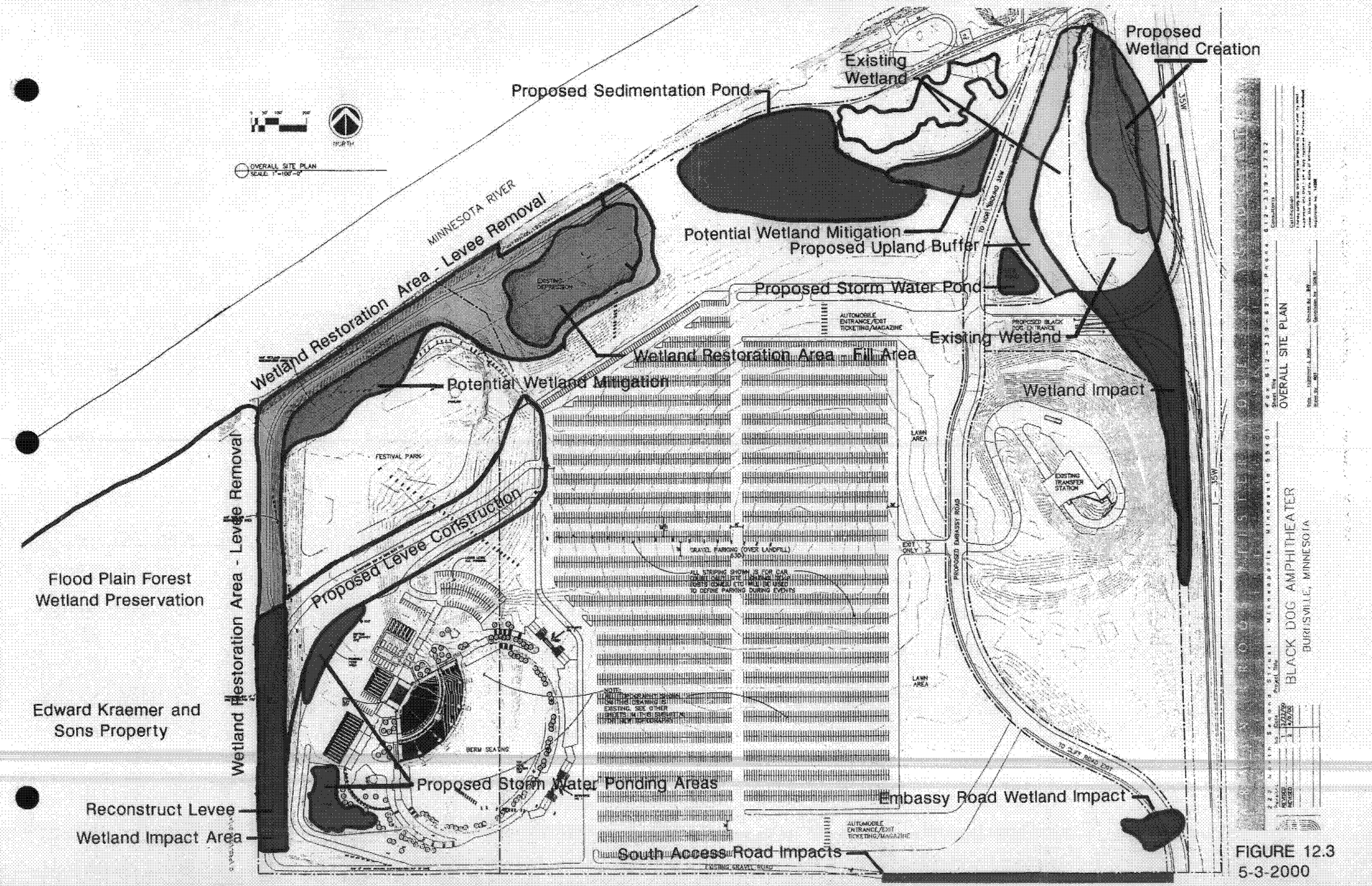


FIGURE 12.3
5-3-2000

13. Water Use

Will the project involve installation or abandonment of any water wells, connection to or changes in any public water supply or appropriation of any ground or surface water (including dewatering)?

The project will have no effect on any wells, either on-site or off the site. The proposed development will be served by public water service and will not require the appropriation of any ground or surface water.

The CRA Remedial Investigation Report for the Freeway Landfill site, prepared in February 1988 includes information about both existing and past monitoring well locations. Figure 13.1 illustrates the locations of the past monitoring well locations. Figure 13.2 illustrates the locations of the existing monitoring wells. Copies of the results of the samples taken from these monitoring wells are available for review. The information from past and current monitoring will be utilized in the preparation of the closure plan for the Freeway Landfill.

As long as the Kraemer quarry remains in operation and dewatered, the amphitheater development will have no impact on ground water. In the distant future, once the Kraemer quarry is abandoned and allowed to fill with water, groundwater levels in the area of the amphitheater will rise. Under this future condition, groundwater wells and pumping will be required to keep the amphitheater dry. As this will be a continuous full time operation, groundwater levels around the site will be lowered. Future dewatering operations are unknown at this time, but groundwater levels will probably be lowered to a lesser extent than the current Kraemer dewatering operations which pumps ground water a the rate specified in the permit authorized by the DNR.

At present, the City is studying a project to construct new municipal wells up-gradient of the Kraemer quarry to minimize existing dewatering volumes and minimize other regional groundwater concerns. These wells would also reduce future dewatering at the amphitheater to some extent.

FIGURE 13.1

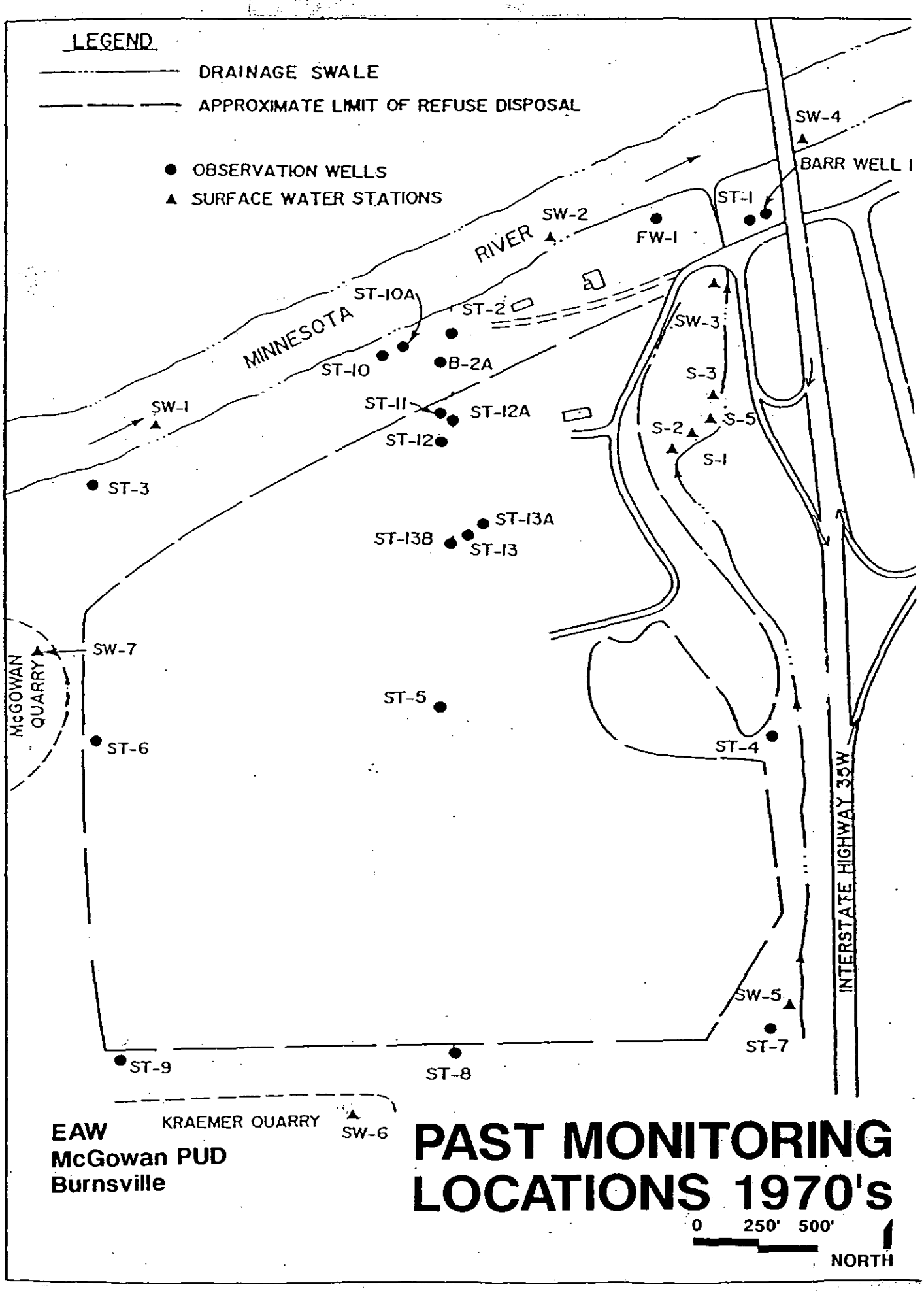
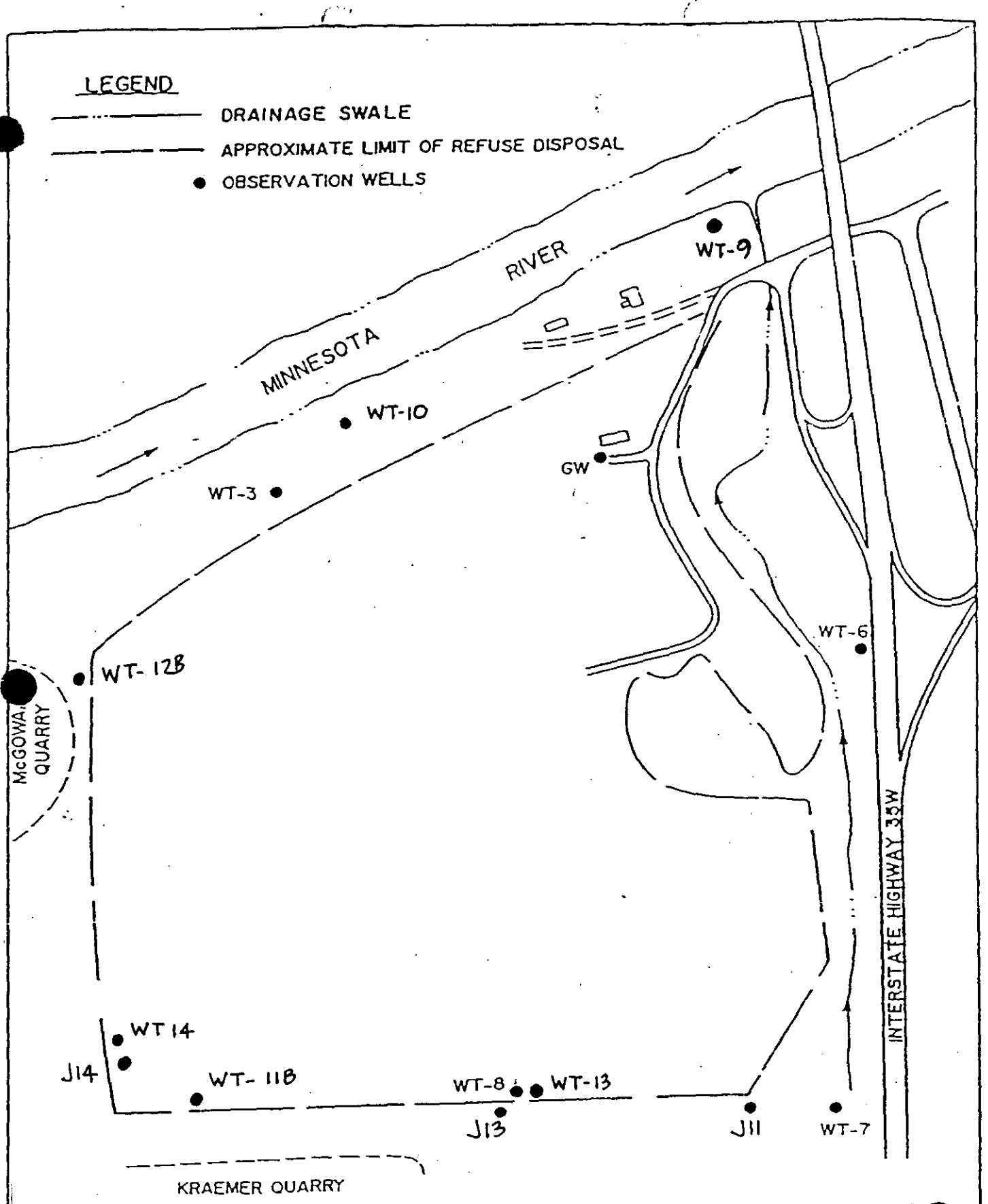

LEGEND
DRAINAGE SWALE
APPROXIMATE LIMIT OF REFUSE DISPOSAL
OBSERVATION WELLS
SURFACE WATER STATIONS
MINNESOTA RIVER
SW-4
BARR WELL I
ST-1
FW-1
SW-2
ST-10A
ST-2
SW-3
ST-10
B-2A
S-3
SW-1
ST-11
ST-12A
S-2
S-5
ST-12
S-1
ST-3
ST-13A
ST-13B
ST-13
SW-7
McGOWAN QUARRY
ST-5
ST-6
ST-4
INTERSTATE HIGHWAY 35W
SW-5
ST-7
ST-9
ST-8
KRAEMER QUARRY
SW-6
EAW
McGowan PUD
Burnsville
PAST MONITORING LOCATIONS 1970's
0 250' 500'
NORTH

FIGURE 13.2



EAW
McGowan PUD
Burnsville

EXISTING MONITORING LOCATIONS

14. Water-related land use management district.

Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? If yes, identify the district and discuss project compatibility with district land use restrictions.

The 1977 Flood Insurance Study for the City of Burnsville classifies the McGowan landfill area as a regulated floodplain district zone A20. Zone A20 is an area within the 100-year floodplain that has its base flood elevation and flood hazard factors determined. The 100-year base flood elevation varies across the site from about 717 to 718. The portion of the site that has been quarried, which will be the location of the amphitheater, is currently in the designated floodway and the landfill area is in the flood fringe. These areas are subject to the City of Burnsville floodplain regulations, Section 10 of the City Code.

In 1989, the City of Burnsville retained Eugene A. Hickock and Associates to conduct a floodway and floodplain analysis related to the proposed development. That report was included in its entirety in the 1989 EAW. The City has retained S.E.H. to conduct a new floodway and floodplain analysis and they will collaborate with the U.S. Army Corps of Engineers, MnDNR and the Lower Minnesota River Watershed District in this analysis. The results of this analysis found that the maximum levee height in the current location would be 709.5 without increasing the 100 year profile on the river. Therefore, the existing levee will need to be lowered from its current elevation to an elevation no higher than 709.5. This elevation coincides with the 710.0 no-occupancy elevation that appears in the 1990 PUD agreement for the site. However, as a result of the final hydraulic analysis, it is proposed to reconstruct a new levee approximately 800 feet to the south of the existing levee. The hydraulic modeling indicates that a levee constructed in this location, while in the 100-year floodplain, would keep the proposed project out of the floodway. The new levee location could be constructed to elevation 720.0, providing flood protection to the proposed amphitheater for the 100 year flood on the Minnesota River without increasing the 100 year profile of the river and without causing any additional flood-related issues for upstream communities. The modeling is under review of the U.S. Army Corps of Engineers and DNR at this time.

15. Water surface use.

Will the project change the number or type of watercraft on any water body?

__Yes _X_No

16. Erosion and sedimentation.

Give the acreage to be graded or excavated and the cubic yards of soil to be moved:

Virtually the entire site will be altered as part of the landfill closure. Erosion control and other best management practices will be incorporated into the MPCA's plans for landfill closure.

Site Geology

The R.B. McGowan Property is underlain by a variety of glaciofluvial and modern alluvial materials and bedrock. Extensive soil borings have been taken on the property through the years of its operation as a sanitary landfill. These borings provide information about the basic geology of the site.

In February of 1988, Conestoga-Rovers & Associates prepared a Remedial Investigation report for the Freeway Landfill Site. The CRA Remedial Investigation included two geologic cross sections of the McGowan Property. Figure 16.1 illustrates the locations of the two cross sections (A-A' and B-B'). Figure 16.2 represents the A-A' geologic cross section and the B-B' cross section is illustrated on Figure 16.3.

Based upon the information gained from the soil borings conducted by Barr Engineering in 1970 and CRA in 1987, the following basic summary of site geology can be made:

1. Land filled municipal waste, up to 32.5 feet thick.

2. Up to 15 feet of sandy loams and fine loamy sands thinning to the south.

3. Variable thicknesses of silty cohesive loams, clay loams, and peat. These low-permeability deposits also thin to the south and lie directly on bedrock. Depth to bedrock ranges from 20 to 51 feet below the northern portion of the Site to 3 to 19 feet below the southern property line.

4. The Prairie du Chien Group dolomites lie beneath the surficial deposits at the Freeway Landfill Site. Thickness ranges from 75 to 120 feet. Visual inspection of the dolomite exposed in the nearby Kraemer quarry and McGowan quarry reveals that it is weathered and extensively fractured.

5. The Jordan sandstone underlies the Prairie du Chien dolomites below the Freeway site.

Steep Slopes

There are currently some areas of steep slopes evident on the property, particularly in the existing quarry area. These slopes will be stabilized through the grading and construction process.

Erosion and Sedimentation

A grading plan will be prepared and included in the Planned Unit Development plans. This plan will feature erosion control measures including silt fence, storm drainage inlet protection and other Best Management Practices to be employed on the site during construction in accordance with the City of Burnsville standards and the MPCA issued National Pollutant Discharge Elimination system (NPDES) General Permit for the project.

The standards of the City of Burnsville require permanent or temporary soil stabilization of disturbed areas within 15 days after final grading and within 30 days in areas that may not be at final grade, but will remain dormant for more than 90 days. The standard requires soil stockpiles to be stabilized or protected with sediment trapping measures, protection of adjacent properties from sedimentation and minimization of the transport of sediment and mud run-off or vehicle tracking onto adjacent roadways. Erosion and sediment control measures will be installed prior to the initiation of grading or other land disturbance and maintained and/or repaired as needed to assure continued performance.

The amphitheater itself is situated in the quarry, which has no gravity outlet. Two ponds are proposed in the quarry bottom. The ponds will be designed to retain sediment based on NURP standards. Operation of the pumped outlet system will include provisions to maximize settling time prior to pumping and minimize the resuspension of accumulated sediments. Discharge of the pumped water will be through the on-site wetland complex lying between the amphitheater site/quarry bottom and the river. This area will provide additional filtering of the pumped runoff before it reaches the river.

The Burnsville Engineering Department will review the proposed grading plan, and improvements to these erosion control measures will be required prior to the issuance of a grading permit. Over the past several years, the City of Burnsville has made it a practice to consult with the Dakota County Soil and Water Conservation District on projects that involve significant land alteration. The City plans to request the assistance of the Dakota County SWCD on this project and to incorporate any reasonable additional sedimentation and erosion control measures they recommend.

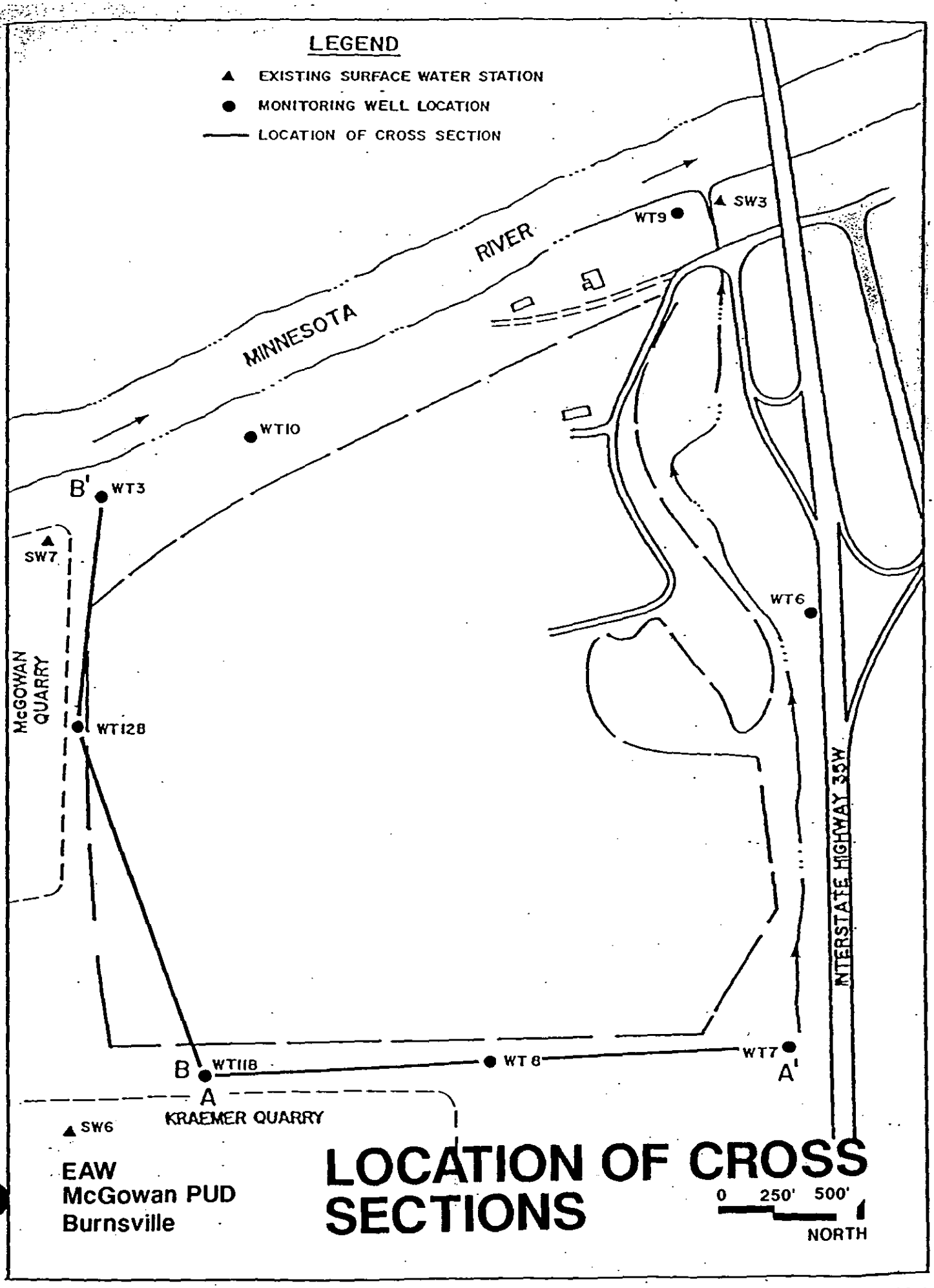

LEGEND
EXISTING SURFACE WATER STATION
MONITORING WELL LOCATION
LOCATION OF CROSS SECTION
MINNESOTA RIVER
SW3
WT9
WT10
B'
WT3
SW7
WT6
McGOWAN QUARRY
WT12B
INTERSTATE HIGHWAY 35W
B
WT11B
WT 8
WT7
A'
A
KRAEMER QUARRY
SW6
EAW
McGowan PUD
Burnsville
LOCATION OF CROSS SECTIONS
0 250' 500'
NORTH

Figure 16.1

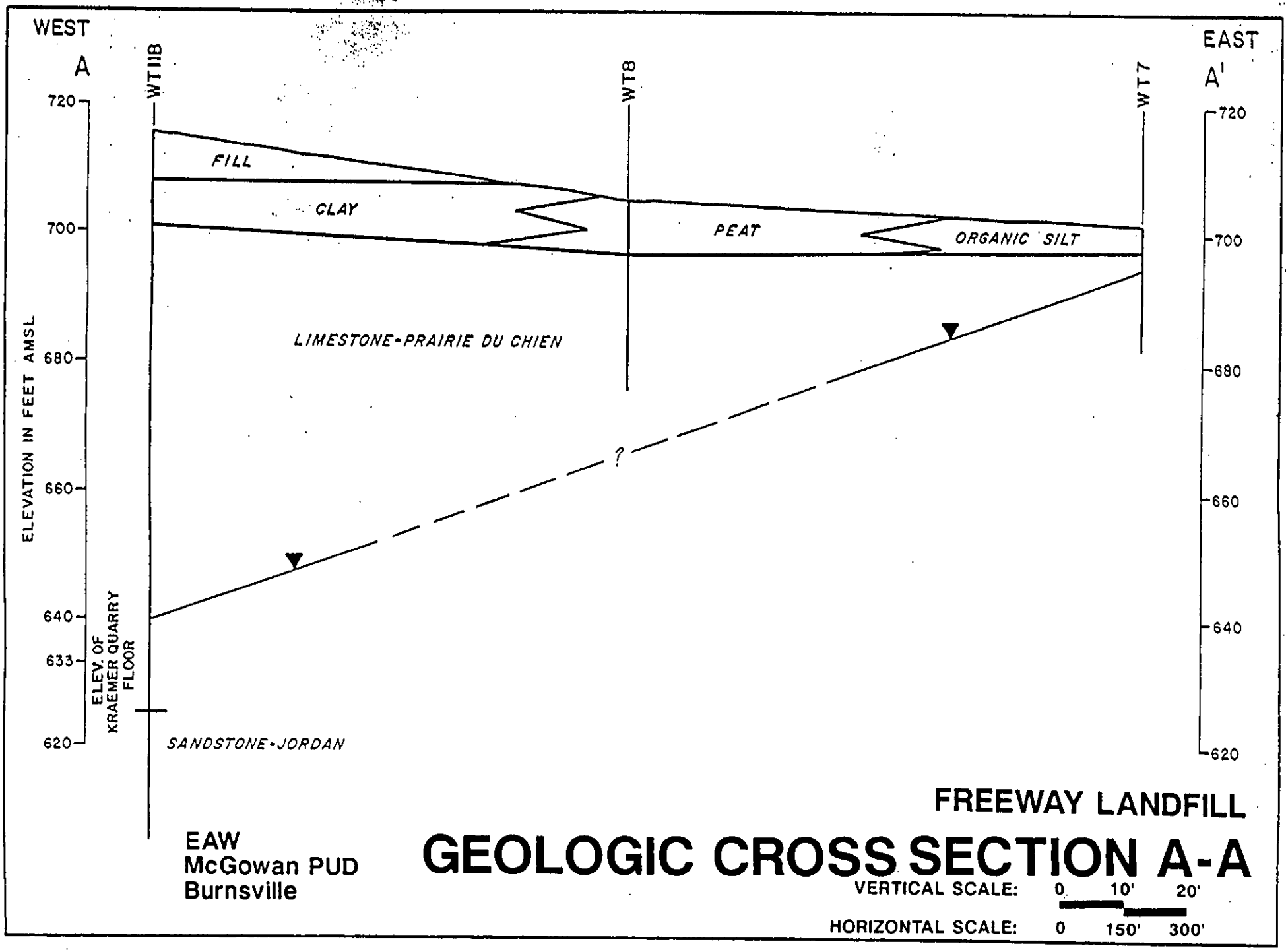

WEST
A
EAST
A'
WT11B
WT8
WT7
720
700
680
660
640
633
620
ELEVATION IN FEET AMSL
FILL
CLAY
PEAT
ORGANIC SILT
LIMESTONE-PRAIRIE DU CHIEN
?
ELEV. OF KRAEMER QUARRY FLOOR
SANDSTONE-JORDAN
FREEWAY LANDFILL
GEOLOGIC CROSS SECTION A-A
EAW
McGowan PUD
Burnsville
VERTICAL SCALE: 0 10' 20'
HORIZONTAL SCALE: 0 150' 300'

Figure 16.2

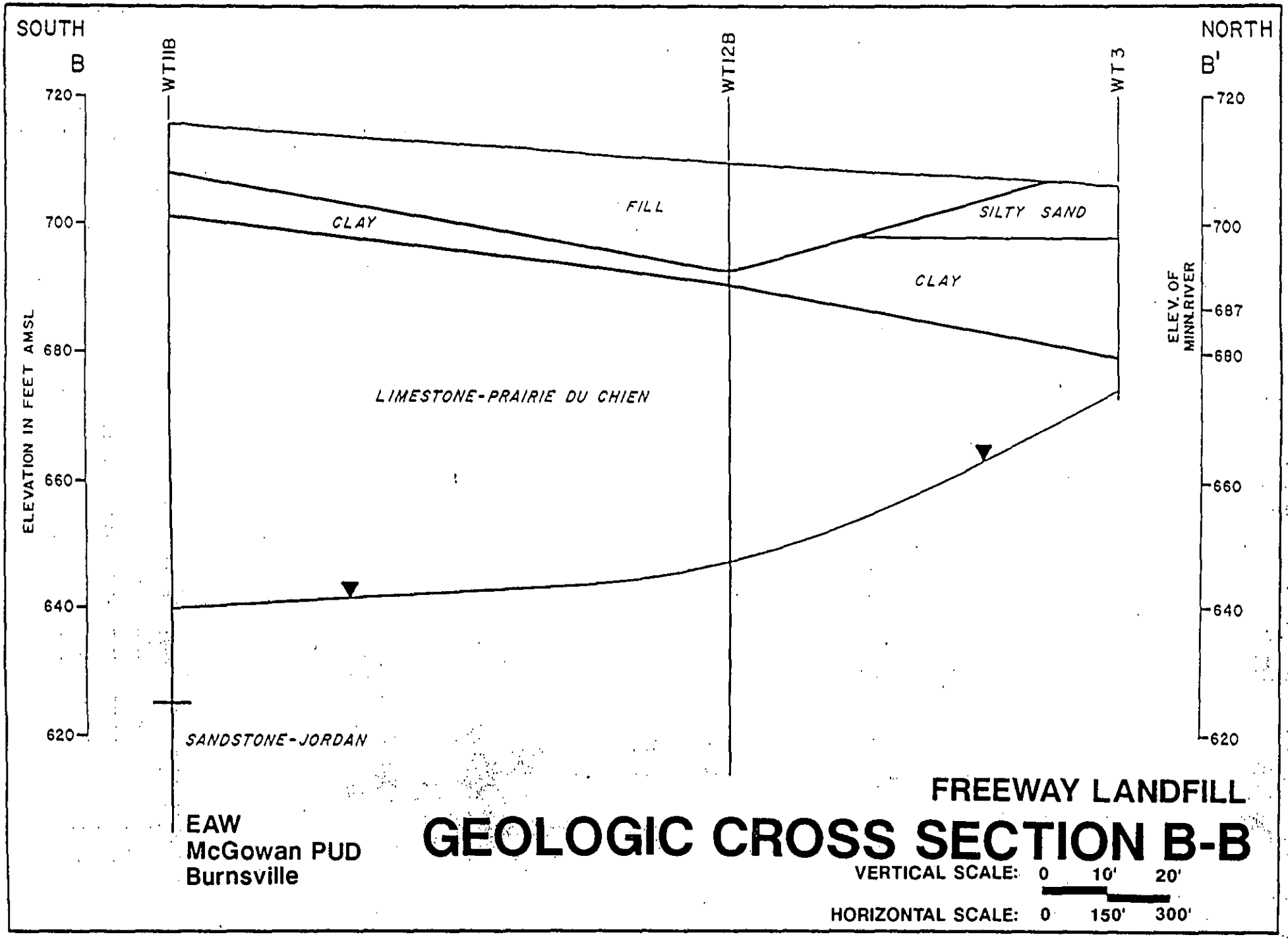

SOUTH
B
NORTH
B'
WT11B
WT12B
WT3
720
700
680
660
640
620
ELEVATION IN FEET AMSL
ELEV. OF MINN. RIVER
687
FILL
CLAY
SILTY SAND
CLAY
LIMESTONE-PRAIRIE DU CHIEN
SANDSTONE-JORDAN
FREEWAY LANDFILL
GEOLOGIC CROSS SECTION B-B
EAW
McGowan PUD
Burnsville
VERTICAL SCALE: 0 10' 20'
HORIZONTAL SCALE: 0 150' 300'

Figure 16.3

17. Water quality: surface water runoff

a. Compare the quantity and quality of site runoff before and after the project. Describe permanent controls to manage or treat runoff. Describe any stormwater pollution prevention plans.

b. Identify routes and receiving water bodies for runoff from the site; include major downstream water bodies as well as the immediate receiving waters. Estimate impact runoff on the quality of receiving waters.

Surface and Stormwater Runoff

Stormwater runoff from the eastern 3/4 of the development will be picked up by storm sewer either east to an existing ditch (planned to be upgraded by the City of Burnsville) or north to a sedimentation detention pond. This area is predominantly parking area and is located generally above the Minnesota River H.W.L.

Figure 12.1 illustrates the location of the proposed stormwater ponds for the project. Stormwater ponding is provided within the quarry itself for the stage/performance area and related paved areas. Water from this area will be pumped out through the on-site wetland complex lying between the amphitheater site/quarry bottom and the river. This area will provide additional filtering of the pumped runoff before it reaches the Minnesota River. A second pond on-site will serve for both rate control and quality enhancement. Storm drains from the parking area will be directed through the ponding areas so that the 2, 10 and 100 discharge rates can be controlled to meet pre-development standards, in accordance with the City's Stormwater Management Plan. All site engineering will be reviewed by the City for consistency with these standards. The pond will also provide water quality treatment as required by the City's 1998 Wetland Protection and Management Plan.

Additional sedimentation ponding is located at the southeast corner of the site and near the proposed interchange.

The large pond just south of the river and to the northeast of the quarry is in the floodway. Elevations around the pond are such that an adequate vegetative buffer will be established to prevent scouring of the pond slopes during a flood event. The final grading plan will include a plan for pond maintenance, making the ponds drainable to facilitate cleaning, and will address access for maintenance.

The fractured rock underlying the site has a very high permeability, which will promote infiltration and reduce volumes of overland discharges to the river.

A buffer area between the river and the developed site will be maintained. The buffer will include City park elements and a trail system along with the

maintenance of natural vegetated areas.

The western 1/4 of the site is the location of the quarry, and it is generally located below the Minnesota River elevation, separated from it by a dike. A storm sewer system will collect the runoff in this area and direct it through as series of ponds. Ponding will be designed to accommodate a 100-year event and a storm sewer pumping station will discharge through the on-site wetland complex lying between the amphitheater site/quarry bottom and the river. This area will provide additional filtering of the pumped runoff before it reaches the Minnesota River.

The storm drainage from the site will ultimately be discharged into the Minnesota River. The storm sewer system will be designed using the rational method and a ten year return period. The on-site and off-site storm water systems are being designed to limit peak discharges and maximize the removal of sediment and sediment borne pollutants.

The MPCA staff and consultants are working on the closure plans for the Freeway Landfill, and that when this work is completed, the City will be in a better position to evaluate the potential for pollutants in the water seeping into the amphitheater area. The City's hydrologists do not anticipate that the amphitheater will be drawing much, if any, water from the landfill. This issue will be evaluated as the closure plan nears completion. The City may require some sampling of water discharged from the site. The City would then identify whatever treatment was necessary based upon the laboratory tests.

The floor of the amphitheater is proposed to be 672, about 16 feet below the normal elevation of the Minnesota River. The Kraemer quarry to the south will be excavated to elevation 610, according to the PUD document prepared by McCombs Frank Roos Associates, Inc. dated February 1994. At the Kraemer quarry, groundwater and surface water is collected in the quarry bottom and pumped up into a series of ponds before discharging through the flood plain forest wetland complex lying between the quarry and the Minnesota River. The pumping operation is performed in accordance with a Minnesota Department of Natural Resources Water Appropriation Permit.

The Kraemer quarry is projected to remain in operation until 2017 according to the February 1994 PUD document. At that time, the existing dewatering operation will cease to function and the Kraemer quarry will fill to and elevation that will mirror the river elevations. The City plans to install a future pumping station at the Kraemer quarry that will pump surface waters to the Minnesota River to minimize the extent to which the Kraemer quarry will significantly exceed normal river levels and to control flooding in the quarry during a flood event on the Minnesota.

Once the Kraemer quarry fills, the amphitheater quarry bottom will likely require

dewatering to control seepage into the site from the Kramer quarry to the south and the river to the north and west. The site design will incorporate seepage control piping within the proposed levee systems on the west and north sides of the amphitheater. Future seepage control piping along Kraemer's existing levee to the south will likely be needed to intercept inflow and discharge it to the pond system in the quarry bottom, where it will be pumped out into the adjacent wetland complex.

At this time, MPCA's 10 percent plan for the landfill closure includes an impermeable liner over the top as well as west slopes of the landfill which are directly adjacent to the amphitheater. The liner is proposed to prevent infiltration of water into the garbage below. The liner will also serve as a barrier to the exfiltration of leachate and methane, according to MPCA's Ron Schwartz and Peter Tiffany. The levee system being constructed for the amphitheater is a major benefit to the control of seepage into the landfill since the entire west side of the landfill will be kept dry for events up to the 100 year flood on the river.

Without the quarry area and the dewatering system in place, any seepage from the landfill would collect in the quarry where is would build up before discharging to the Minnesota River, representing a potential environmental hazard. This issue was recognized by MPCA in 1981. In responding to a request for a Section 401 Water Quality Certification for the formerly proposed marina on this same site, MPCA cited concerns about leachate. The letter from then Executive Director Louis J. Breimhurst noted how the 400-foot setback of the landfill acted to provide the attenuation of leachate and reduced the strength of the leachate that seeped laterally to the river through the silty-clay levee material. The letter cited past studies by Barr Engineering Company regarding seepage of leachate through the silty-clay material and the benefits of a significant soil mass between the landfill and a potential exit of leachate to the environment. The current design of the amphitheater relies on such a soil mass to act as the grass seating areas. This soil mass will act together with a planned synthetic liner to significantly reduce seepage of leachate and the concentration of contaminates in the seepage that might reach the quarry bottom ponds.

On March 8, 2000, Mr. Peter Tiffany and Mr. Schwartz from MPCA met at the City of Burnsville with City officials to discuss the landfill related issues on site. MPCA identified that the proposed "vertical liner" installation planned for the west side of the landfill (facing the amphitheater) and the related fill necessary for the amphitheater site would act as insurance for the landfill, preventing migration of water into the garbage and limiting the movement of methane and leachate from the landfill. The issue of a new cone of depression being created by the amphitheater dewatering was discussed. When the Kraemer quarry fills with water, the groundwater gradient will re-establish itself towards the river (today, Kraemer's quarry causes a very large cone of depression, greatly impacting area ground water gradients). With the groundwater gradient re-

established in a south-north direction, leachate would have to move cross-gradient (west/southeast) towards the amphitheater dewatering. The difficult in cross-gradient movement will minimize the significant seepage of leachate from the landfill.

Once the Kraemer quarry dewatering operation ceases, an on-site monitoring program in the amphitheater pond system will be developed to identify the extent to which, if any, landfill contamination would be drawn into the quarry bottom by the operation of a dewatering system. The dewatering system design will be prepared to prevent migration of contaminants into the ponding system and will require permits from both the Minnesota Department of Natural Resources and MPCA. In addition, the City is investigating the feasibility of a new groundwater well field to be installed up-gradient and south of the Kraemer quarry to serve the City's long term needs as well as the regional potable water needs. The well field location and its impact on groundwater movement are being studied at this time.

18. Water quality: wastewaters

a. Describe sources, composition and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.

b. Describe waste treatment methods or pollution prevention efforts and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies, and estimate the discharge impact on the quality of receiving waters. If the project involves on-site sewage systems, discuss the suitability of site conditions for such systems.

c. If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pretreatment provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying any improvements necessary.

d. If the project requires disposal of liquid animal manure, describe disposal technique and location and discuss capacity to handle the volume and composition of manure. Identify any improvements necessary. Describe any required setbacks for land disposal systems.

Sanitary Wastewater

The amphitheater will host 25 to 35 events per season. The facility is expected to sell out only four to six times per season. The development will be served with public sanitary sewer. Based upon the MCES standard for arenas a maximum capacity event at this facility could generate approximately 50,000 gallons of sanitary wastewater. The design of the sanitary sewer system will accommodate these peak flows, but it should be recognized that the occurrence of such a rate would be very infrequent.

Industrial Wastewater, Cooling Water

The Project will not generate any industrial wastewater or cooling water.

19. Geologic hazards and soil conditions

a. Approximate depth (in feet)

To groundwater*: 3 ft. minimum, 27 ft. average, total range of 3 to 51 ft.

To bedrock on northern end of the site: 20 ft. minimum, 35.5 average, total range of 20-51 ft. below the surface

to bedrock on the southern end of the site: 3 ft. minimum, 11 ft. average, total range of 3-19 ft. below the surface

*the water table lies within the bedrock

Describe any of the following geologic site hazards to ground water and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due to any of these hazards.

Site Groundwater Hydrology

The R. B. McGowan property contains a minimum of 3 feet and a maximum of 50 feet of overburden. This material overlies the bedrock, which is of the Prairie du Chien Group. The water table lies within the bedrock.

Prior to the extensive limestone mining that has occurred on the Edward Kraemer property, immediately south of the subject property, the direction of groundwater flow was from the south to the north. Due to the dewatering activities in the Kraemer quarry, the flow beneath the McGowan property has been reversed. It now flows to the southwest and discharges to the Kraemer quarry.

Table 19.A is taken from the Remedial Investigation Report prepared by CRA in 1988. This table summarizes the groundwater elevations measured during the Remedial Investigation. The location of these wells is illustrated on both figures 19.1 and 19.2. Figures 19.1 and 19.2 represent groundwater contours and flow patterns on May 18, 1987 and January 12, 1988, respectively.

As these two figures illustrate, the direction of groundwater flow varied little between these two dates. Both figures illustrate that the static water level surface slopes downward approximately 50 feet over a 4,000 foot distance south and west under the site, towards the pumping center near the western edge of the Kraemer quarry.

Since it is known that the direction of groundwater flow was formerly to the north, discharging into the Minnesota River, the information presented on figures 19.1 and 19.2 support the following conclusions:

1. The direction of the flow of groundwater has been reversed, as evidenced by the fact that monitoring wells that were once upgradient are now downgradient and vice versa.

2. Well WT8, which had approximately 8 feet of water in 1983, had become dry by May of 1987.

3. Well WT7, which had over 10 feet of water in it in 1983, had become dry by January of 1988.

4. The floor of the McGowan quarry is 20 feet above the water table.

5. The Prairie du Chien aquifer is partially recharged under the McGowan property, near the Minnesota River.

As stated in Section 13, as long as the Kraemer quarry remains in operation and dewatered, the amphitheater development will have no impact on ground water. In the distant future, once the Kraemer quarry is abandoned and allowed to fill with water, groundwater wells and pumping will be required to keep the amphitheater dry. As this will be a continuous and full time operation, groundwater levels around the site will be lowered. When and how much is not known at this time, but it will likely be to a lesser extent than current ground water lowering caused by the Kraemer operation.

Depth to Bedrock

Geologic cross sections are included in Section 16. As these figures show, the depth to bedrock ranges from 20 to 51 feet below the surface on the northern end of the site and from 3 to 19 feet below the surface near the southern property line. As previously noted, this bedrock consists of the Prairie du Chien Group of dolomites and it ranges in thickness from 75 feet to 120 feet.

b. Describe the soils on the site, giving NRCS (SCS) classifications, if known. Discuss soil granularity and potential for groundwater contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.

Figure 19.1 illustrates the portion of the Soil Survey of Dakota County that includes the McGowan Property. Unfortunately, this mapping was conducted between 1974

and 1979, and the Subject Property has been substantially altered since then. The vast majority of the property has been filled with solid waste and covered with soil, in accordance with accepted practices. Another portion of the site has been mined since this mapping was performed.

A brief description of the soils that are illustrated on Figure 19.3 is presented below. It is clear, however, that virtually the entire site has been altered through land filling and limestone mining activities, since this survey was prepared.

Oshawa Silty Clay Loam

The Oshawa series consists of deep, very poorly drained soils on flood plains of major rivers. They are moderately slowly permeable. These soils formed in silty alluvium. Slopes range from 0 to 1 percent.

The Oshawa soils are similar to the Colo and Kalmarville Soils. They are commonly adjacent to the higher, moderately well drained Minneiska soils and to the Seelyeville soils, which are made up of organic material. The Colo soils do not have carbonates. The Kalmarville soils are underlain by sandy material.

Faxon Silty Clay Loam

The Faxon series consists of moderately deep, poorly drained and very poorly drained soils on terraces of flood plains. These soils are moderately permeable. They formed in silty to clayey alluvium underlain by limestone bedrock. Slopes range from 0 to 2 percent.

The Faxon soils in Dakota County have dark surface colors that extend below a depth of 24 inches and a higher clay content in the solum than is defined as the range for the series. These differences do not alter the usefulness or behavior of the soils.

The Faxon soils are similar in position and commonly adjacent to the Oshawa and Seelyeville soils. The Oshawa soils are deep to bedrock. The Seelyeville soils formed in highly decomposed organic material.

Minneiska Loam, Occasionally Flooded

The Minneiska series consists of deep, moderately well drained soils on flood plains of major rivers. They are moderately rapidly permeable. These soils formed in recent stratified loamy alluvium. Slopes range from 0 to 2 percent.

The Minneiska soils are similar to the Lawson soils and are commonly adjacent to the lower Colo soils that have a thick, black surface horizon and to the lower, very poorly drained Oshawa soils. The Lawson soils formed mostly in silt loam

material that is not stratified.

Seelyeville Muck

The Seelyeville series consists of deep, very poorly drained soils along major flood plains and in upland depressions. They have moderately rapid permeability. These soils formed in highly decomposed organic material more than 51 inches thick. Slopes range from 0 to 2 percent.

The Seelyeville soils are similar to the Boots, Palms, and Rondeau soils and are commonly adjacent to them. All these soils are in similar positions on the landscape. The Boots soils have hemic material dominant in the control section, the Palms soils have mineral material above 51 inches, and the Rondeau soils have marl layers within 51 inches of the surface.

Udorthents, Wet

This map unit consists of heterogeneous, earthy fill material and industrial waste that has been placed on poorly drained and very poorly drained mineral or organic soils. It provides sites for buildings, roads, recreation areas, and other uses. Areas are irregular in shape and range from about 2 to 80 acres.

The fill material is 2 feet or more thick. It is a mixture of organic and inorganic waste and sandy, gravelly, loamy, and silty soil material. Earthy soil material makes up about 80 percent of the unit. The other 20 percent are nonsoil material, such as bricks, trash, wire, metal, boards, and pieces of concrete and stones. Small areas of soils that have not been significantly altered by filling or covering make up a small percentage of this map unit.

Udorthents, moderately shallow

This map unit consists of areas of an active sanitary landfill where solid waste is covered daily. Some of these areas filled with soil and waste material are higher in elevation than the adjacent soils.

The surface varies from nearly level in some of the filled areas to moderately steep in areas being filled. The site to be filled changes enough each day that the entire area gradually becomes higher in elevation.

The final soil cover is thick enough to support plants. It is dark or moderately dark, alkaline or calcareous material. The active part of the area consists of refuse of variable texture, concrete fragments, construction materials, and other waste that is dumped and smoothed out.

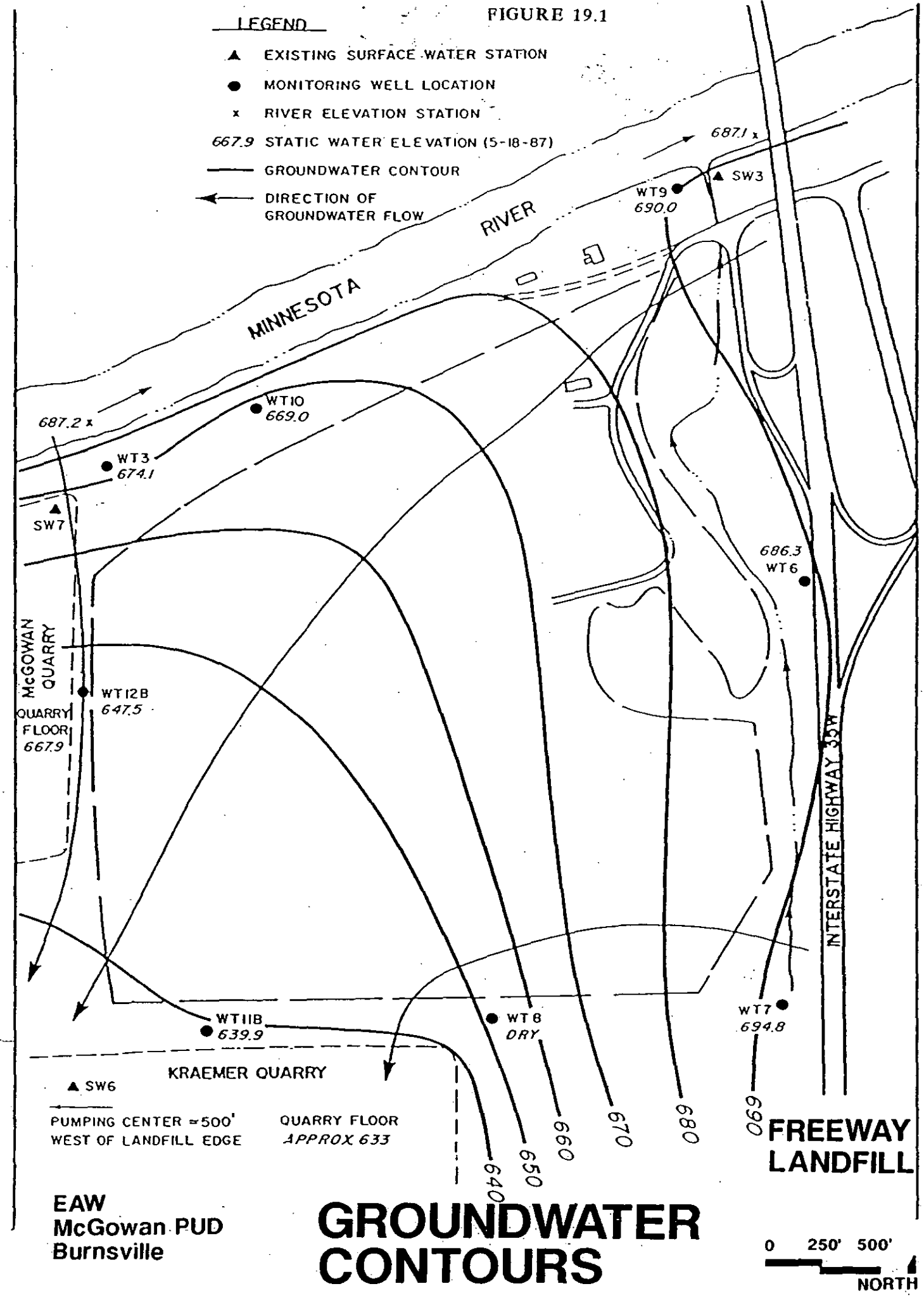
TABLE 19A

GROUNDWATER ELEVATIONS

Well No.	Top of Casing Elevation	Well Bottom Elevation	Groundwater Elevations						
			5/18/87	6/11/87	8/6/87	9/24/87	10/9/87	11/27/87	1/12/88
WT-3	706.66	673.50	674.12	674.83	675.81	675.47	675.43	674.85	674.43
WT-6	700.40	680.40	686.25	685.94	694.05	687.87	687.79	685.55	684.57
WT-7	703.49	686.60	694.76	690.91	696.25	688.96	688.90	Dry	Dry
WT-8	706.67	677.00	Dry	Dry	Dry	682.38	682.40	Dry	Dry
WT-9	703.94	635.73	690.02	689.71	692.46	691.47	691.45	691.33	691.95
WT-10	707.77	655.65	668.97	669.57	671.11	669.94	669.88	669.63	667.95
WT-11B	718.12	605.72	639.94	639.93	639.92	639.77	639.76	639.67	639.66
WT-12B	712.08	615.21	647.49	647.61	649.84	646.68	646.62	646.04	644.68

NOTE: All elevations are feet AMSL.

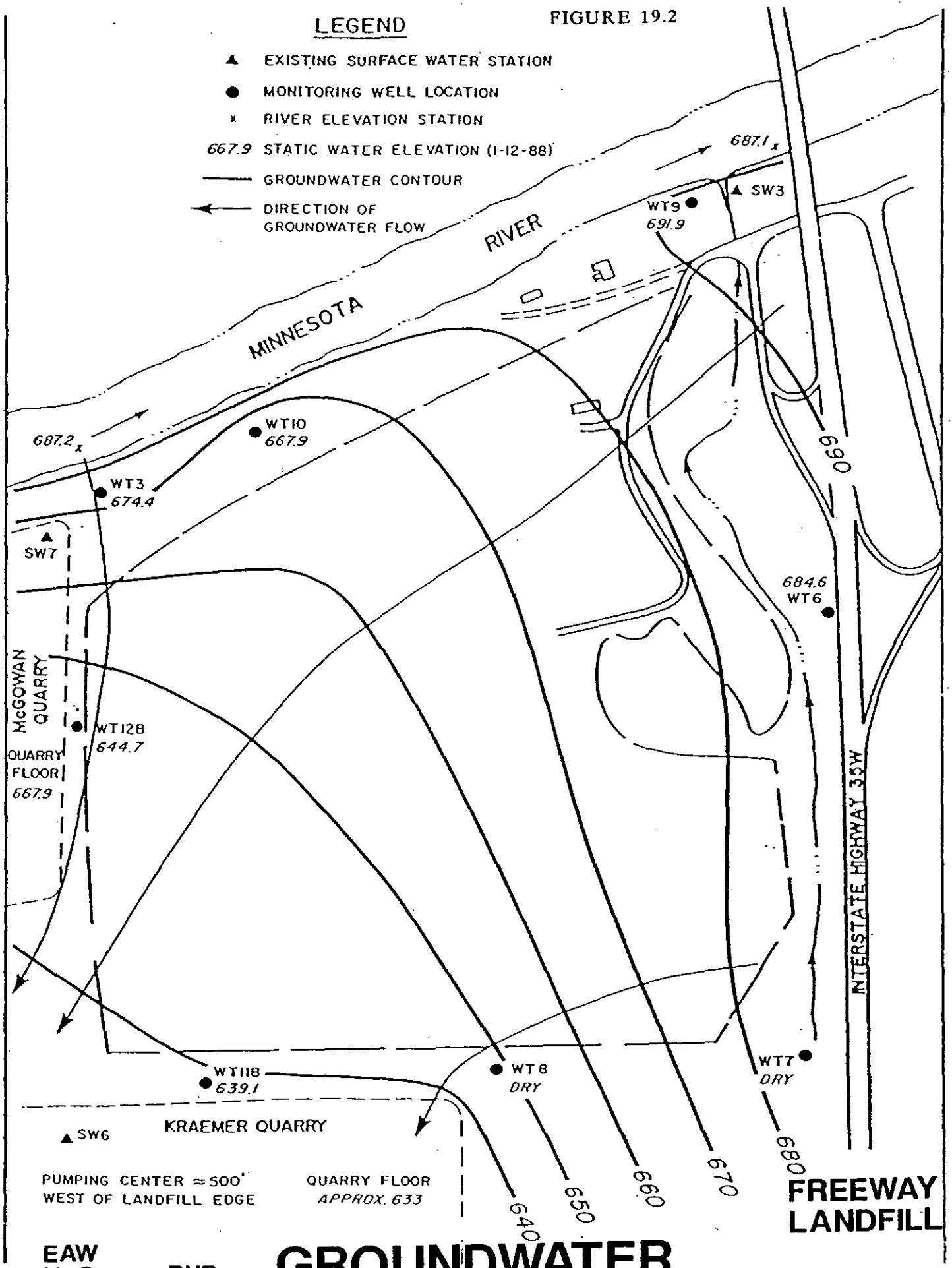
FIGURE 19.1



EAW
McGowan PUD
Burnsville

GROUNDWATER CONTOURS

FIGURE 19.2

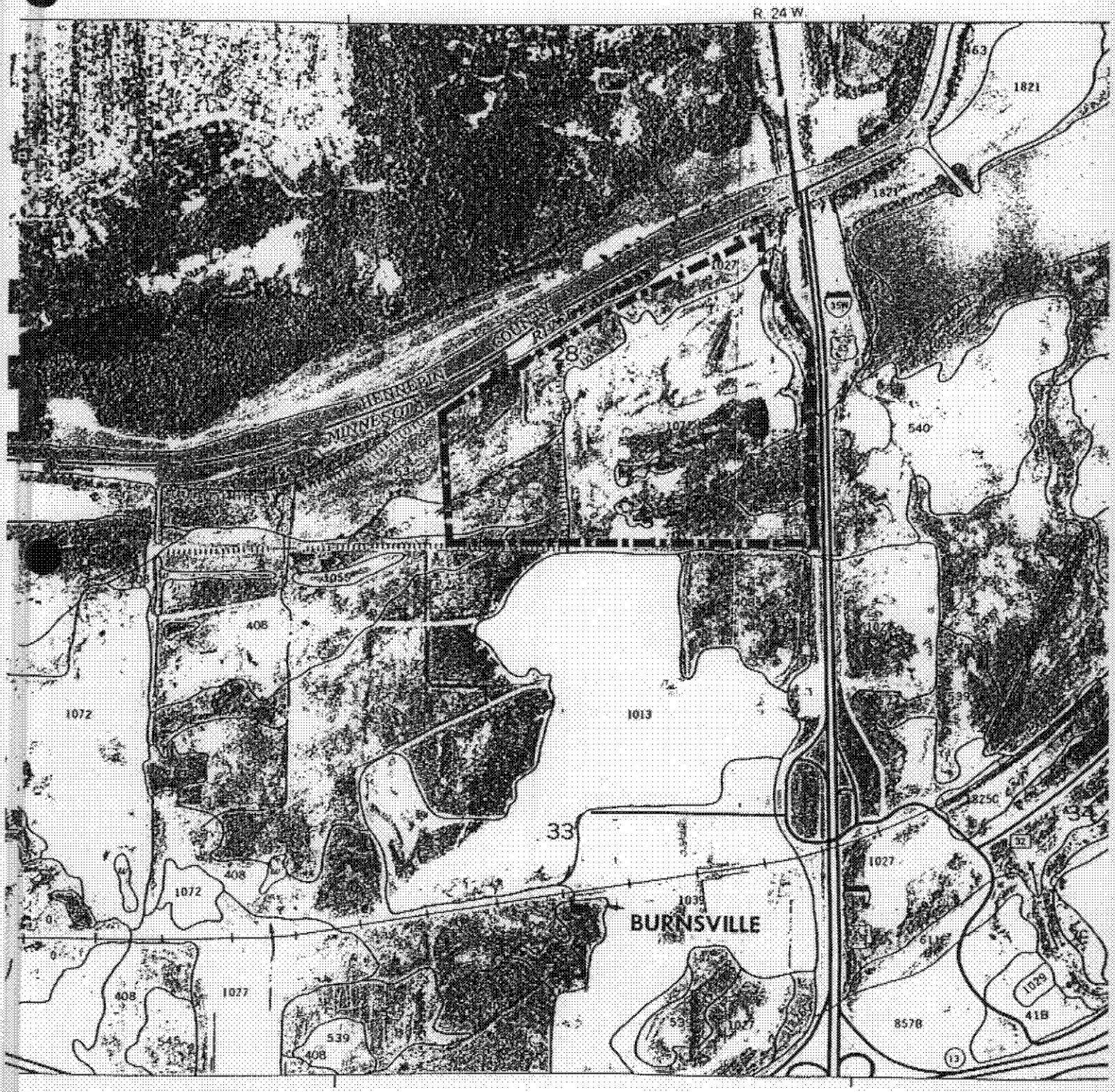


EAW
McGowan PUD
Burnsville

GROUNDWATER CONTOURS

Poor Quality

FIGURE 19.3



317 - OSHAWA SILTY CLAY LOAM
408 - FAXON SILTY CLAY LOAM
463 - MINNEISKA LOAM, OCCASIONLLY FLOODED
540 - SEELYEVILLE MUCK
1027 - UDORTHENTS, WET
1072 - UDORTHENTS, MODERATELY SHALLOW

EAW
McGowan PUD
Burnsville

SOILS

0 600' 1200'

NORTH

20. Solid wastes, hazardous wastes, storage tanks

a. Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.

b. Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating groundwater. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.

c. Indicate the number, location, size and use of any above or below ground tanks to store petroleum products or other materials, except water. Describe any emergency response containment plans.

Most landfills that have accepted mixed municipal solid waste contain various amounts of hazardous compounds and asbestos-containing waste. It is possible that these types of materials could be encountered during the process of waste removal in the flood plain, interchange, south utility corridor, and west boundary geomembrane installation described in part 6b. This material could also be encountered during the final cover grading or gas extraction system pipe installation. The MPCA will contract with a construction contractor to perform the above-mentioned work. The construction contract will require the contractor to stop work if suspected hazardous material is encountered. This is to protect both the construction worker and the general public from exposure to an uncontrolled release of the material. If the material is suspected to be hazardous, MPCA will call in a hazardous materials contractor to sample and analyze the material. Based on the results of the analysis, a plan will be developed to determine how and where the waste encountered will be handled. The waste may still be relocated in the landfill, or it may need to be contained and transported off-site to a licensed hazardous waste disposal facility. If asbestos-containing material is encountered, the contractor will be required to immediately cover the waste. A pit will need to be dug in the waste pile to receive the asbestos waste. Then the asbestos waste can be excavated again, with a spray of water being applied to prevent the material from becoming airborne. After the asbestos waste has been relocated to the prepared pit, the waste must be immediately covered. The location of the buried asbestos waste must be surveyed to record the precise location of its burial so future excavation in the landfill, if necessary, can avoid this area.

Based upon the experiences of operators of similar amphitheater facilities throughout the country, it is estimated that between 30 and 40 cubic yards of uncompacted solid waste will be generated during maximum capacity events. Sell-out events are only anticipated to occur four to six times per season. The handling of solid waste was fully addressed as part of the Planned Unit Development process. The PUD was approved including a waste transfer station to be uniquely equipped to deal with this issue. The transfer station has already designed and built to accommodate this waste.

21. **Traffic.** Parking spaces added 6,300. Existing spaces (if project involves expansion) 0 . Estimated total daily traffic generated 11,560 vehicles (design event) or 13,930 vehicles (maximum). Estimated peak hour traffic generated (if known) and time of occurrence see below . Provide an estimate of the impact on traffic congestion on affected roads and describe any traffic improvements necessary. If the project is within the Twin Cities metropolitan area, discuss its impact on the regional transportation system.

The project requires a new Indirect Source Permit (ISP). The original ISP (90-3) for the project has expired. An ISP is required since the 6,300 parking spaces proposed for the project exceed the parking space threshold requirement needed for an ISP.

The proposed amphitheater is planned to have a seating capacity of 19,500. The design event for the amphitheater, which is expected to occur four to six times a year, is 16,200 patrons (83% of capacity). An event of this size will generate approximately 3,470 vehicle trips in the peak hour of arrival of an event and 5,200 vehicle trips in the peak hour of departure of an event.

The proposed amphitheater site is planned to include 6,300 total parking spaces, which will include both paved and non-paved parking. There are no parking spaces currently on the site. Gates to the parking areas will be opened two hours before an event. There will be a charge for parking at the gate. The amphitheater site design will include a minimum of six lanes of queuing for parking for each lane of traffic entering the site.

A Traffic Impact Analysis was previously completed for the amphitheater development in 1989 using the same site characteristics that are currently being proposed. The traffic analysis has been updated considering revised design assumptions, recent improvements to the overall transportation system in the project area (additional lane on I-35W, TH 169 bridge over the Minnesota River, Cliff Road improvements, etc.) and the increase in background traffic volumes over the past 10 years. The Amphitheater Traffic Impact Analysis is included in its entirety at the end of this section.

The update of the Traffic Impact Analysis indicates that the transportation system in the project area has adequate capacity to support the amphitheater development assuming that the following requirements are met.

Supporting Roadway System Improvements

The existing roadway system in the project area is not adequate to support the proposed amphitheater development. The project, therefore, includes a number of traffic/transportation improvements to accommodate event traffic. These

improvements include the following:

- Modifications to the southbound I-35W entrance/exit ramps at the Black Dog Road interchange.
- The extension of Embassy Road from Cliff Road to the Black Dog Road interchange. The roadway must have adequate width to support four lanes of traffic during events.
- Relocation of the Cliff Road and Embassy Road intersection approximately 300 feet west.
- Widen Cliff Road from the I-35W west ramp/loop to Dupont Avenue to four lanes.
- Extend Cliff Road to the west and south to connect to County Road 5 at the Trunk Highway 13 intersection.
- Construct a second left turn lane for eastbound TH 13 at the County Road 5 intersection.

All of these improvements are currently being proposed as a part of the amphitheater development.

The existing roadway system in the project area is illustrated on Figure 21.1. Figure 21.2 illustrates the proposed roadway system including the improvements detailed above.

Amphitheater Traffic Management Plan

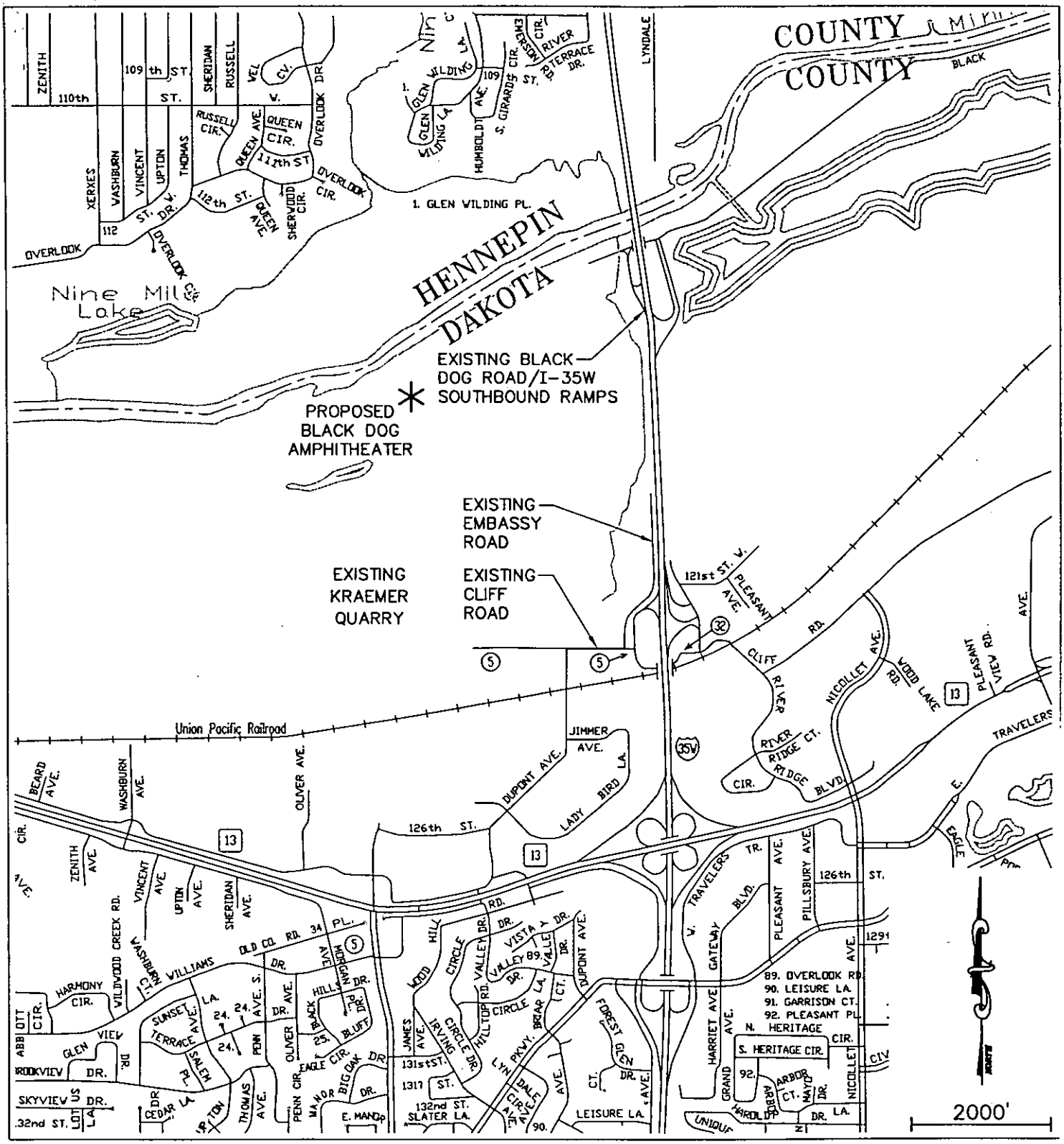
A traffic management plan must be established for arrival and departure traffic for amphitheater events. The plan must include traffic control personnel stationed at key intersections in the project area to direct traffic during peak arrival and departure periods. The plan must also direct traffic to all of the access routes available to the amphitheater site to ease congestion at any of the individual access points. A traffic management plan will be established by the project proposer to address these issues.

Transit service to the amphitheater site will also be provided during major events as a part of the traffic management plan. Park and ride promotions are proposed using the existing Minnesota Valley Transit Authority (MVTA) Transit Hub located on Nicollet Avenue at TH 13. Direct access to the amphitheater site from the Transit Hub is available using Nicollet Avenue and Cliff Road without traveling along I-35W.

The traffic management plan also includes a charge for parking at the amphitheater site. This will encourage carpooling and reduce the number of single occupancy vehicles accessing the site.

Event Times

Major amphitheater events (events with attendance greater than 10,000 people) should not start until 8:00 PM on weekdays to avoid peak traffic periods on I-35W. Smaller weekday events and events on weekends may start earlier; however, no weekday events should start before 7:00 PM. No operating restrictions should be required during typical weekends.



CITY OF BURNSVILLE

EXISTING ROADWAY SYSTEM
BLACK DOG AMPHITHEATER
BURNSVILLE, MINNESOTA

BRW
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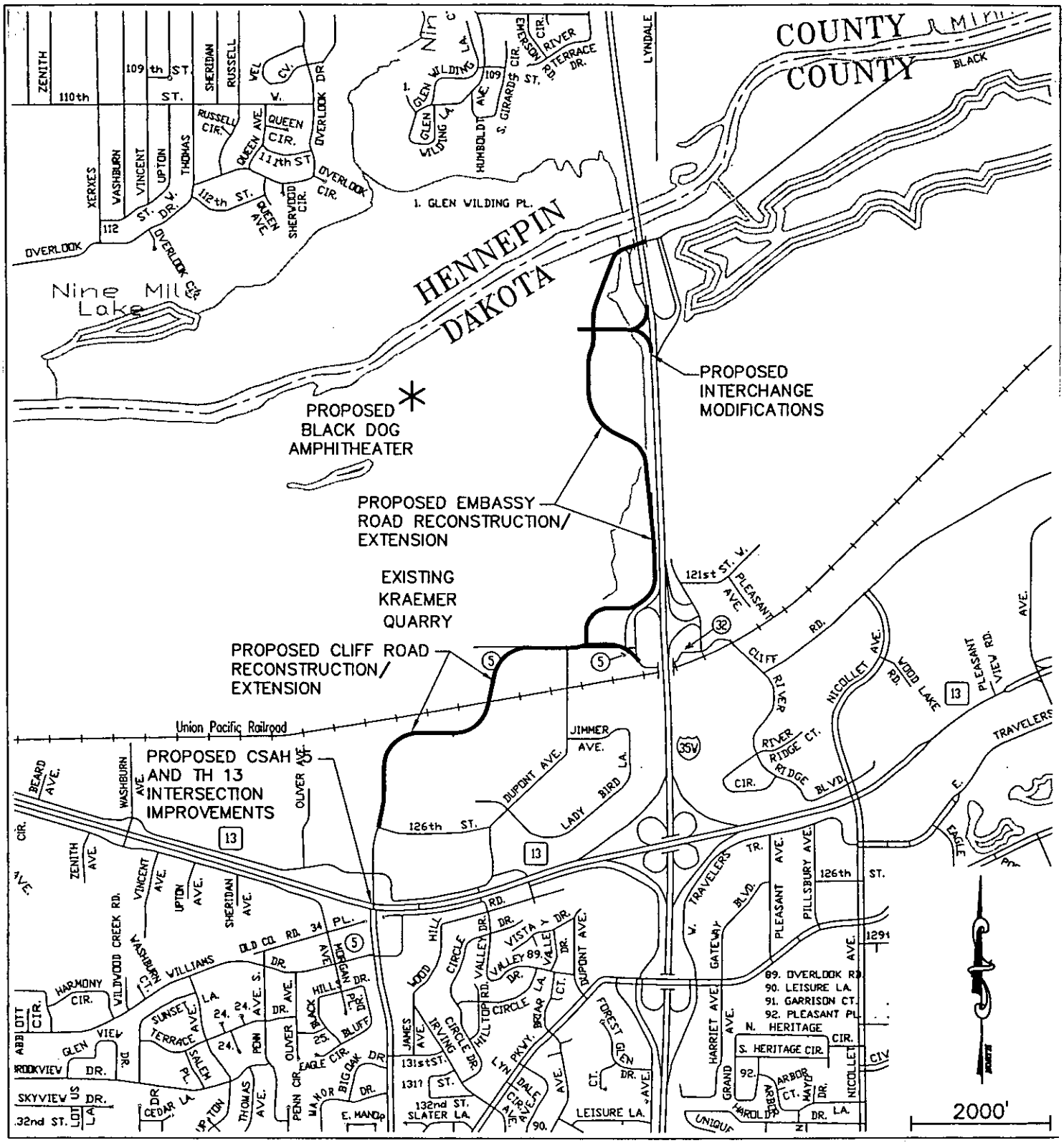
FIGURE 21.1



CITY OF BURNSVILLE

PROPOSED ROADWAY SYSTEM
BLACK DOG AMPHITHEATER
BURNSVILLE, MINNESOTA

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FIGURE 21.2

BRW
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MEMORANDUM

BRW
Transportation Division
Corporate Office
700 Third Street South
Minneapolis, MN 55415
612 370 0700 Tel
612 373 6525 Fax

To: Jon Horn **Copy:** **File:** 33916 001 5007

From: Howard Preston, PE
Ted Schoenecker, EIT

Date: January 11, 2000

Subject: Burnsville Amphitheater Traffic Impact Study

A traffic impact analysis was conducted for the proposed construction of an Amphitheater in the vicinity of I-35W and Black Dog Road. The purpose of the analysis was to identify and evaluate potential traffic impacts associated with the proposed development, and to identify possible strategies for mitigating potential problems.

The Burnsville Amphitheater traffic impact analysis included the following elements:

- Existing Conditions
- Year 2001 Conditions - Expected year of opening of the amphitheater
- Directional Orientation
- Trip Generation
- Directional Distribution of arriving and departing vehicles
- Intersections Level of Service (LOS)
- I-35W Freeway Capacity
- Conclusions and Possible Mitigations

A list of initial assumptions, a summary of the analysis, and the conclusions are included below.

INITIAL ASSUMPTIONS

1. Attendance

   - Maximum Attendance: 19,500 (Source: City of Burnsville)
   - Design Attendance: 16,200 - 83% of capacity (Source: MnDOT e-mail dated December 28, 1999)

2. Hours of Analysis

   - Peak Arrival Hour: 7 PM to 8PM (Based on an 8:00 PM event starting time)
   - Peak Departure Hour: 10:30 PM to 11:30 PM (10 PM to 11 PM was used for the analysis)

3. Peak Hour Fraction

   - Peak Arrival Hour: 60% (Various sources)
   - Peak Departure Hour: 90% (Various sources)

4. Travel Characteristics

   - Average Vehicle Occupancy: 2.8 attendees per vehicle (Source: MnDOT e-mail dated December 28, 1999)
   - Pedestrian Split: 0%
   - Transit Split: 0% (Bus Transit may be available as a potential mitigation)

5. Traffic Generation

   - Design Attendance (16,200) / attendees per vehicle (2.8) = 5,780 vehicles

6. Direction Orientation (Source: BRW, Inc. based on population density and anticipated travel patterns). See Figure 1.

   - I-35W (From North) 54%
   - I-35W (From South) 4%
   - CSAH 5 (From South) 1%
   - TH 13 (From West) 19%
   - Cliff Rd (From East) 22%

   Direction Orientation Assumptions:

   1. All vehicles coming from the north and south on I-35W exit at Black Dog Road.
   2. All vehicles coming from the west on TH 13 turn left at CSAH 5.
   3. All vehicles coming from the east use Cliff Road.

7. Supporting Roadway System Improvements

This analysis assumes that all of the following supporting roadway system improvements have been completed to accommodate event traffic.

- Modifications to the southbound I-35W entrance/exit ramps at the Black Dog Road interchange.
- The extension of Embassy Road from Cliff Road to the Black Dog Road interchange. The roadway will have adequate width to support four lanes of traffic during events.
- Relocation of the Cliff Road and Embassy Road intersection approximately 300 feet west.
- Widen Cliff Road from the I-35W West Ramp/Loop to Dupont Avenue to four lanes.
- Extend Cliff Road to the west and south to connect to County Road 5 at the TH 13 intersection.

ANALYSIS

1. Intersections Analyzed (See Figure 2 street names and locations)

- Embassy Road / North Amphitheater Access / I-35W West Ramp
- Embassy Road / South Amphitheater Access
- Cliff Road / Embassy Road
- Cliff Road / I-35W West Ramp
- Cliff Road / I-35W East Ramp
- TH 13 / CSAH 5

Intersection Analysis Assumptions

1. All intersections, except Black Dog Road / I-35W East Ramp and TH 13 / CSAH 5, will have traffic control personnel during events at the amphitheater.

2. Only the TH 13 / CSAH 5 intersection is signalized. The other intersections are assumed to be STOP sign controlled.

3. Because traffic control personnel would be at each of the major intersections, it was assumed that the intersections would operate similar to a signalized intersection. Therefore, all intersections were analyzed as signalized intersections.

The existing (1999) and forecast year 2001 geometry is shown in Figures 2 and 3. Figures 4 – 7 show the existing (1999) PM peak hour volumes, forecast year 2001 PM peak hour volumes, forecast year 2001 peak arrival hour volumes, and forecast year 2001 peak departure hour volumes.

..section and Roadway Geometry

- The intersection and roadway geometry at the North and South Amphitheater Access intersections and at the Cliff Road / Embassy Road intersection will likely be different during the peak arrival and departure periods. (For example, Embassy Road could operate as three lanes inbound during the arrival period and three lanes outbound during the departure period.)

- The site access will be designed to provide a reversible operation with multiple lanes inbound during the arrival period and then multiple lanes outbound during the departure period.

3. Intersection Level of Service (LOS)

- The intersection of TH 13 / CSAH 5 is expected to operate as a LOS F during the PM Peak Hour in the Forecast Year 2001 without the additional arriving traffic due to the construction of the amphitheater. However, the assumed peak hour for vehicles arriving at the amphitheater is from 7:00 PM to 8:00 PM. If no traffic were added to the left turn lane due to the amphitheater, the intersection would operate at a LOS C. With the addition of the arriving traffic (approximately 650 vehicles) during the peak hour arrival time, the intersection would operate at a LOS F.

- During the departing peak hour, two intersections operate at a LOS E: Embassy Road / North Amphitheater Access and TH 13 / CSAH 5.

  For the Embassy Road / North Amphitheater Access intersection, the controlling movement is the eastbound to northbound left turn (LOS E). It was assumed that all vehicles (approximately 2,800) that would go north on I-35W upon departure from the event would use this route. The ramp to enter onto I-35W northbound has a capacity of 1,900 vehicles per hour (VPH). Therefore, there are approximately 900 vehicles (2,800 actual – 1,900 capacity) that will have to be rerouted to travel south on Embassy Road and access I-35W northbound from Cliff Road.

  For the TH 13 / CSAH 5 intersection, the controlling movement is the southbound to westbound right turn (LOS F). There are approximately 1,025 vehicles that are departing from the event at the amphitheater and would use this route.

- All other intersections, during the arriving and departing peak periods, operate at a LOS C or better.

Table 1 shows a summary of the different time periods that were analyzed.

4. I-35W Capacity Analysis

- The assumed capacity on I-35W Southbound before 6:00 PM is 5,300 VPH. (Source:

MnDOT Traffic Management Center)

- The assumed capacity on I-35W southbound after 6:00 PM is 6,600 VPH. (*The difference in the capacities is due to the Diamond Lane restriction that is in effect between 3 PM and 6 PM*). (Source: MnDOT Traffic Management Center)

- The forecast year 2001 hourly traffic southbound on I-35W during the Peak Hour Arrival time (7PM – 8PM) is approximately 3,200 vehicles. Therefore, there is a reserve capacity of 3,400 (6,600 capacity – 3,200 actual) vehicles that can be added to the roadway before the capacity of the roadway is met or exceeded.

- The assumed capacity for the diverge/exit ramp to the amphitheater is 1,900 VPH (Source: MnDOT Traffic Management Center). During the Peak Hour Arrival time, there will be approximately 1,900 vehicles entering the site from this ramp. Therefore, the ramp will be at or near capacity.

Figures 8 and 9 show the weekday and weekend average hourly traffic and capacity on I-35W southbound north of the Minnesota River Bridge.

CONCLUSIONS

- Major events should begin at or after 8:00 PM so that peak hour of vehicles arriving at the event will be after the typical PM peak hour on I-35W.

- At the TH 13 / CSAH 5 intersection, adding a second left turn lane would improve the intersection LOS from F to D during the peak arrival period for the amphitheater. Due to the fact that the east approach already has a double left turn lane design, a second left turn lane on west approach could be easily constructed.

- For the TH 13 / CSAH 5 and Embassy Road / North Amphitheater Access intersections, traffic could be diverted to other routes during the peak departure hour to ease the congestion at these intersections.

- During the peak arrival period, there is sufficient capacity on I-35W for the additional vehicles that are coming to the event. However, during this peak arrival period, the diverge/exit ramp is at or near full capacity (1,900 VPH).

- Embassy Road needs to provide four-lanes of operation during the peak arrival and departure periods.

- Traffic control personnel should be used during the peak hour of arrival and departure for the following intersections:

    1. Embassy Road / North Amphitheater Access / I-35W West Ramp

2. Embassy Road / South Amphitheater Access
3. Cliff Road / Embassy Road
4. Cliff Road / I-35W West Ramp
5. Cliff Road / I-35W East Ramp

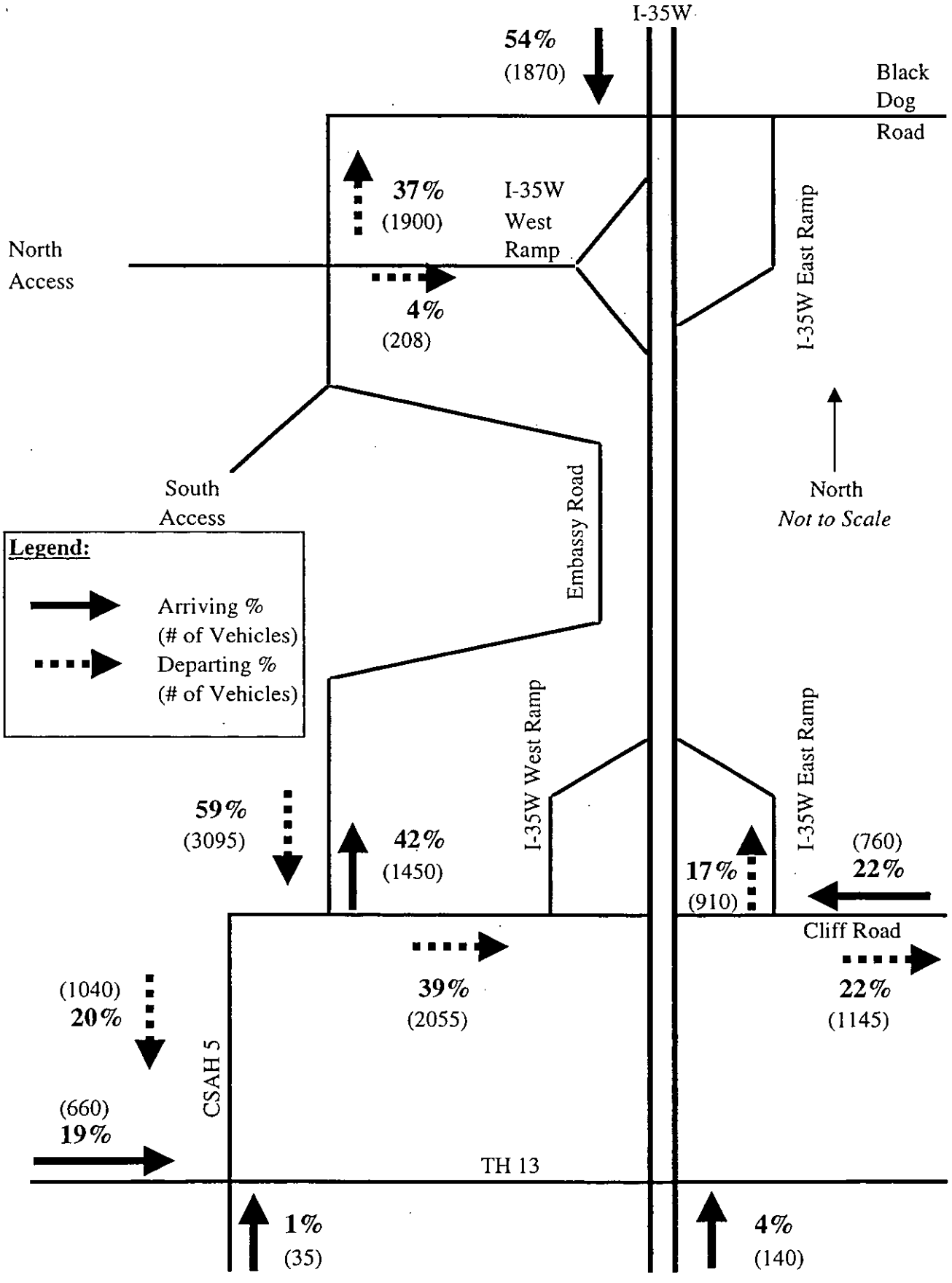
- Parking Operation – There needs to be a minimum of two entrances to the site, and assuming a pay-for-parking operation, six lanes of queuing will be needed for each entrance lane (This should result in no queuing/spillback onto southbound I-35W).

- Overall, there is sufficient capacity in the entire system. However, the capacity of some elements could be exceeded unless actions are taken to divert traffic. A Traffic Control Plan would likely be needed to address congestion at both on-site and at key off-site intersections and to effectively divert traffic.

- Changeable message signs (along NB and SB I-35W, EB TH 13, and WB Cliff Road) should be considered in order to inform motorists of general information or possible alternative routes.

- This study represents a worst-case analysis. Some of the assumptions (occupants/vehicle, design attendance level) are actually higher than what is expected. However, the assumptions that were used are consistent with MnDOT recommendations for the analysis.

- Consideration should be given to providing a park-and-ride operation using the existing transit facility on Nicollet Avenue at TH 13.



City of BURNSVILLE

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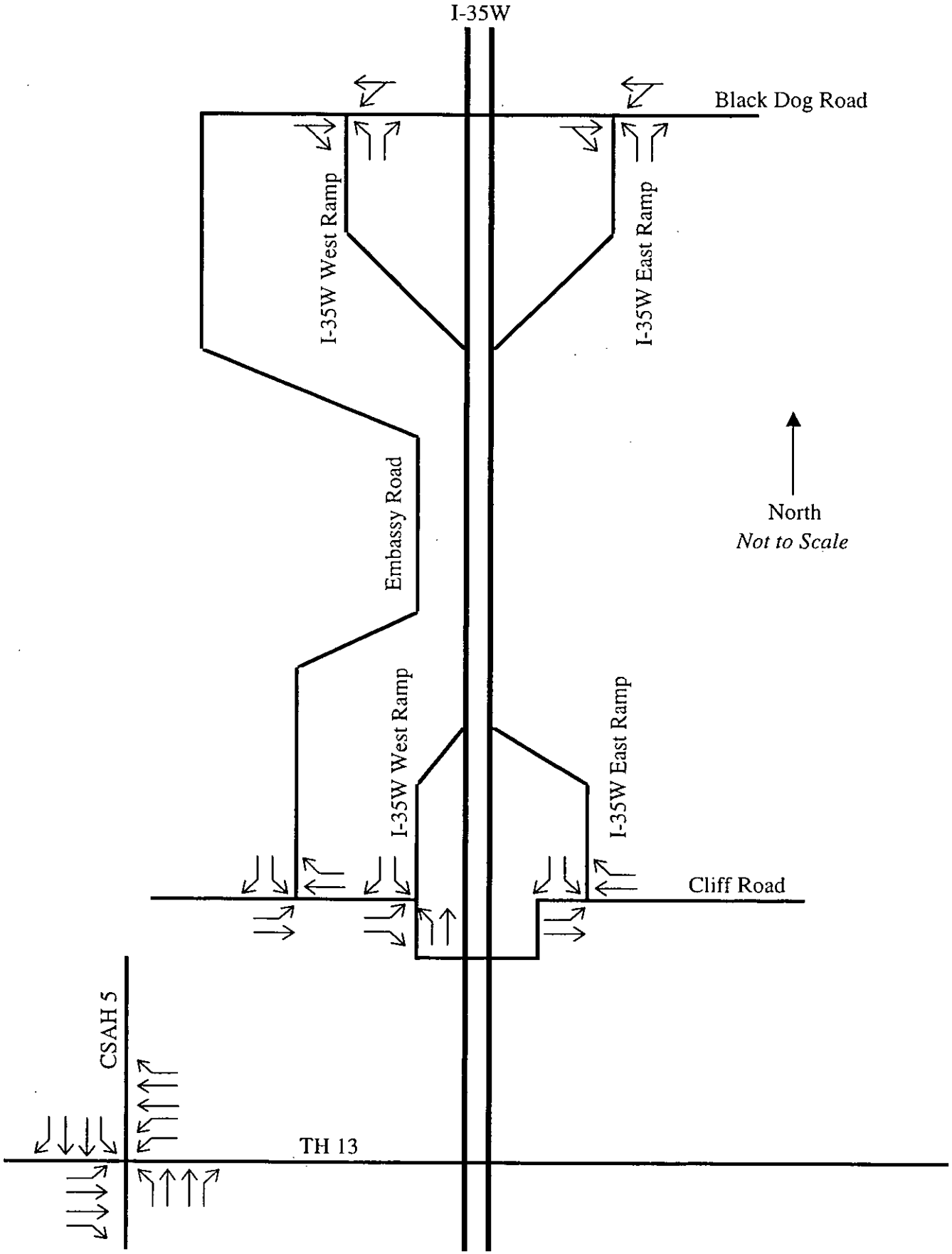
FIGURE 1
Forecast Directional Distribution



City of BURNSVILLE

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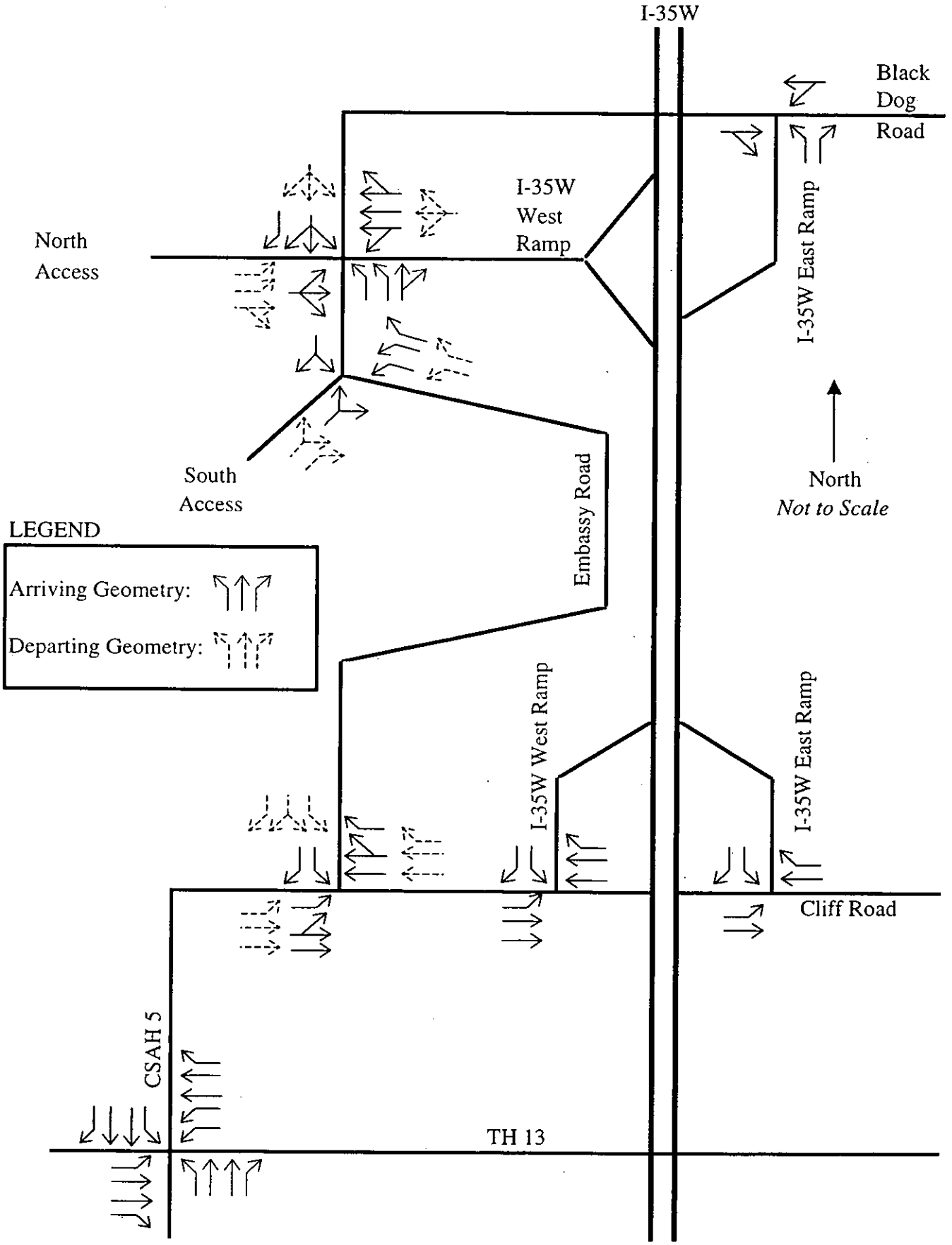
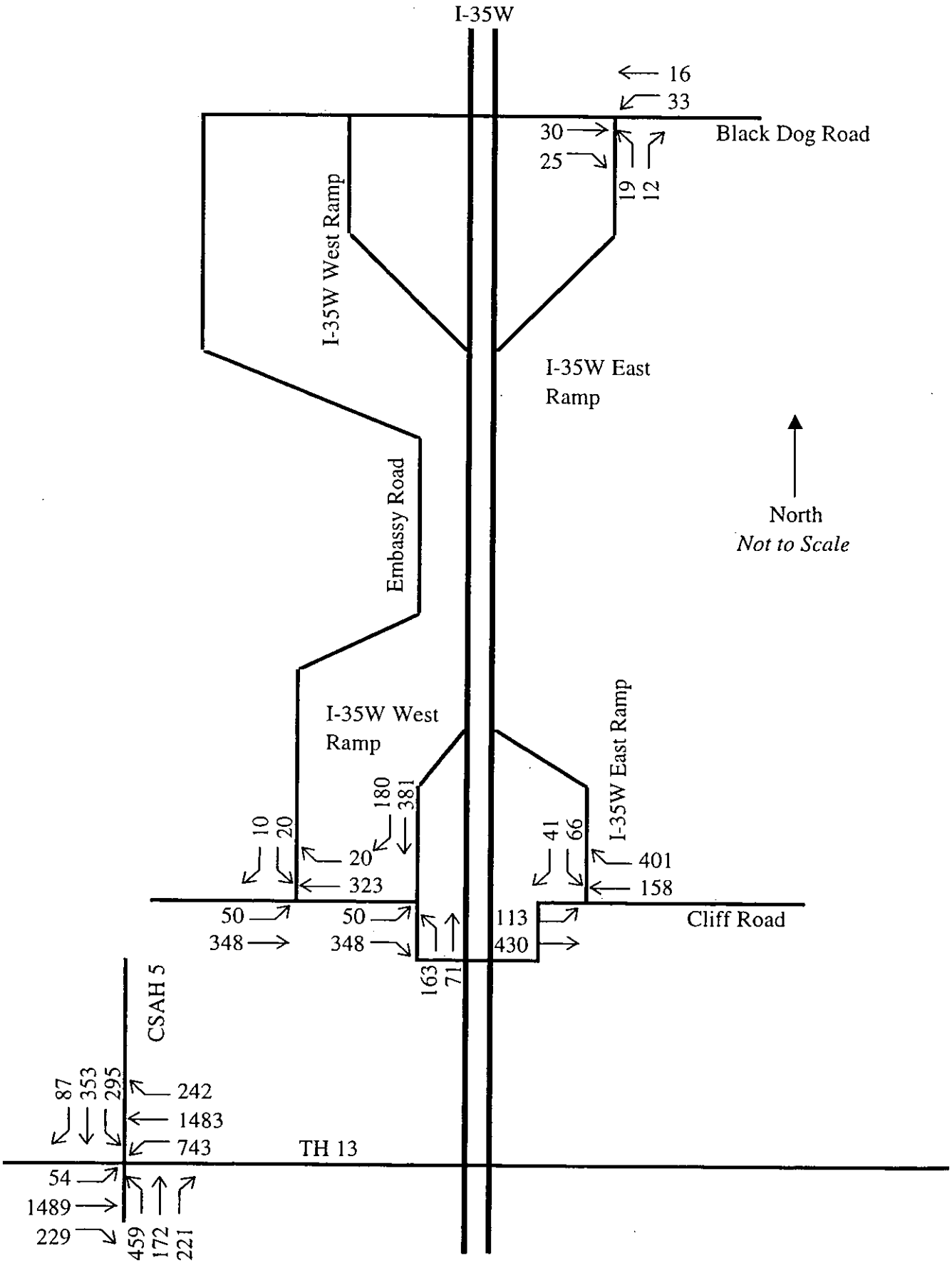
FIGURE 2
Existing Geometry (1999)



City of BURNSVILLE

DCM GROUP BRW A DAMES & MOORE GROUP COMPANY

FIGURE 3
Year 2001 Geometry
Full Build-Out



City of BURNSVILLE

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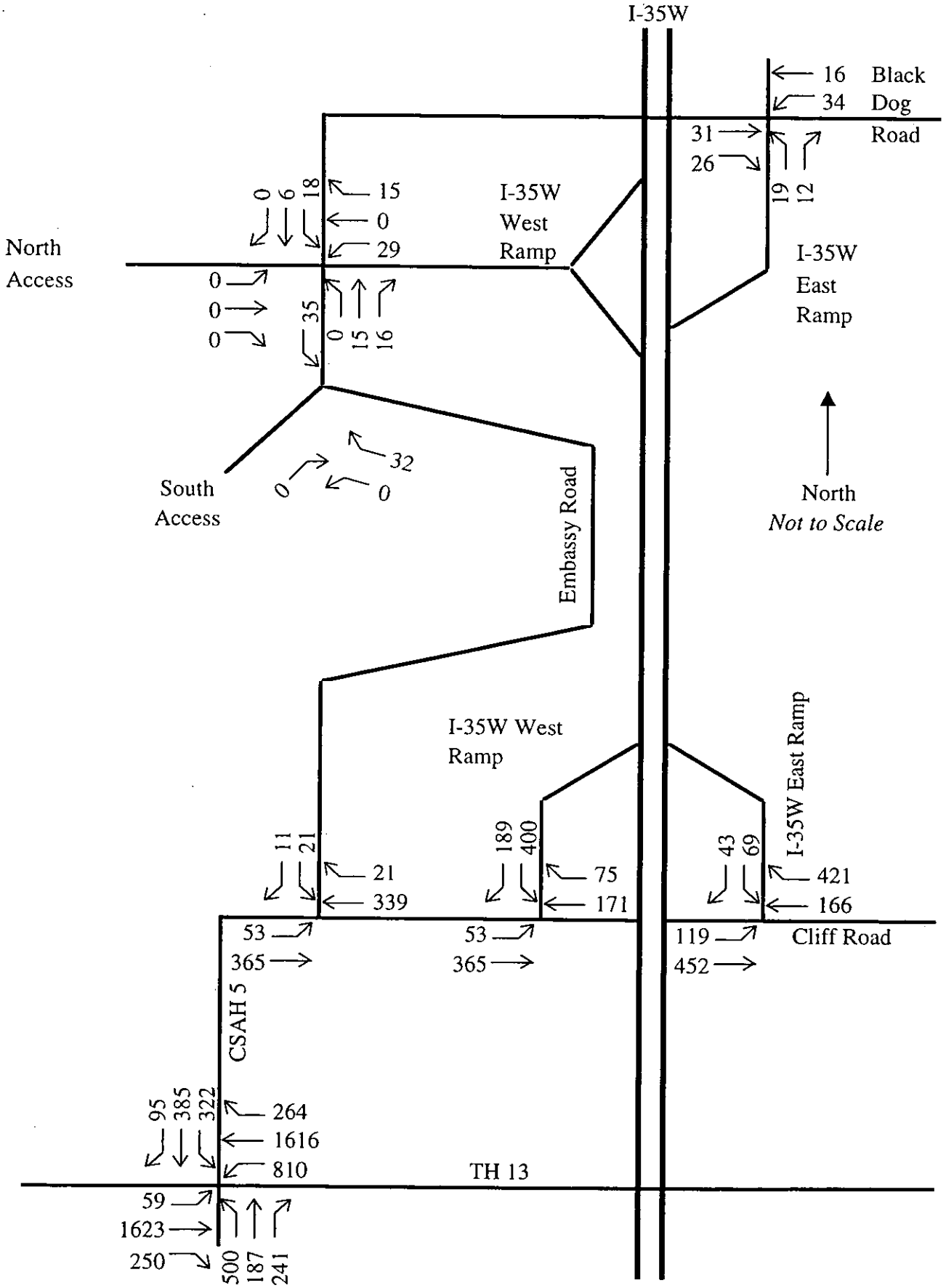
FIGURE 4
Existing PM Peak Hour Volumes



City of BURNSVILLE

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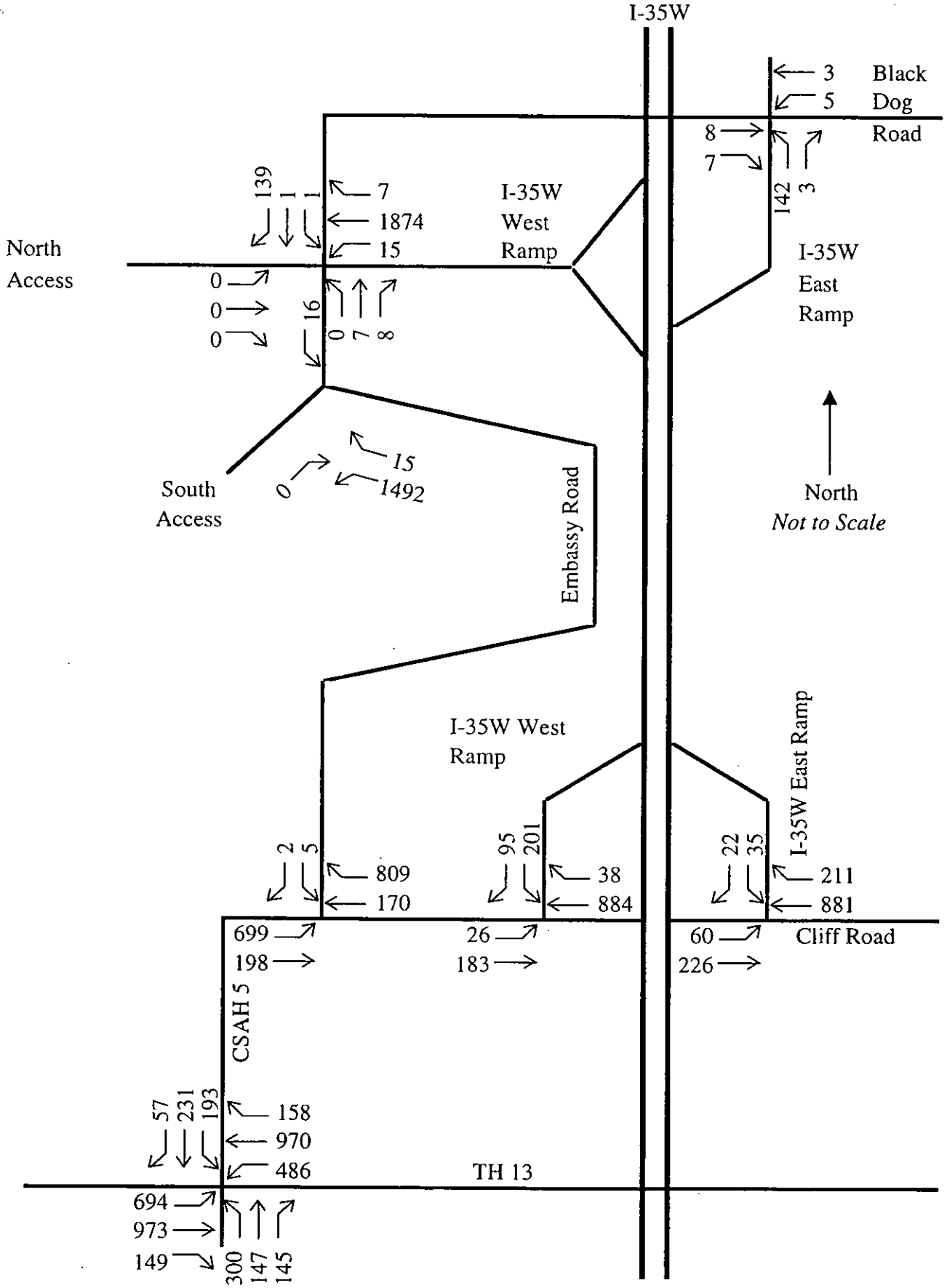
FIGURE 5
Forecast 2001 PM
Peak Hour Volumes



City of BURNSVILLE

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FIGURE 6
Forecast 2001 Peak Arrival Hour Volumes

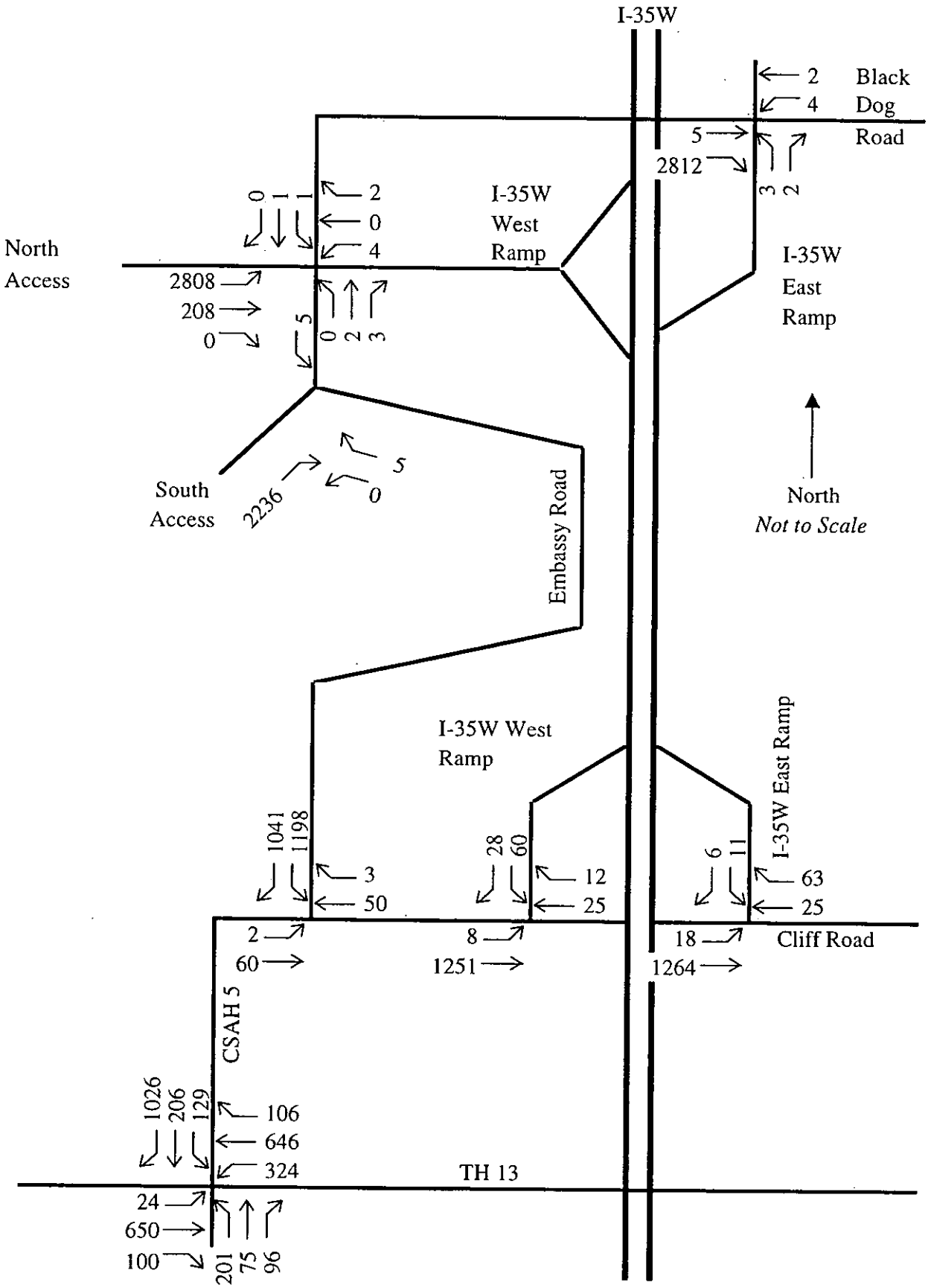

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FIGURE 7
Forecast 2001 Peak Departure Hour Volumes

TABLE 1
2001 Intersection LOS - Full Build-Out*
Burnsville Amphitheater Traffic Impact Study

INTERSECTION	TIME PERIOD	NORTH APPROACH			EAST APPROACH			SOUTH APPROACH			WEST APPROACH			INTERSECTION
		RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	LOS
Embassy Rd	2001 PM Peak Hour	--	C	--	--	A	A	--	B	--	--	--	--	B
& N. Amphitheater Access	2001 Arriving Peak Hour 1	C	C	--	--	A	--	--	B	--	--	--	--	A
	2001 Arriving Peak Hour 2	C	C	--	--	A	--	--	B	--	--	--	--	B
	2001 Departing Peak Hour	--	D	--	--	D	--	--	C	--	--	A	E	E
Embassy Rd	2001 PM Peak Hour	--	A	--	--	--	--	--	A	A	--	--	--	A
& S. Amphitheater Access	2001 Arriving Peak Hour 1	--	A	--	--	--	--	--	A	A	--	--	--	A
	2001 Arriving Peak Hour 2	--	A	--	--	--	--	--	A	A	--	--	--	A
	2001 Departing Peak Hour	--	C	--	--	--	--	--	A	--	B	--	--	B
Cliff Rd	2001 PM Peak Hour	A	--	B	A	A	--	--	--	--	--	A	A	A
& Embassy Rd	2001 Arriving Peak Hour 1	A	--	B	A	A	--	--	--	--	--	C	C	B
	2001 Arriving Peak Hour 2	A	--	C	A	A	--	--	--	--	--	C	C	B
	2001 Departing Peak Hour	A	--	C	A	C	--	--	--	--	--	C	C	A
Cliff Rd	2001 PM Peak Hour	A	--	B	A	C	--	--	--	--	--	A	C	B
& I-35W W. Ramp	2001 Arriving Peak Hour 1	A	--	B	A	C	--	--	--	--	--	A	C	B
	2001 Arriving Peak Hour 2	A	--	C	A	C	--	--	--	--	--	A	C	C
	2001 Departing Peak Hour	A	--	C	A	C	--	--	--	--	--	A	A	A
Cliff Rd	2001 PM Peak Hour	A	--	D	--	A	A	--	--	--	--	A	A	A
& I-35 W E. Ramp	2001 Arriving Peak Hour 1	A	--	D	--	A	A	--	--	--	--	A	A	A
	2001 Arriving Peak Hour 2	A	--	D	--	A	A	--	--	--	--	A	A	A
	2001 Departing Peak Hour	A	--	D	--	A	A	--	--	--	--	A	A	A
TH 13	2001 PM Peak Hour	D	E	E	A	D	F	C	E	F	B	F	F	F
& CSAH 5	2001 Arriving Peak Hour 1	C	F	D	A	F	F	C	E	F	B	F	F	F
	2001 Arriving Peak Hour 2	A	E	D	A	E	F	B	E	E	A	D	F	F
	2001 Departing Peak Hour	F	B	B	B	A	D	A	B	B	A	D	D	E

* This analysis assumed that all of the proposed supporting roadway system improvements have been completed

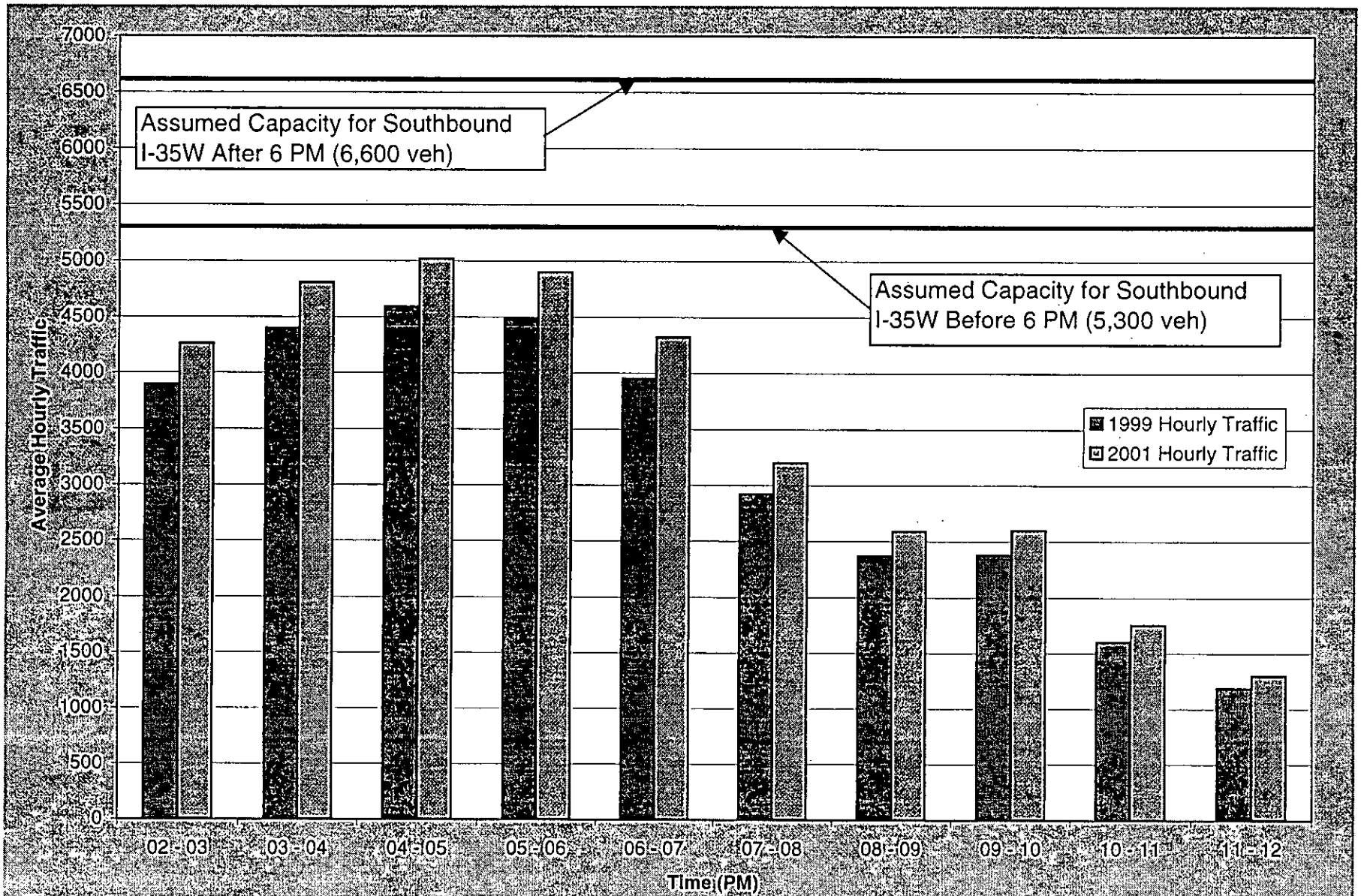


Figure 8

Weekday Average Hourly Traffic and Capacity on I-35W Southbound North of the Minnesota River Bridge

A 4.6% Growth Rate per Year was used to determine 2001

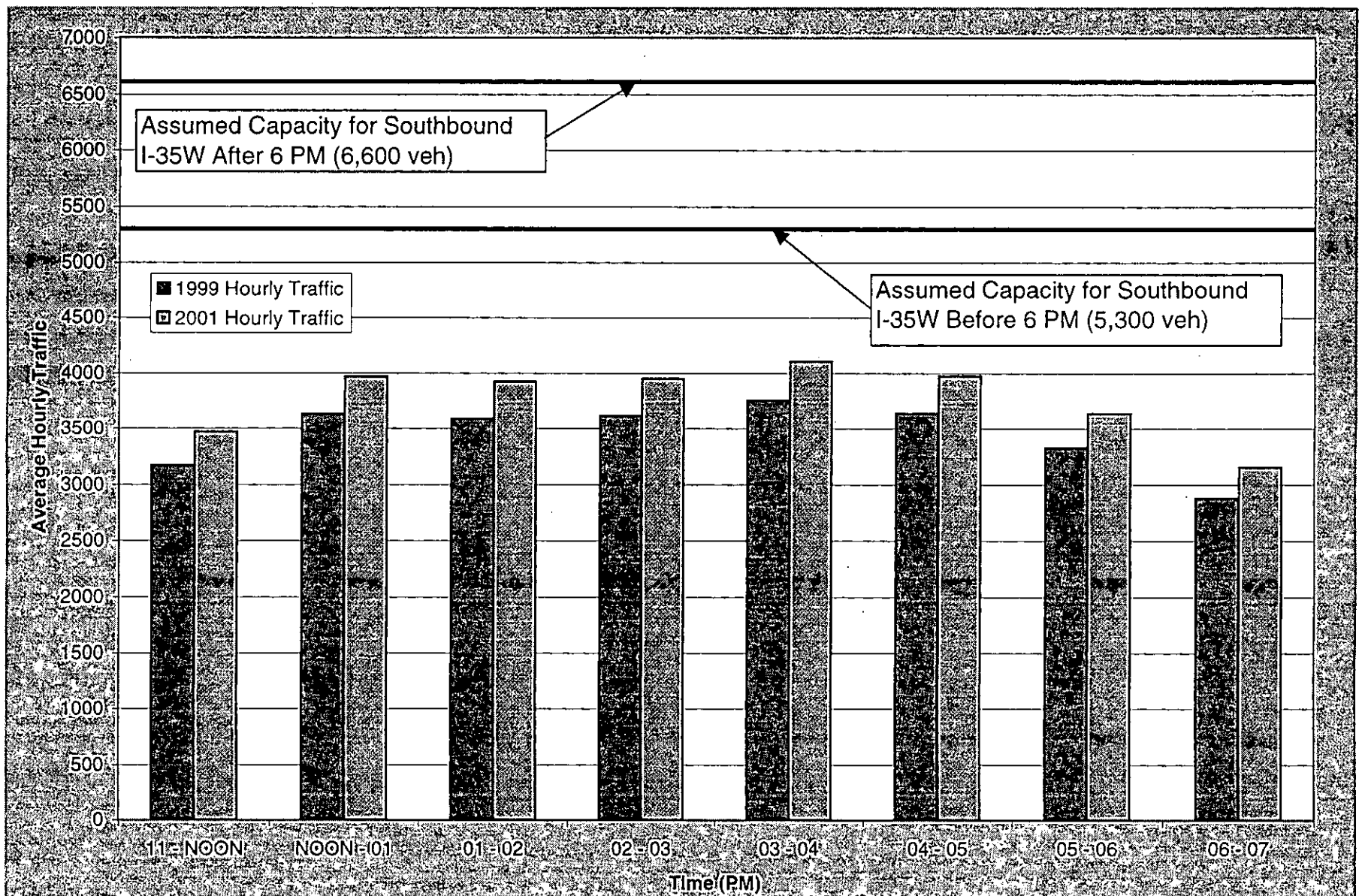


Figure 9

Weekend Average Hourly Traffic and Capacity on I-35W Southbound North of the Minnesota River Bridge

A 4.6% Growth Rate per Year was used to determine 2001

22. **Vehicle-related air emissions.** Estimate 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. Note: If the project involves 500 or more parking spaces, consult the *EAW Guidelines* about whether a detailed air quality analysis is needed.

Methodology and Assumptions

Motor vehicle air quality issues are most frequently associated with carbon monoxide (CO) emissions and the concentrations of those emissions. The methodology and assumptions for the air quality analysis were agreed to in a meeting on December 7, 1999 with MPCA staff. The carbon monoxide (CO) analysis was performed for the intersections of TH 13 at CSAH 5, and Embassy Road at the North Access (see Figure 1), because these intersections will operate at a LOS of D or worse. In addition, the intersection of Black Dog Road at the I-35W East Ramp was analyzed due to the high volume of eastbound right turns that are anticipated during an event departure hour. CO concentrations were predicted using the EPA Mobile 5A emission model and the CAL3QHC dispersion model.

The air quality impacts of the proposed amphitheater are addressed by estimating carbon monoxide (CO) concentrations at sensitive receiver sites at congested traffic areas near the project site.

The predicted CO concentrations are compared to the state ambient air quality standards for CO. The state standards are 30 ppm one-hour average and 9 ppm eight-hour average. These standards are set at levels to protect the most sensitive portions of the population and are not to be exceeded more than once per year.

The modeling assumptions used in this analysis were as follows:

Cold Start Percentage:	20.6 percent for intersection traffic
Cruise Speed:	25 mph
Analysis Year:	2002
Traffic Mix:	National default values
Wind Speed:	1 meter/second
Temperature:	20 degrees F
Surface Roughness:	108 centimeters
Stability Class:	D
Inspection Maintenance:	No
Oxygenated Fuel:	Yes
Eight Hour Persistence Factor:	0.7
Wind Direction:	36 directions at 10 degree increments

The sidewalk averaging method, recommended by the U.S. EPA, was used for the intersection of Black Dog Road at the I-35W East Ramp. In this method, the receptors are located along each sidewalk or side of the intersecting streets at approximately 10 meters and 50 meters from the edge of the intersecting roadway. The CO concentration at each of the receptors was modeled. The highest, or worst case, average CO concentrations for each receptor site was then calculated. The sidewalk averaging method results in higher predicted CO concentrations than would be expected at nearby receptors. CO concentrations diminish rapidly at greater distances from the sidewalks.

Background CO Levels

The total CO concentration at a point is the sum of CO from both local and remote sources. The local CO is estimated based on the procedures described above. The remote or background CO concentration has been estimated based on monitoring conducted near the project site in February, 2000.

The background Carbon Monoxide (CO) level was monitored for this project in February, 2000 by Interpoll Laboratories, Inc.. The monitoring was performed at a site located near the intersection of 121st Street and Pleasant Avenue South in Burnsville, Minnesota (Figure 1). The monitoring began on February 2, 2000 and ended on February 15, 2000. An independent audit was performed by the MPCA on February 4, 2000. All of the MPCA/EPA guidelines were met by the monitor. The detailed results are in Report Number F0-4704 by Interpoll Laboratories, Inc.

The monitoring was conducted during the winter, which is the worst case season in the Twin Cities area. For this reason, no seasonal adjustment is warranted. Thus, the maximum monitored concentrations of 1.7 ppm one-hour average and 1.3 ppm eight-hour average can be considered to be worst case background CO concentrations for the year 2000. For purposes of the analysis, these background concentrations were adjusted for traffic volume (factor for traffic growth between 2000 and 2002), and vehicle emissions (factor to adjust for anticipated decreases in carbon monoxide emissions from motor vehicles due to emission controls). The results are summarized in Table 1.

Table 1 Calculation of 2002 CO Background Concentrations

	One-Hour	Eight-Hour
Maximum 2000 Monitored Concentration (ppm)	1.7	1.3
Background Traffic Volume Adjustment Factor (2% per year)	1.04	1.04
Emission Adjustment Factor from Mobile 5A	0.92	0.92
Worst-Case 2002 Background Concentration (ppm)	1.6	1.2

Carbon Monoxide Modeling Results

The CO concentrations were analyzed at the intersections of TH 13 at CSAH 5, Embassy Road at the North Access and the intersection of Black Dog Road at the I-35W East Ramp (see Figure 1). The CO analysis for these intersections was done by modeling specific spot receptors at areas of human activity, which may occur for a long period of time, nearest to each of the intersections. The worst case wind direction, from the 36 wind directions modeled, for each receptor was used to determine the maximum concentration for each receptor.

The departure hour of 10:30 – 11:30 p.m. was determined to be the worst traffic hour at intersections impacted by the development. The traffic analysis showed worse levels of service during this departure time period than at other times.

The CO concentrations were based on 2002 forecast traffic volumes, construction of proposed roadway improvements (described in the traffic memo in Section 21 of this document) and optimized signal timing.

Table 2 presents the worst case CO concentrations at the intersections. The one-hour and eight-hour predictions meet the state standards for all conditions modeled.

Table 2 Modeled Carbon Monoxide Concentrations (2002 Build Conditions) Maximum Concentration[1]

Receptor Description	Modeled[2]	1-Hour Average[3]	8-Hour Average[3]	Wind Direction
A1 s.e. of TH 13 at CSAH 5	1.8	3.4	2.5	350
A2 n.e. of TH 13 at CSAH 5	2.8	4.4	3.2	200
A3 n.w. of TH 13 at CSAH 5	1.9	3.5	2.5	130
A4 s.e. of Embassy Road at North Access	1.7	3.3	2.4	290
A5 Black Dog Road at I-35W East Ramp[4]	4.8	6.4	4.6	280

Note: [1]CO concentrations are in parts per million.
[2]Does not include inspection maintenance, but does include oxygenated fuels.
[3]Includes CO background for 1- and 8-hour averages of 1.6 ppm and 1.2 ppm, respectively
[4]Receptor A5 uses the highest sidewalk receptor pair from the averaging of 6 sidewalk receptor pairs.

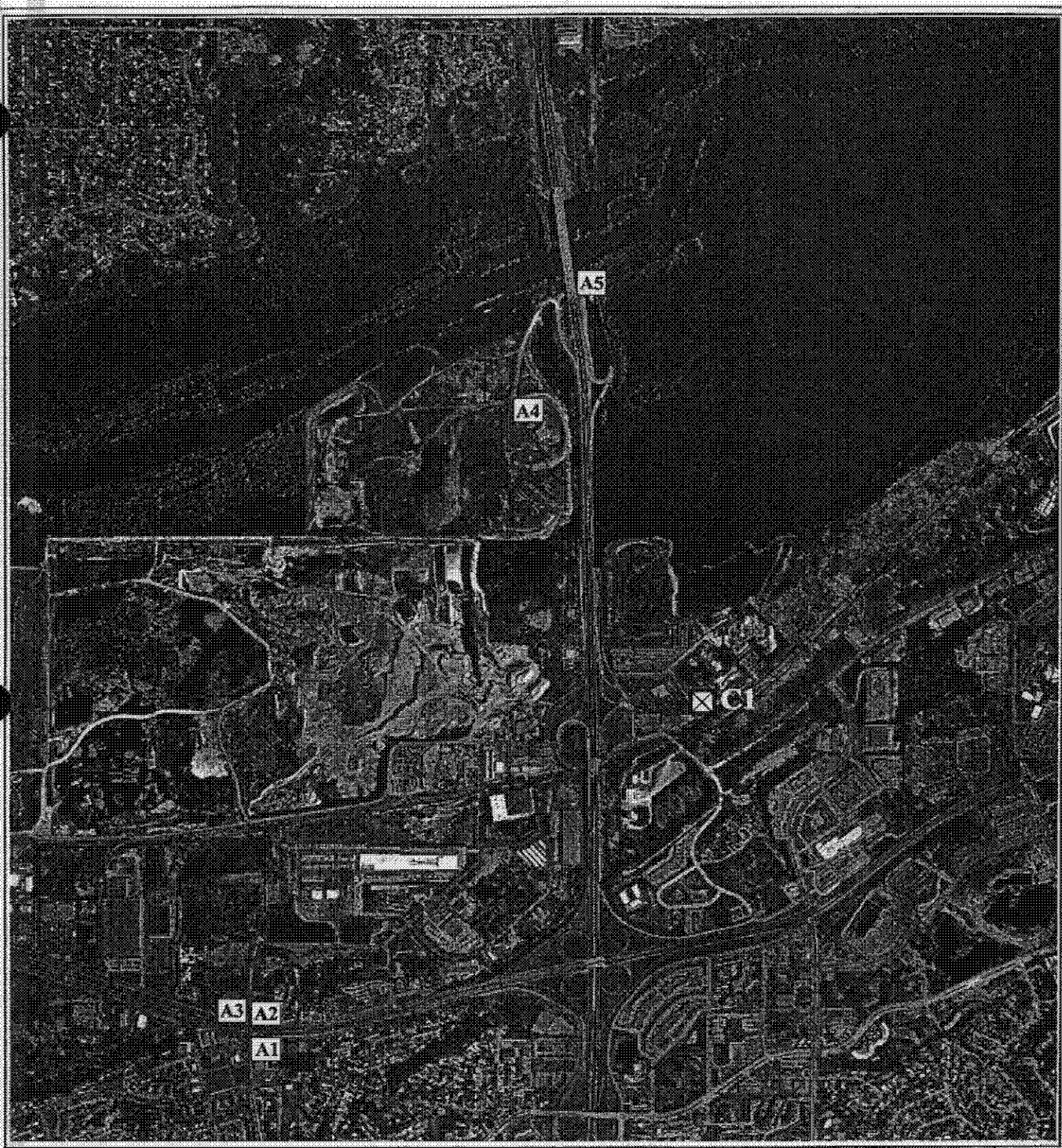
Predicted CO concentrations at the three intersections modeled will be in compliance with state and federal air quality standards for the conditions modeled (build conditions in 2002). Under the 2002 build conditions the highest one-hour and eight-hour predicted concentrations will be 6.4 and 4.6 ppm,

respectively. These values are below the Minnesota State standards of 30 ppm for one-hour and 9 ppm for eight-hours, and no air quality mitigation measures are proposed as a part of the project.

PM10 ANALYSIS

This site is in an attainment area for PM10 particulates. The operation of the project is not expected to affect the PM10 emission levels.

Poor Quality



Black Dog Amphitheater

Air Quality Sites

A Air Quality Modeling Locations

Carbon Monoxide Monitoring Location

N

BRW

Figure 22.1

March 2000

23. Stationary source air emissions.

Describe the type, sources, quantities and compositions of any emissions from stationary sources of air emissions such as boilers, exhaust stacks or fugitive dust sources. Include any hazardous air pollutants (consult *EAW Guidelines* for a listing) and any greenhouse gases (such as carbon dioxide, methane, nitrous oxide) and ozone-depleting chemicals (chloro-fluorocarbons, hydrofluorocarbons, perfluorocarbons or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.

Vehicle related emissions are discussed in Item 22. With respect to fugitive dust generated during the construction process, there are a number of mitigative measures that can be taken to minimize these emissions. Since the majority of the surface parking lot is to be covered by crushed limestone, a binder will be added to this material to reduce dust. The City Engineering Department also has a standard set of construction practices that have been developed in conjunction with the Dakota County Soil Conservation District. These construction practices will be required as conditions of approval for the site grading and erosion control plans. All infrastructure projects conducted by the City of Burnsville will utilize Best Management Practices. The City will manage and inspect construction and require that dust suppression methods be used. The City will require similar activities of the private construction to occur on the amphitheater site.

Landfill gas is produced when waste is degraded by microbial and chemical reactions. The primary constituents of landfill gas are methane and carbon dioxide. Methane is a colorless, odorless gas that, in the presence of oxygen, can be explosive within a range of concentrations. The potential to create an explosive condition is the primary reason why MPCA does not allow placement of enclosed structures on landfill covers. This restriction will also apply to the Freeway Landfill.

Landfill gas also contains small amounts of other organic and inorganic compounds. Some of these compounds are classified as hazardous air pollutants, such as benzene, tetrachloroethylene, carbon tetrachloride, toluene, chloroform, vinyl chloride, and xylene. There are many more hazardous and non-hazardous compounds present in landfill gas. Some of the landfill gas being generated at the Freeway Landfill is being emitted to the atmosphere in an uncontrolled manner. The proposed landfill cover construction will include placement of a continuous geomembrane (plastic sheet) over the waste after proper buffer soil is placed and graded. This plastic will both reduce infiltration of water from precipitation into the waste to reduce leachate generation, and it will provide a barrier to keep atmospheric oxygen from entering the waste and landfill gas from exiting the cover. In addition to the landfill cover , a system of piping will be

installed in the waste to collect and transport the gas to a blower/flare unit. The blower will apply a vacuum to the piping system. Pipe installed in the waste will be perforated to allow landfill gas to be drawn in. Most of the perforated pipe will be installed horizontally in the waste, though some pipe will also be installed as a vertical well. The perforated pipe will be connected to solid-walled pipe to convey the gas to the blower. After the gas discharges from the blower, it will be directed into a vertical stack, called an enclosed flare, where it will be ignited and burned. Data from other landfill enclosed flare systems indicate that approximately 99 percent of the hazardous air pollutants are destroyed before the combustion gas is discharged into the air.

24. Odors, noise and dust.

Will the project generate odors, noise or dust during construction or during operation? _X_Yes __No
If yes, describe sources, characteristics, duration, quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify locations of nearby sensitive receptors and estimate impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

The City of Burnsville directed the developer to retain the services of a qualified acoustical expert to conduct an analysis of the sound levels emanating from the proposed facility. The noise study conducted in 1989 for an identically sized facility predicted no violations of the Minnesota Noise Standard. Attached in its entirety is the acoustical analysis report prepared by Dennis Paoletti of Paoletti Associates, Inc. of San Francisco California. Also attached, after the Paoletti report, is a study of wind and temperature structure at the proposed amphitheater site, prepared by Bruce F. Watson, Consulting Meteorologist. This report was prepared as part of the noise study at the request of the MPCA.

Based on the information contained in the Paoletti report, the City is working with the developer, project architect, engineer and operator to identify other potential design opportunities that would result in further noise mitigation. The City intends to require the installation of a permanent noise monitoring system to detect noise levels at the perimeter of the site that exceed established thresholds. The City will work with the MPCA Noise Section in identifying these thresholds. The Planned Unit Development (PUD) Agreement between Rose/Wild LLC and the City of Burnsville will require immediate action on the part of the operators in the event that noise from the facility exceeds acceptable levels.

The PUD Agreement will also require noise monitoring in the vicinity of noise receptors in both Bloomington and Burnsville. This noise monitoring will continue until it is determined that it is no longer necessary. If the noise monitoring finds violations, there will be procedures in place to take immediate remedial action. The PUD Agreement will also provide for performance guarantees and penalties for noncompliance.

In summary, the City of Burnsville and the project developer are continuing to work to eliminate the remaining small potential for noise violations. The first focus of this effort will be on physical design changes, including structural noise barriers, walls, berms, landscaping, etc. This analysis will also reconsider the location and array of speakers serving the lawn seating area, which is the portion

of the facility that continues to present the potential for some noise problems, under a rare combination of factors. In addition, the City will require permanent noise monitoring around the perimeter of the site and off site monitoring in the vicinity of noise receptors until it is no longer needed. The PUD Agreement will require operational procedures related to the noise monitoring systems and it will also provide performance guarantees and penalties for noncompliance.

Noise Monitoring

Existing noise levels were monitored in March 2000 at one residential location (see Figure 24.1). The site is just west of I-35W, north of the Minnesota River and south of River Terrace Circle.

Noise Analysis

Existing and future noise levels (2002) were projected using the Federal Highway Administration (FHWA) noise prediction model STAMINA 2.0, as modified for use by the Minnesota Department of Transportation (Mn/DOT). Noise projections were based on anticipated 2002 forecast peak departure hour traffic volumes, vehicle speeds, mix of vehicles, roadway grades, and the distance from the roadway centerline to the receptor (horizontal and vertical).

The following assumptions were used in modeling the noise levels:
Vehicle speeds: existing speed limit
Vehicle mix: 97 percent of automobiles and light trucks, 2 percent medium trucks and 1 percent heavy trucks

Typically the human ear can just barely perceive a three-decibel change in noise levels, and a doubling in traffic would be necessary to achieve this three-decibel increase in noise levels. The anticipated peak hour traffic volume on I-35W will approximately double (approximate 95% increase), and the resultant noise increase will be just barely perceptible. There are no other areas with sensitive noise receivers that will experience a significant increase in nearby traffic.

The results of the noise analysis are shown in Table 3. The noise level change from the 2002 No-Build to the 2002 Build peak departure hour (10:30-11:30 p.m.) is 1 decibel for L10, and 3 decibels for L50. L10 and L50 are the noise levels in decibels that are exceeded 10 and 50 percent of a time interval, usually 1 hour.

Table 24.1 Monitored and Modeled Noise Levels (dBA)

	L10	L50
Monitored	59	57
Existing	60	57
2002 No Build	61	57
2002 Build	62	60
State Standards	55	50

Construction Noise

Construction noise has the potential for a significant noise impact at sensitive receivers if they are located adjacent or close to the project site.

Construction noise would be generated during both the project site preparation phase and during the building construction phase. Noise impacts caused by construction activities in the project area would vary depending on the type of equipment in use, the location of equipment on the construction site, and the operating mode. During a typical work cycle, construction equipment may be idling, preparing to perform a task, or operating under a full load. It may be congregated in a specific area or spread out over a larger area. Thus, the total noise impact on a single receiver point resulting from construction of the project would vary significantly both day-to-day and hour-to-hour.

The range of average noise levels monitored at fifty feet from a variety of types of construction equipment is shown in Table 9. These types of equipment are generally associated with site grading and site preparation, generally the noisiest phases of construction.

Table 24.2 Typical Construction Equipment Noise Levels at 50 Feet

Equipment Type	Peak Noise Level Range	(dBA) Average
Scraper	80-93	88
Dozer	72-84	80
Compactor	73-75	74
Truck	82-94	91

Source: Noise from Construction Equipment and Operations, Building Equipment and Home Appliances, U.S. Environmental Protection Agency, Washington, D.C., December 31, 1971.

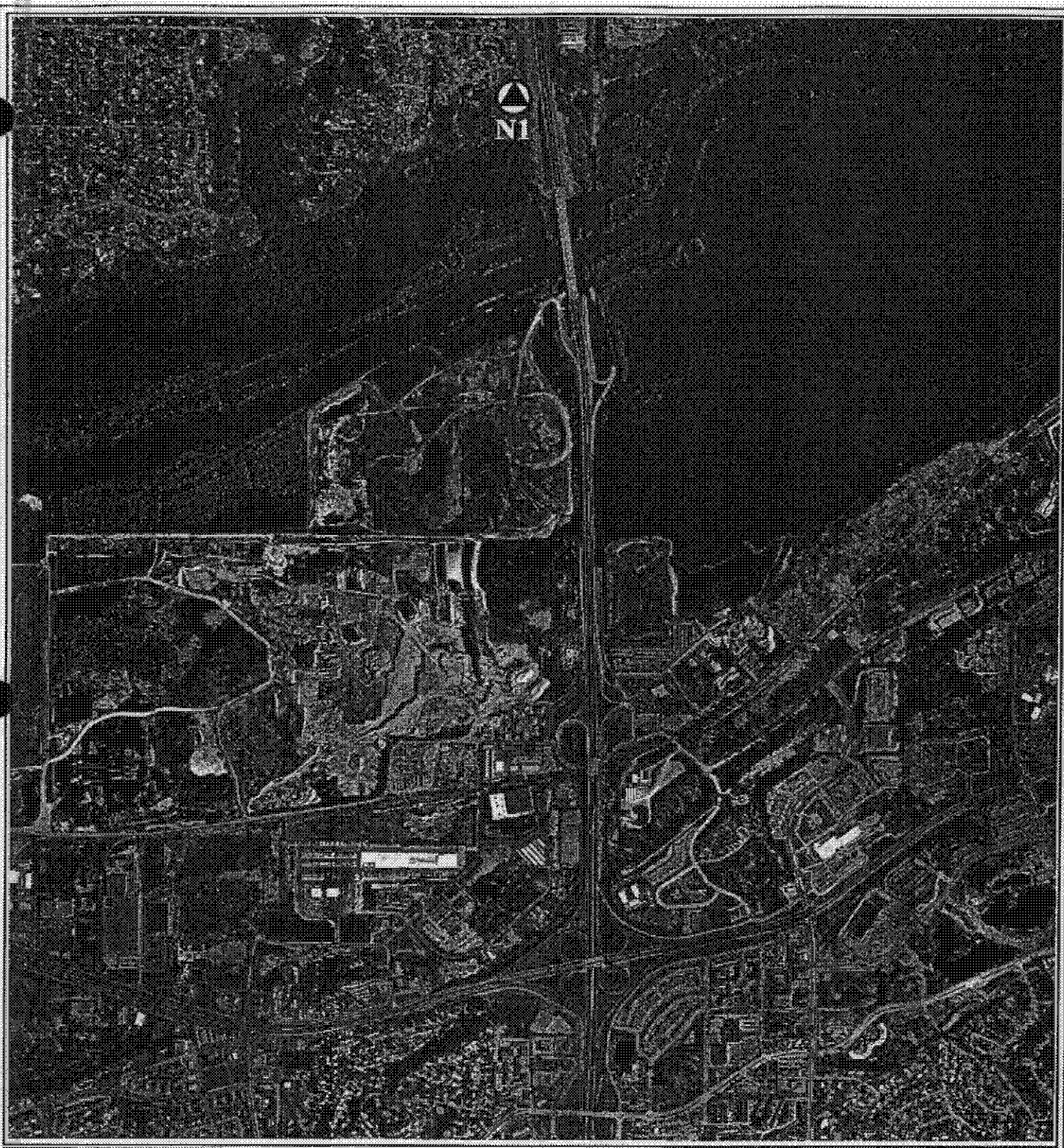
The actual noise levels which may be experienced near a construction zone depend on:

- The distance between the construction equipment and the receiver.
- The type of equipment in use.
- The percent of the time the equipment attains the peak level.
- Noise control features incorporated into the equipment.

Construction activities will occur only during daytime hours. The construction noise will not generally be louder than the daytime roadway noise.

The total contribution of the Black Dog Amphitheater traffic is a small percentage of the background traffic on nearby existing roadways. Typically, the human ear can just barely perceive a three decibel change in noise levels. Since a doubling in traffic would be necessary to achieve this three-decibel increase in noise levels, the site generated noise will be below perceptible levels of noise increases. No traffic noise mitigation measures are proposed as a part of the project.

Poor Quality



Black Dog Amphitheater

Noise Receptor Site

Noise Monitor Location

BRW

Figure 24.1

N

March 2000

PAOLETTI

Paoletti Associates, Inc.
Acoustical and
Audiovisual Consultants

649 Mission Street, 5th Floor
San Francisco
California 94105

415-391-7610
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paoletti@compuserve.com

17 April
~~4 March~~ 2000

Teresa Sterns
Sterns & Associates LLC
449 W. 7th Street
St. Paul, MN 55102

Subject: Acoustical Analysis
Black Dog Amphitheater – Burnsville, MN
PA Project No. 99096

Dear Teresa:

We have analyzed environmental noise impact for the Black Dog Amphitheater project in Burnsville, Minnesota. The site plan shows that the amphitheater has been relocated recently to the southeast portion of the site and at increased setbacks from Bloomington residences across the river by approximately 1000 ft. This analysis takes into account weather patterns for the valley area as documented in the report prepared by the meteorologist retained for this project (Wind and Temperature Structure at the Proposed Wild Amphitheater, by Bruce F. Watson, 28 March 2000).

INTRODUCTION

Our analysis is based on the use of the ENM computer noise prediction model, the results of the ambient noise survey and demonstration testing undertaken (6, 7 January), other information contained in the job files and literature data regarding temperature and wind effects on noise propagation. Our model has taken into account terrain characteristics and was calibrated to the noise levels measured during the January demonstration and other known industry benchmarks.

EXECUTIVE SUMMARY

Based on our noise model analysis, objective measurements, and subjective evaluation of the acoustical conditions associated with the proposed Black Dog Amphitheater, it is our opinion that the Minnesota Pollution Control Agency Noise Standards would not be exceeded at either residences to the north in the City of Bloomington; or at residences to the south in the City of Burnsville, when the facility is constructed, except under a few extreme conditions. Refer to Tables 1, 2 and 3 for these conditions. The music emanating from the amphitheater may be audible under certain conditions, but is not expected to exceed the noise standards in most cases. This assumes that all of the noise control design techniques mentioned in this report are incorporated into the design and construction of the completed amphitheater facility.

For the sound demonstration conducted on Friday evening 7 January, the amplified sound levels did not have the benefit of directional loudspeakers, a roof/canopy structure, or a backstage building nor the construction of a noise berm. Therefore, the subjective assessment of a simulated amphitheater event was not completely "realistic". This was intentional. We were directed to demonstrate the actual worst case scenario. An actual event at the amphitheater, when constructed, would not be as noticeable as it was during the demo, even though the audibility at the Bloomington residences was "slight", and the audibility in Burnsville was very noticeable at certain locations.

CRITERIA

The criterion for community noise intrusion has been established, and is enforced by the Minnesota Pollution Control Agency Chapter 7030, Section 7030.0040 Noise Standards. These standards are summarized herein:

Noise Area Classification (NAC) Land Use Activity	Criteria L_{10} (L_{10})	L_{50} (L_{50})
1. **Residential** (also: hotel/motel, educational, medical, religious, cultural, entertainment, etc.)	**65 (55)**	**60 (50)**
2. Retail (also: transportation terminals, business/ personal/repair/legal services, parks, etc.)	70 (70)	65 (65)
3. Manufacturing (also: transportation, utilities, racetracks/ fairgrounds, mining activities, etc.)	80 (80)	75 (75)

Notes:

The L_{10} and L_{50} values represent the level of sound, measured in decibels, using the A-weighting scale, exceeded 10% and 50% of the time. For instance, 10% of an hour is six (6) minutes; 50% of an hour is thirty (30) minutes. The values in parenthesis are for "nighttime" (defined as 10 p.m. to 7 a.m.); the values not in parenthesis are for daytime hours, (defined as 7 a.m. until 10 p.m).

The noise criteria established by the Minnesota Pollution Control Agency are very stringent and allows for no variance. If the existing ambient already exceeds the criteria, there is no increase above the ambient that is allowed by a new noise source, which is common in many other community noise standards.

There is also no allowance for or discussion of discriminatory audibility between unlike noise sources. In a given environment where the ambient consists of a combination of a number of noise sources, one's ears are more sensitive than a measuring device. The ear is able to discriminate between two different sounds of equal (or unequal) level. A sound level measuring instrument cannot differentiate between noise sources, and only records the level of the combined sound energy. Hence, the human ears can easily detect "music", or any other distinctive noise source (e.g. an airplane, lawn mower, etc.) in a given ambient environment.

There is some controversy within the acoustical community regarding the use of L_{10} and L_{50} descriptors to adequately correlate annoyance and audibility of a "foreign" sound source within a community. However, unless the governing bodies are willing to investigate this issue and possibly change the State standards, the point is mute. There are some states that are in fact looking into newer methods to more accurately correlate standards with "foreign" noise sources, such as music/entertainment.

It should be noted that the MPCA noise standards change at 10:00 p.m. They go from "daytime" to "nighttime", and become more stringent. We understand that a concert event would begin at the amphitheater at 7:00 p.m., and that a typical concert event would conclude by 11 p.m. Therefore, the total time that any concert event could potentially impact or exceed the more stringent nighttime criteria is 60 minutes.

The noise levels expected from any "non rock" event (e.g. "pop", "classical", "middle of the road", even classical jazz), would be significantly less than the loudest event modeled. Of the 30 or so seasonal performance events we understand are anticipated for the Black Dog Amphitheater, approximately six (6) are expected to be in the "extremely loud" category, similar in sound level of our demo. However, it should be noted that even the loud events have pure vocal, ballad, and rest-time in which the sound level is much lower than the maximum levels we demonstrated. We have indicated our analysis for sound levels of 85 dBA (normally considered "loud"), 95 dBA ("very loud"), as well as 105 dBA ("extremely loud")

A study made of measured sound levels that occur during a (series of) music concerts at amphitheaters indicates that the sound levels exceed 105 dBA only 1% of the time. Sound levels of 100 to 105 dBA was only exceeded 4% of the time. The sound level measured 95-100 dBA occurred for 22% of the time. For 73% of the time, the sound level was less than 95 dBA.

ANALYSIS

Sound System Noise (Distributed Lawn Loudspeakers)

The predicted noise levels, generated by the distributed lawn loudspeaker system, at three (3) representative receptors (residential areas) under neutral, upwind and downwind conditions are shown in Tables 1, 2 and 3. The percentage of occurrence for each weather condition is also included in the tables (based on the Watson meteorological report). Calm weather refers to the condition where winds occur at speeds of 3 knots or less; the neutral condition is combined with the calm condition and refers to a cross wind condition that would not affect receptors. We note that the calm/neutral condition would be the prevailing wind pattern for all 3 residential receptor areas (i.e. more than 50% of the time).

The selected residential areas are referred to as Receptors 1, 2, and 3, and are shown in the attached Figures. These noise level predictions are based on an A-weighted noise level of 105 dB at the mix/control station, that the speakers will be 20 feet above the ground, and the on-axis speaker direction points towards the ground. For the lawn speakers we have assumed an average sound pressure level of 105 dB at 3 feet (i.e. 90-95 dBA at listener level). The quoted noise levels are interpreted to be L10 noise levels; therefore the assessment is for compliance to the L10 noise nighttime residential limit of 55 dBA. We have also assumed L50 noise levels to be 5 dB lower than L10 noise levels based on review of noise data for similar events and published information in the literature.

Noise contours are also developed for a representative graphical demonstration of the distributed lawn sound system noise coverage. We have taken into account the directivity of the sound system and the barrier effect of the solid back-stage, roof/canopy and side-walls. It is assumed that the side-walls should connect to the back-stage, extending as far as possible to totally enclose the fixed seated area and are full height (from ground level to the underside of the roof/canopy). Under these assumptions we have produced L10 and L50 noise contours for calm/neutral, upwind and downwind weather conditions.

The Minnesota Noise Standards are already exceeded due to traffic noise at some of the residential receptors. To further analyze the impact of sound intrusion throughout the community, related to weather conditions, ambient noise measurements during evening and nighttime hours typical of event times (and preferably the season) may be made over a period of several days.

TABLE 1

Predicted Sound System Noise at Receptor 1 - Bloomington Residences on Overlook Circle

I. Calm & Neutral Condition (66% frequency of occurrence during concert times)

Venue Size	Predicted Sound System Noise at Receptor 1					
	105 dBA at the mixing station		95 dBA at the mixing station		85 dBA at the mixing station	
	L10 at Receptor 1 (dBA)	L50 at Receptor 1 (dBA)	L10 at Receptor 1 (dBA)	L50 at Receptor 1 (dBA)	L10 at Receptor 1 (dBA)	L50 at Receptor 1 (dBA)
Full-size; 19,500 people (7,500 under the canopy and 12,000 on the lawn)	57	52	47	42	37	32
Mid-size; 11,000 people (7,500 under the canopy and 3,500 on the lawn)	50	45	40	35	30	25
Minimum-size; 7,500 people (all under the canopy)	49	44	39	34	29	24

II. Upwind Condition (4% frequency of occurrence during concert times)

Venue Size	Predicted Sound System Noise at Receptor 1					
	105 dBA at the mixing station		95 dBA at the mixing station		85 dBA at the mixing station	
	L10 at Receptor 1 (dBA)	L50 at Receptor 1 (dBA)	L10 at Receptor 1 (dBA)	L50 at Receptor 1 (dBA)	L10 at Receptor 1 (dBA)	L50 at Receptor 1 (dBA)
Full-size; 19,500 people (7,500 under the canopy and 12,000 on the lawn)	51	46	41	36	31	26
Mid-size; 11,000 people (7,500 under the canopy and 3,500 on the lawn)	44	39	34	29	24	19
Minimum-size; 7,500 people (all under the canopy)	43	38	33	28	23	18

III. Downwind Condition (22% frequency of occurrence during concert times)

Venue Size	Predicted Sound System Noise at Receptor 1					
	105 dBA at the mixing station		95 dBA at the mixing station		85 dBA at the mixing station	
	L10 at Receptor 1 (dBA)	L50 at Receptor 1 (dBA)	L10 at Receptor 1 (dBA)	L50 at Receptor 1 (dBA)	L10 at Receptor 1 (dBA)	L50 at Receptor 1 (dBA)
Full-size; 19,500 people (7,500 under the canopy and 12,000 on the lawn)	66	61	56	51	46	41
Mid-size; 11,000 people (7,500 under the canopy and 3,500 on the lawn)	59	54	49	44	39	34
Minimum-size; 7,500 people (all under the canopy)	58	53	48	43	38	33

TABLE 2

Predicted Sound System Noise at Receptor 2 - Burnsville Residences on Vista Drive

I. Calm & Neutral Condition (59% frequency of occurrence during concert times)

Venue Size	Predicted Sound System Noise at Receptor 1					
	105 dBA at the mixing station		95 dBA at the mixing station		85 dBA at the mixing station	
	L10 at Receptor 2 (dBA)	L50 at Receptor 2 (dBA)	L10 at Receptor 2 (dBA)	L50 at Receptor 2 (dBA)	L10 at Receptor 2 (dBA)	L50 at Receptor 2 (dBA)
Full-size; 19,500 people (7,500 under the canopy and 12,000 on the lawn)	49	44	39	34	29	24
Mid-size; 11,000 people (7,500 under the canopy and 3,500 on the lawn)	44	39	34	29	24	19
Minimum-size; 7,500 people (all under the canopy)	43	38	33	28	23	18

II. Upwind Condition (30% frequency of occurrence during concert times)

Venue Size	Predicted Sound System Noise at Receptor 1					
	105 dBA at the mixing station		95 dBA at the mixing station		85 dBA at the mixing station	
	L10 at Receptor 2 (dBA)	L50 at Receptor 2 (dBA)	L10 at Receptor 2 (dBA)	L50 at Receptor 2 (dBA)	L10 at Receptor 2 (dBA)	L50 at Receptor 2 (dBA)
Full-size; 19,500 people (7,500 under the canopy and 12,000 on the lawn)	43	38	33	28	23	18
Mid-size; 11,000 people (7,500 under the canopy and 3,500 on the lawn)	38	33	28	23	18	13
Minimum-size; 7,500 people (all under the canopy)	37	32	27	22	17	12

III. Downwind Condition (3% frequency of occurrence during concert times)

Venue Size	Predicted Sound System Noise at Receptor 1					
	105 dBA at the mixing station		95 dBA at the mixing station		85 dBA at the mixing station	
	L10 at Receptor 2 (dBA)	L50 at Receptor 2 (dBA)	L10 at Receptor 2 (dBA)	L50 at Receptor 2 (dBA)	L10 at Receptor 2 (dBA)	L50 at Receptor 2 (dBA)
Full-size; 19,500 people (7,500 under the canopy and 12,000 on the lawn)	56	51	46	41	36	31
Mid-size; 11,000 people (7,500 under the canopy and 3,500 on the lawn)	51	46	41	36	31	26
Minimum-size; 7,500 people (all under the canopy)	50	45	40	35	30	25

TABLE 3

Predicted Sound System Noise at Receptor 3 – Burnsville, Meadowbrook Village

I. Calm & Neutral Condition (66% frequency of occurrence during concert times)

Venue Size	Predicted Sound System Noise at Receptor 1					
	105 dBA at the mixing station		95 dBA at the mixing station		85 dBA at the mixing station	
	L10 at Receptor 3 (dBA)	L50 at Receptor 3 (dBA)	L10 at Receptor 3 (dBA)	L50 at Receptor 3 (dBA)	L10 at Receptor 3 (dBA)	L50 at Receptor 3 (dBA)
Full-size; 19,500 people (7,500 under the canopy and 12,000 on the lawn)	50	45	40	35	30	25
Mid-size; 11,000 people (7,500 under the canopy and 3,500 on the lawn)	44	39	34	29	24	19
Minimum-size; 7,500 people (all under the canopy)	42	37	32	27	22	17

II. Upwind Condition (4% frequency of occurrence during concert times)

Venue Size	Predicted Sound System Noise at Receptor 1					
	105 dBA at the mixing station		95 dBA at the mixing station		85 dBA at the mixing station	
	L10 at Receptor 3 (dBA)	L50 at Receptor 3 (dBA)	L10 at Receptor 3 (dBA)	L50 at Receptor 3 (dBA)	L10 at Receptor 3 (dBA)	L50 at Receptor 3 (dBA)
Full-size; 19,500 people (7,500 under the canopy and 12,000 on the lawn)	43	38	33	28	23	18
Mid-size; 11,000 people (7,500 under the canopy and 3,500 on the lawn)	37	32	27	22	17	12
Minimum-size; 7,500 people (all under the canopy)	35	30	25	20	15	10

III. Downwind Condition (22% frequency of occurrence during concert times)

Venue Size	Predicted Sound System Noise at Receptor 1					
	105 dBA at the mixing station		95 dBA at the mixing station		85 dBA at the mixing station	
	L10 at Receptor 3 (dBA)	L50 at Receptor 3 (dBA)	L10 at Receptor 3 (dBA)	L50 at Receptor 3 (dBA)	L10 at Receptor 3 (dBA)	L50 at Receptor 3 (dBA)
Full-size; 19,500 people (7,500 under the canopy and 12,000 on the lawn)	57	52	47	42	37	32
Mid-size; 11,000 people (7,500 under the canopy and 3,500 on the lawn)	51	46	41	36	31	26
Minimum-size; 7,500 people (all under the canopy)	49	44	39	34	29	24

Notes:

O Indicates condition which exceeds the criteria

1- *Residential noise limits imposed on this project are L10 not to exceed 55 dBA and L50 not to exceed 50 dBA for nighttime hours (10pm to 7am). Daytime limits are 10 dB less restrictive.*
2- *The entire analysis is based on predicted L10 noise levels; L50 noise levels are estimated at 5 dB less than the predicted L10 levels. This is based on a review of noise measurement results for similar types of projects. The relationship of Lmax to statistical limits (L10 or L50) may vary greatly depending on type of music or even for each song and performer.*
3- *The covered/canopy area includes full height (from ground level to the underside of the canopy) and full length sidewalls and backside. Acoustical absorption material is assumed on the underside of the canopy for noise reduction and for limiting reverberant build-up.*
4- *A noise limit of 105 dBA is assumed at the mixing/control station. Lawn speakers are limited to 105 dBA at 3 feet, on-axis.*
5- *All speakers (main and lawn) are assumed aiming down towards the audience.*
6- *All main speakers are assumed to be located inside the covered area, a minimum of 30 feet back from the open side.*
7- *The row of main speakers nearest the open side of the canopy is assumed turned off under the minimum-size venue condition.*
8- *Lawn speakers are operating only for the full-size venue condition.*
9- *Lawn speakers are mounted on poles 20 feet or less above ground.*
10- *Upwind and downwind conditions are modeled for a wind speed in the range of 5 to 10 knots. Upwind implies wind blowing away from the receptor and downwind is toward the receptor.*
11- *All three modeled conditions (calm/neutral, upwind and downwind) do not add to 100% because 8% of the time weather is classified too windy from a noise standpoint (winds in excess of 10 knots). Strong winds result in large and rapid noise fluctuations due to atmospheric turbulence and under such conditions noise levels can not be predicted with any reasonable degree of confidence.*
12- *Existing ambient sound levels are typically in the range of 45 dBA – 65 dBA, depending on location, and proximity to highways. The predicted noise levels in Tables 1, 2 and 3 are often below the existing ambient – and therefore would not be audible.*

Sound System Noise for Full Venue
at Selected Receptors Under Alternative Weather Conditions

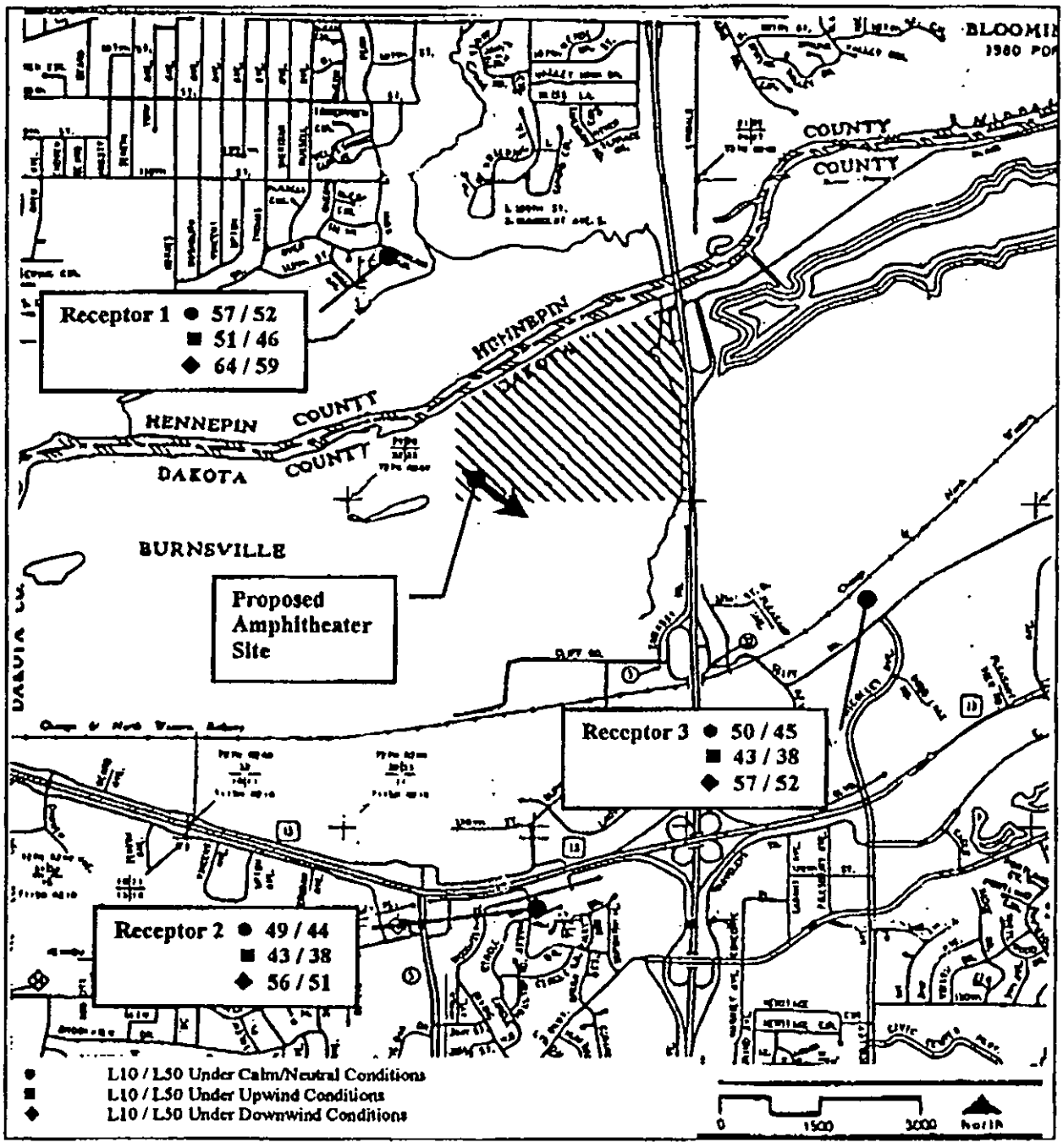

Figure 1

L10 Contours
Sound System Noise for Full Venue
Calm or Neutral Weather Conditions

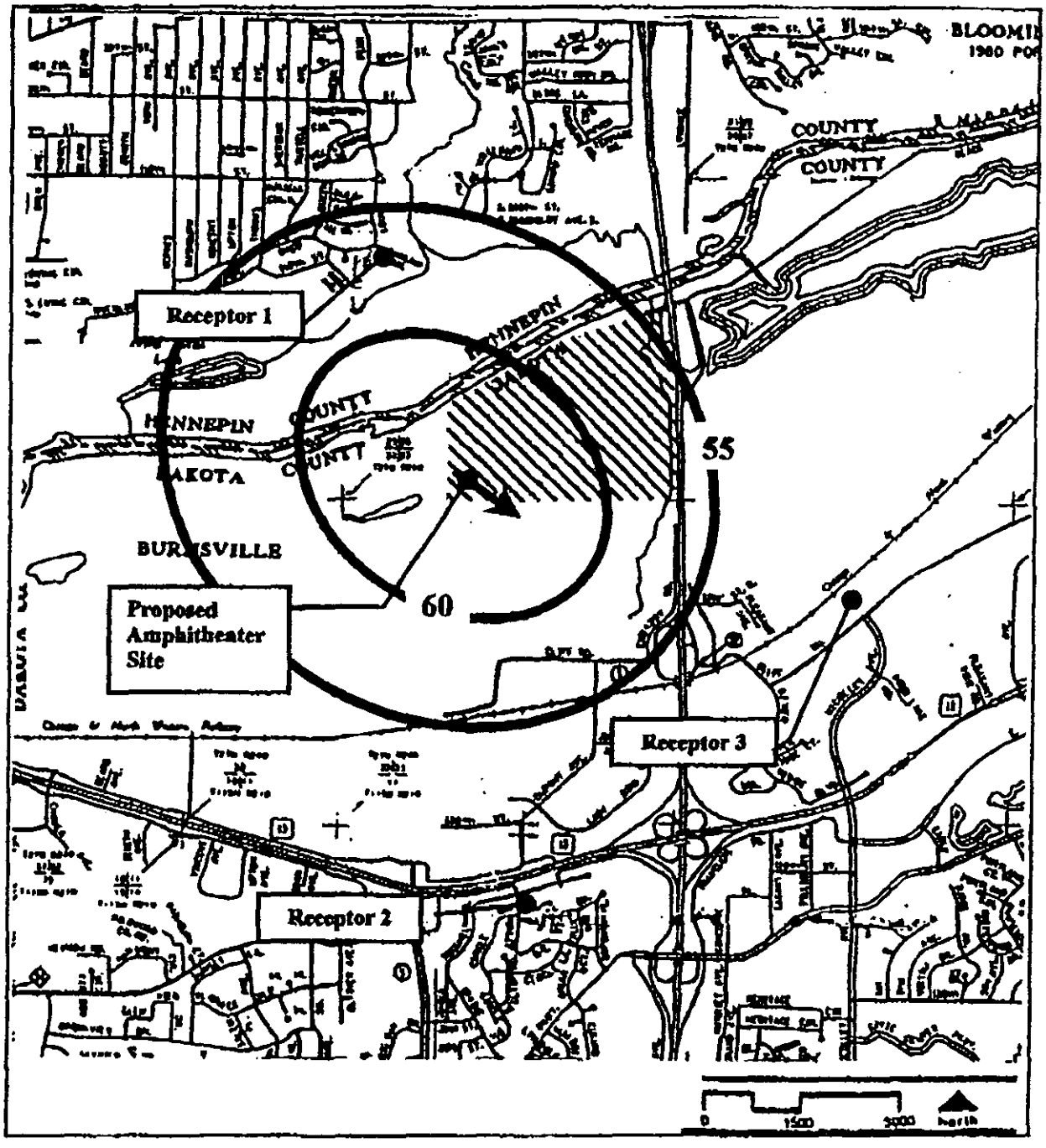

Figure 2

L50 Contours
Sound System Noise for Full Venue
Calm or Neutral Weather Conditions

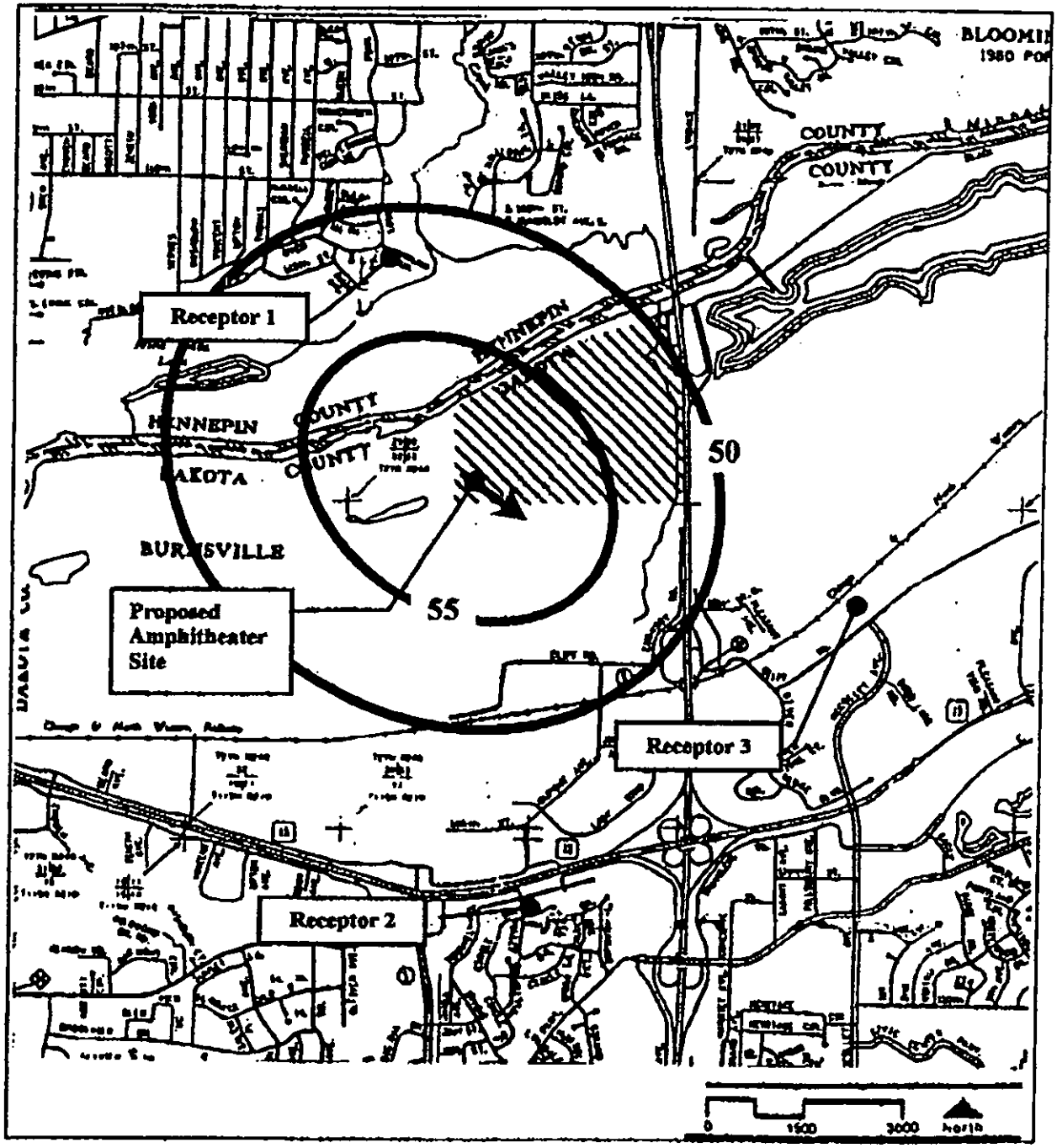

Figure 3

L10 Contours
Sound System Noise for Full Venue
Upwind Condition for Receptor 1

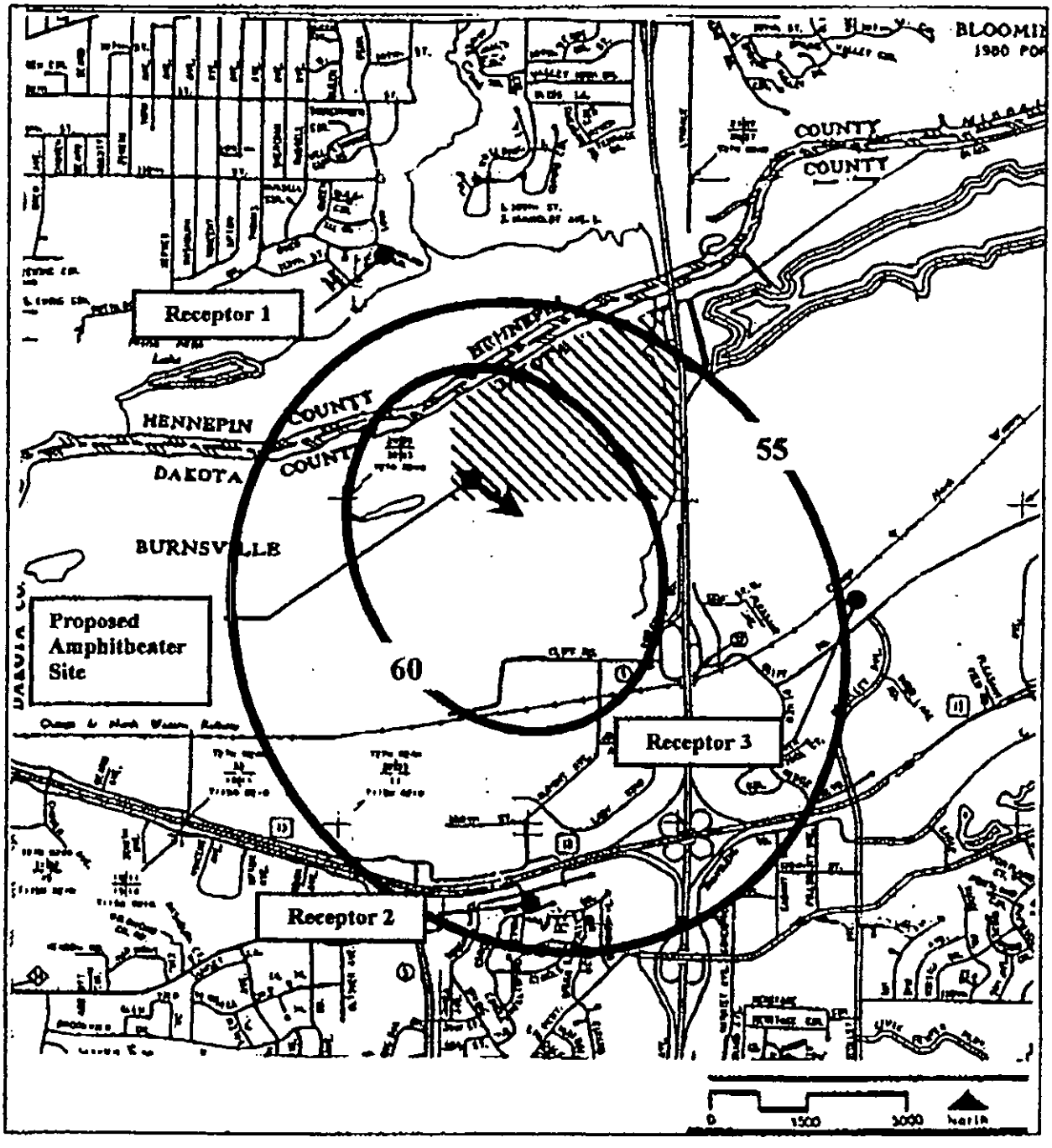

Figure 4

L50 Contours
Sound System Noise for Full Venue
Upwind Condition for Receptor 1

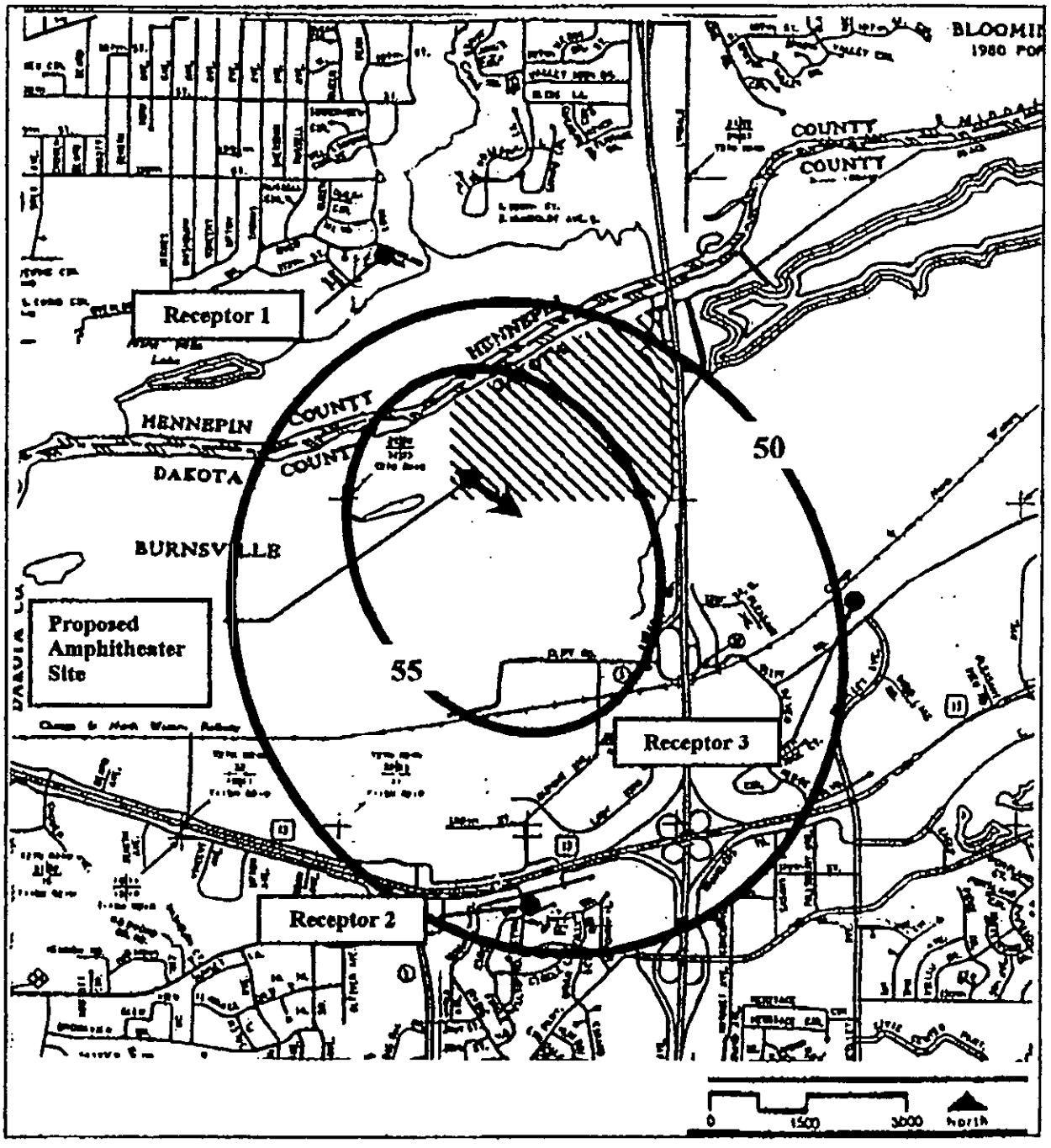

Figure 5

L10 Contours
Sound System Noise for Full Venue
Downwind Condition for Receptor 1

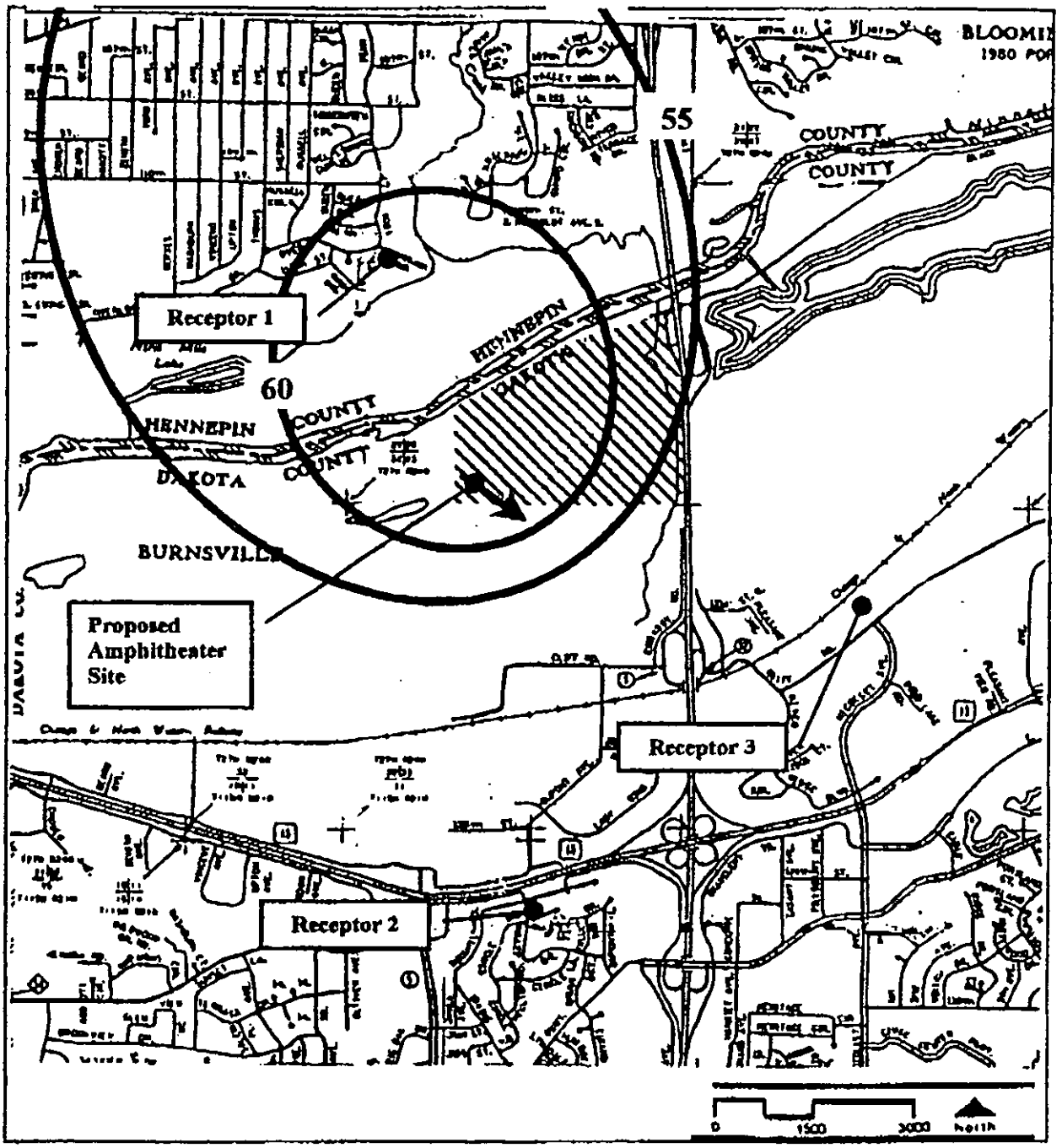

Figure 6

L50 Contours
Sound System Noise for Full Venue
Downwind Condition for Receptor 1

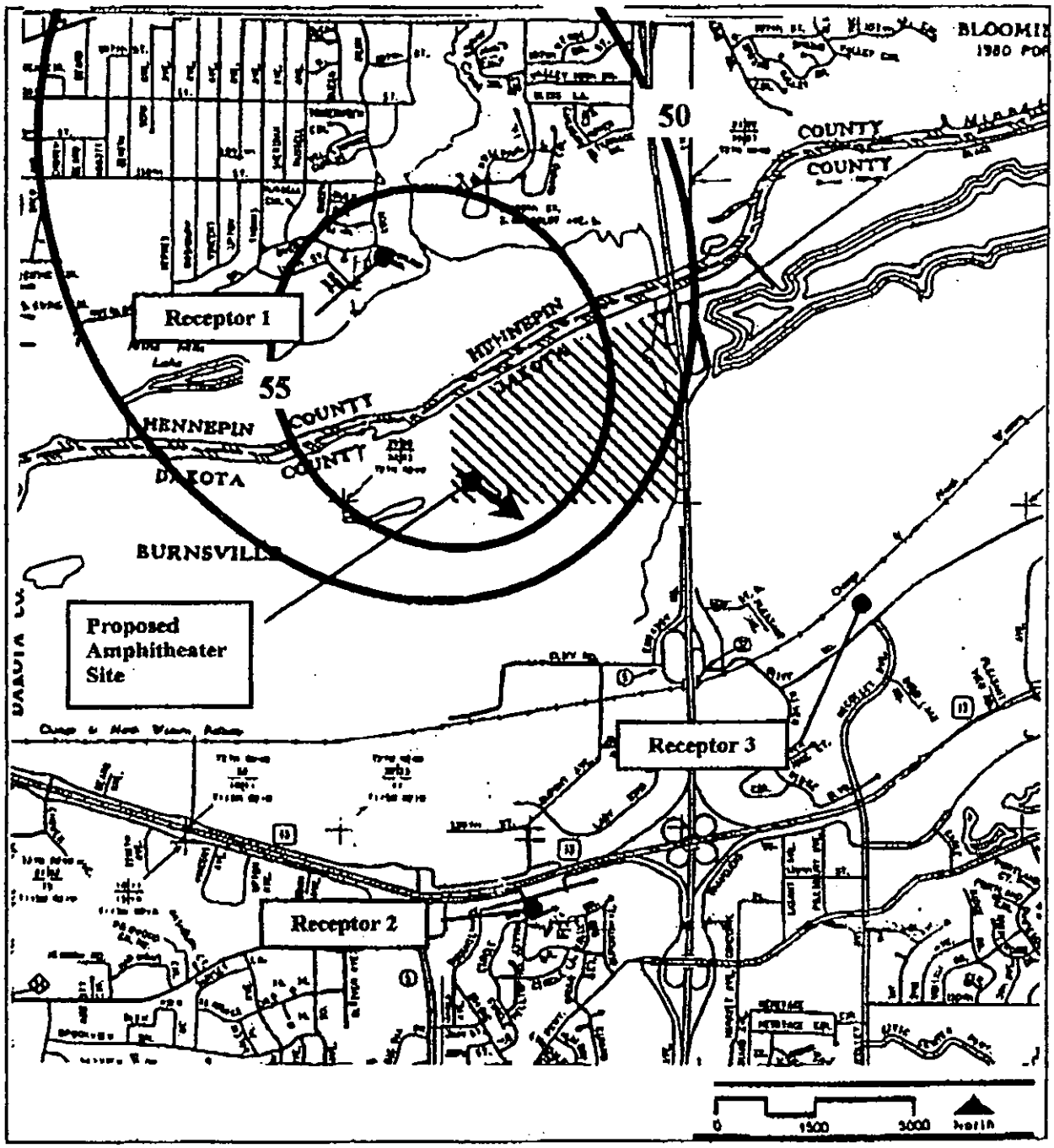

Figure 7

Wind and Temperature Assessment

Wind and temperature information for the project vicinity was provided by Bruce Watson, the meteorologist for this project. A copy of his report (dated 28 March 2000) was reviewed and used to identify weather patterns and prevailing weather conditions; in particular, the data related to the Concert Wind Rose Diagrams 7 p.m. to 10:30 p.m. CDT from May 1 to September 30.

During concert times, the weather is considered calm (0 to 3 knots) 47% of the time, moderately windy (4 to 10 knots) 44% of the time, and too windy (greater than 10 knots) about 8% of the time. The prevailing wind pattern would be from southeast, south and southwest; it would therefore adversely affect residential receptors to the northwest, north and northeast of the amphitheater. For light to moderate winds (4 to 10 knots) noise levels could increase as much as 10 dB downwind and decrease by as much as 7 dB upwind (refer to Table 1). Based on our experience with traffic noise research we have noted variations of -5 dB to +5 dB under many different wind conditions. Strong winds (more than 10 knots) will produce atmospheric turbulence and mixing that would result in elevating ambient (wind) noise levels in general and would be difficult to separate out event noise.

The Watson report states that an in-valley inversion condition may develop on clear to partly cloudy nights from May through September. Inversion refers to an atmospheric condition that can develop in the evening or nighttime hours during warm weather when the earth begins to cool. Air near the surface, especially in sheltered valleys is cooled at a greater rate than air aloft. This condition results in sound rays bending towards the ground and thus may increase noise levels at distant receptors. However, Mr. Watson states that in-valley inversions would only weakly penetrate the top of the valley. We would not anticipate that low-level inversions would affect noise levels at homes on top of the ridges.

Crowd Noise

Crowd noise is assessed based on test data for an outdoor venue of smaller size than the proposed Black Dog venue. Crowd noise was measured during a Merril Haggard concert at an outdoor venue in the summer of 1999 (Oakwood Lake EIR in Contra Costa county, California, 8pm to 10:30pm on July 20, 1999). Based on an estimated attendance of two thousand, crowd noise was between 70 and 75 dBA at 110 meters from the grandstand. With an upward adjustment of 10 dB for an anticipated maximum attendance of 19,500 and including distance attenuation, crowd noise at the nearest homes at Overlook Drive of the City of Bloomington

overlooking the amphitheater is predicted in the range of 60 to 65 dBA. This is consistent with other studies and analysis of crowd noise for which we are familiar.

For a "typical worst case" condition, it is likely that at times (e.g. with the largest occupancy and downwind conditions) crowd noise will exceed the L10 and L50 noise limits for residences in the City of Bloomington to the north and northeast of the amphitheater. Crowd noise is expected to be within the limits for homes on the south side of the Highway 13 in the City of Burnsville due to much larger setbacks from the amphitheater and the orientation of the venue, except for a down wind condition for the maximum seating capacity. The degree to which crowd noise is audible above the ambient, or exceeds any criteria would depend on the actual statistics of the crowd size, the noise that they generate, and the weather conditions.

Traffic Noise

We have reviewed traffic projections with and without the project prepared by BRW. The projected noise level increases due to the additional traffic that the project will introduce on the highway system are summarized in the following table. We address noise level changes during both inbound (7-8pm) and outbound (10:30 – 11:30pm) conditions. Our analysis is limited to traffic increases along Highway 13 and Highway 35; these are the primary roadways used to access the site.

Noise levels during the prescribed times would increase between 0.3 and 1.8 dB due to project generated traffic. Noise level increases of 1 dB are imperceptible by the human ear. A 3 dB increase is generally considered the threshold of audibility for environmental noise. Traffic generated noise would fall at most in the barely perceptible category and would not exceed the 3 dB threshold of significance. Therefore traffic-generated-noise would not result in a significant environment impact as such mitigation would not be required.

		Peak Hour Traffic		**Noise Level**
		with project	**w/o project**	**Increase dBA**
Highway 13 –	Inbound (7-8pm)	2940	2410	0.9
West of CR5	Outbound (10:30-11:30pm)	1800	1195	1.8
Interstate 35 –	Inbound (7-8pm)	7100	5800	0.9
North of 113th	Outbound (10:30-11:30pm)	4720	3320	1.5
Interstate 35 –	Inbound (7-8pm)	6590	6130	0.3
South of 113th	Outbound (10:30-11:30pm)	4250	3080	1.4

RECOMMENDATIONS

Based upon our analysis of the acoustical conditions related to the proposed Black Dog Amphitheater we recommend that the following noise mitigation and monitoring strategies be required of the developers by the City of Burnsville:

1. Permanent House Sound System

A permanent house sound system consisting of 'flown' central loudspeaker clusters covering seats under the extended roof canopy be design utilizing high directional loudspeakers aimed directly down toward the audience. Likewise, loudspeakers covering the audience on the seating berm beyond the canopy also be highly directional, and distributed throughout the seating area, to minimize excessive throw of sound energy.

2. Touring Groups Sound System

All touring groups sound systems should be 'flown' using available rigging provided by the amphitheater and aimed down toward the audience. Other specifications may be developed by the Amphitheater owners for users to follow which could become part of the rental contract for each use. This includes fines for non compliance.

3. Rules and Regulations

A set of guidelines, rules, and regulations should be developed and documented for the purpose of clearly stating the owner's concern for excessive noise and its control. The purpose, means, and controls should be described.

4. The Building Structure

The back-of-house support building should be constructed of heavy, massive materials (min. 10-20 psf) as large and encompassing as possible to help shield the City of Bloomington residences from as much sound energy as possible.

5. The Roof/Canopy

A roof/canopy constructed of a solid, dense material, at least 6-10 psf, should extend from the back-of-house building, as far and as low as possible; and be connected directly to the side walls of the facility.

6. Sound Absorbing Material

A sound absorbing insulation material at least equivalent to the sound absorption efficiency of R-11 or R-19 batt insulation should be applied directly to the underside of the roof/canopy to help control excessive loudness, liveness, reverberation, and long delayed reflections. A suitable aesthetic, visual, sound transparent facing could be designed and detailed at the appropriate time.

7. The Facility Enclosure

The rear wall of the facility, and the parking lot(s) and berms beyond the near most seating should be as high as possible, minimizing the amount of sound that escapes between the end of the roof/canopy, and the highest point at the rear of the facility.

8. Noise Monitoring System

A permanently installed noise monitoring system should be operated automatically during each and every concert event. Maximum sound level limits should be established at the sound control/mix position within the amphitheater and at a few key perimeter locations at the outskirts of the facility. Sound checks prior to each event which include our staff representative should occur. Commercially available noise monitoring systems are readily available which will provide immediate feedback to the sound operator, so that adjustments to the amplified sound levels could be made in real time. Additionally, data would be accumulated and documented for archival purposes, and for enforcement of any fines levied for exceeding stated maximum sound level limits.

Please do not hesitate to call if you have any questions.

Sincerely,

PAOLETTI ASSOCIATES INC.

Dennis A. Paoletti

Dennis A. Paoletti, FAIA
dpaoletti@paolettiassociates.com

DAP/lfs

Encl: APPENDIX A: 6,7 January Measurement Program Methodology

APPENDIX A

6, 7 JANUARY MEASUREMENT PROGRAM/METHODOLOGY

On Thursday and Friday, 6 and 7 January we conducted a series of acoustical measurements at the site of the proposed Black Dog Amphitheater in Burnsville, MN.

Although the conditions were not ideal, technically, or environmentally, we believe that the primary objectives of the measurement program were accomplished. The primary purpose of the measurement program was to assess the potential impact, if any, of sound from a simulated music event at the amphitheater at the closest residences to the north, behind the facility, in the City of Bloomington.

High levels of music were amplified at the former quarry site of the proposed amphitheater using a high powered touring sound systems (representative of the type used by many touring groups). The sound levels were measured at a number of locations in and around the proposed amphitheater site.

The amphitheater is proposed to be located in a depressed area formed by previous limestone/ quarry operations. The orientation of the stage is towards the southeast, away from the Bloomington residences. The natural profile of the amphitheater (depressed stage and seating area) helps to protect the audience from potential "external" sound intrusions (except aircraft flyovers), and also helps to minimize sound exposure from the amphitheater to the surrounding community.

The addition of a canopy structure extending above and beyond the stage, and any berm and enclosing rear wall would further provide sound attenuation of music at the amphitheater by helping to contain/enclose the sound.

The intent of this measurement program was not to perform an exhaustive prediction of potential noise contours based on calculations. It was to take a more practical approach. The primary concern for potential noise impact were residences on the hill behind the proposed amphitheater in the City of Bloomington. The terrain profile to the north, between the proposed amphitheater and the residents, is most unusual, and cannot simply be modeled acoustically.

The measurement program conducted on the 6th and 7th of January consisted of evaluating the propagation of noise in and around the proposed amphitheater site via setting up an actual loudspeaker system, similar to what would be expected – in terms of sound level and power, at the assumed stage location and playing high levels of music through the system.

The music selection chosen was from a Carlos Santana CD. The music segment of a few minutes in length was repeated over and over again for consistency and benchmarking purposes. The music segment was played so that 105 dBA was measured at a location approximately 120 feet in front of the loudspeakers, which was assumed to be where the sound control position would be located during an actual event. 30,000 watts of amplifier power were available via a portable generator to deliver this sound level. There is no question that the sound level of the music played was "extremely loud", and conformed to some of the loudest music expected to be delivered during any event. However, it is conceivable that some group(s) could exceed this level. Although it is my understanding that the developer will make every effort to incorporate all of the noise control recommendations noted in this report. We would not expect the sound level during a concert to always be at the intensity as we played for our tests.

The loudspeaker set up, and measurement program represented what we believe to be a "typical" worst case for a high level amphitheater rock music event.

Note: It should be stated that our attention in planning the measurements was so focused on the residents to the north of the proposed amphitheater site, that we were not aware of the potential impact on certain residential communities to the south in Burnsville. Apparently, our lack of attention resulted in a number of residences in Burnsville that could clearly hear the amplified music.

CONDITIONS AFFECTING AUDIBILITY

1. Loudspeaker Orientation

The loudspeaker cabinets were mounted on tables, and directed towards the south/southeast (Burnsville) at zero degrees to the horizontal. This allowed the high levels of repetitive music to travel, literally unattenuated, (except for atmospheric distance absorption) towards residential areas of Burnsville. Some sound energy reflected off the sloped ground in front of the loudspeakers, and the natural rocky walls to the sides of the "bowl" which bounced back towards the residences in Bloomington. This was heard as a multiple reflection and a blurring of the music at some of the residences in Bloomington, especially off axis of the loudspeakers. (Note: this is a condition which can be heard subjectively, but not discerned from sound pressure level measurements or L_{10} values).

The permanent "house" loudspeaker system must be carefully designed for the amphitheater. All loudspeakers should be located ("flown") approximately 30± ft. high and aimed down towards the audience. This will help to keep sound energy from being directed out of the amphitheater into the surrounding community. (It would also allow the same sound pressure level to be delivered at the audience via less power). Even touring groups who bring their own loudspeaker

systems should be required to fly them from some rigging structure, so that they are aimed downward toward the audience. This could be written into contracts as a house policy. It is anticipated that there would be a set of loudspeakers located directly above the stage, under a solid canopy/roof structure, that would cover the audience seated under the canopy enclosure; and that there would be a series of pole type structures distributed beyond the canopy/roof, which would house loudspeakers, amid downward, for audience seated on the grassy berm areas.

2. Lack of a Building/Roof Structure

The proposed amphitheater would consist of a substantial architectural building structure. Surrounding a stage would be a solid "back of house" structure, enclosing side walls and a solid overhead canopy which would serve as a roof. This architectural structure must enclose the stage and audience as much as possible. Furthermore, the addition of an efficient sound absorbing material on the interior surfaces of the canopy/roof, and enclosing side walls would further help to reduce the reflected energy produced from the stage.

Based on our practical experience with a number of similar conditions regarding the control of exterior sounds, we are of the opinion that this building/canopy/roof structure will provide at least 10 dB of attenuation which was not apparent during our measurement program. During preliminary setup and testing, we modeled this attenuation via graphic equalization at the loudspeakers, and experienced the results at the residential area in Bloomington. The results were dramatic. However, the amphitheater owners elected not to include this attenuation in the Friday evening demonstration. Clearly, what was heard Friday evening, was not represented of the actual sound level(s) that would be emitted from the actual amphitheater.

3. Landscaping/Rear Wall/Berms

The proposed amphitheater is expected to be extensively landscaped. Unlike the present condition of the site, which is barren, relatively smooth, (and frozen during our measurements), we understand, and recommend that grass, bushes and trees be used as much as possible in and around the facility to help attenuate sound. Furthermore, the large parking areas beyond the audience seating areas towards the south can be terraced, and bermed and/or walled to present some additional barrier effect to the sound originating at the stage. The upper most elevation of the parking/property enclosing wall should extend as high as possible, attempting, conceptually to "enclose" the facility as much as possible. Approximately 6-10 dB of sound attenuation could be expected from this treatment, depending upon the actual design. At least 7 dB of attenuation is a realistic expectation for planning purposes.

4. Sound propagation outdoors (distance, air absorption, and wind)

Sound propagation outdoors, especially related to the property profile between the proposed amphitheater stage area, and the closest residences in Bloomington, rarely conforms to classic models. Often referred to as "anomalous propagation", these factors are easily understood in conceptual terms however, practical prediction in a real world situation is virtually impossible, especially being able to predict when, how often, or in what combination they may occur.

5. Distance

In general, sound produced from a localized source, e.g. a stage, radiates spherically as it travels away from the source. The sound pressure level drops off as a function of distance i.e. "universal square law", or 6 decibels (dB) per doubling of distance. The amount of attenuation as a function of distance can be impacted by atmospheric conditions, elevation, and terrain.

The affect of distance (and air absorption) was experienced during our demonstration.

6. Air absorption

Air absorbs sound energy depending on the temperature and humidity of the air. The amount of sound absorbed by the air is frequency dependent. At high humidity levels, sound propagation at frequencies above 500 Hz falls off sharply, thereby significantly reducing annoyance levels.

Our measurements, by necessity, were conducted in January. The weather was cold, clear and crisp. The temperature was in the range of 0-20°F. The humidity was approximately 75%. During the warmer months, when the amphitheater is in operation, the temperature may be in the range of 60° or 95° F; and the humidity may range from 60% to often 90%, or higher. The higher the atmospheric absorption, the greater the reduction of sound energy.

7. Wind

Wind is one of the most variable and difficult conditions to evaluate. When wind blows in the direction of a "receiver" from a source, the sound will be carried in that direction, often increasing the apparent sound level perceived by the listener. However, along with this increased source level, is an increase in the ambient due to other sources, also being carried in the same path. As winds blow, distant traffic noise from freeways, as well as levees in the surrounding local tree and vegetation will rustle, raising the surround ambient.

Excessive turbulence and gusts, although unpredictable, could also impact local audibility conditions. These conditions could appear and disappear within seconds.

During our measurement program we experienced low level wind conditions that varied from the northwest, and also from the south.

MEASUREMENT RESULTS

Our measurements consisted of a series of recorded and direct read values of a number of representative samples of sound levels taken during the course of our 2 day visit. Sample times were relatively short, by necessity, sometimes only a few minutes. This was especially true during the actual, formal, demo period Friday evening, when we traveled from home to home with an entourage of a half dozen cars, and about a dozen people.

We list below the measurement results with the music on* compared only to the nighttime criteria since that is the most stringent criteria.

	Exceedance of Nighttime Criteria (10 pm – 7 am)	
	L_{10} (55)	L_{50} (50)
Bloomington Residences		
- 2833 Overlook Circle	-	-
- 2501 Sherwood Circle	-	-
- 2257 Overlook Circle	-	-
- 11024 Glen Wilding	-	-
- 11010 Humboldt	(skipped)	(skipped)
- 10769 Hopkins Circle	+2.2	+2.8

Although, at times, the music being played at the proposed amphitheater during the demo might have been audible, at certain residential sites in Bloomington, it did not exceed the State standard, except for the last residence we visited at 10769 Hopkins Circle where the ordinance was exceeded by 2-3 dB. The ambient was exceeded by approximately 6 dB. The results at this location took us completely by surprise. We cannot account for the results at this time. We were not made aware of the residences east of Highway 35 in advance of our tests and hence, we did not have an opportunity to visit the locale prior to our test. During the test we were led down a long trail in the dark to our measurement position. In the dark, we could not see where we were relative to the amphitheater site. However, as mentioned above, the actual sound levels expected during an amphitheater event are expected to be lower than demonstrated, by more than 3 dB.

Burnsville Residences	L_{10} (55)	L_{50} (50)
- Meadow Brook Village		
w/music on	+8-10	+10
existing ambient (w/music off)	+6-8	+7-9.5
music above ambient	+2	+2
- 1124 Vista Drive		
w/music on	+5	+5
existing ambient (w/music off)	+1	0/+4
music above ambient	+4	1/+5

* These values include no attenuation due to noise control designed into the amphitheater structure/enclosure, or loudspeaker system.

The music being played at the highest level was clearly audible at many locations in Burnsville. Due to the focus of attention for this measurement program towards the Bloomington residents, there was no consideration given during these tests to "protect" or buffer sound transmission on axis of the amphitheater towards the Burnsville community to the southeast.

In the spring and summer, when the amphitheater would be in use, there should be substantial ground cover and vegetation between the amphitheater and the Burnsville residents. Acoustical insulation placed on the underside of the canopy/roof; and a well designed loudspeaker system with loudspeakers oriented down at the audience, not directly out to the community as was done for our tests, will further help to minimize sound transfer towards the south. The enclosing perimeter of the back of the audience seating area and the canopy extending over the front portion of the audience area is expected to be designed so as to minimize the effective opening/aperture for sound to escape to the community south of the facility. It is our opinion that a minimum of 6-10 dB of sound attenuation would result from the design features we are recommending.

GENERAL COMMENTS

1. Traffic Noise

Our study did not include analysis of traffic noise. From a noise standpoint, the additional traffic created by the amphitheater patrons on the local traffic arterials is not of the magnitude to have a significant effect on the existing ambient levels in any of the neighborhoods surrounding the amphitheater. In fact the amphitheater site already has its own exit from Highway 35. The entry/exit locations and internal circulation are well laid out on a very large site. Most

circulating traffic in connection with the amphitheater use would be at very slow speeds, and would not represent a noise impact to surrounding neighborhoods.

As far as increased traffic flow on Highways 35 and 13, and other local traffic arterials, the normal expected increase in flow due to increases in population and construction, can be expected to raise the general ambient slightly (approximately 2-3 dBA) and therefore be useful in further masking other "foreign" noises, such as any activity noise emanating from the amphitheater site.

2. Parks/Wildlife Refuge

The effects of noise on wildlife is not well understood. We visited some park areas and wildlife refuge areas during our measurement program. Under most conditions, music was not audible. With the wind blowing downwind of the amphitheater, music was audible at the Black Dog Park on Cliff Road at Nicollet Avenue to a maximum of 5 decibels* (dBA) above the ambient. With proper noise control features built into the amphitheater structure/enclosure, and the loudspeaker system, the music should not be audible at this park/refuge site.
At the wildlife refuge behind the berm to the north of the wildlife refuge, the music was audible by up to 8 to 10 decibels* (dBA) above the ambient. Once again, with proper noise control techniques built into the facility, this level would be reduced substantially.

We understand there may be other concerns in the parks having to do with impacting the quietude and enjoyment of the visitors/users. However, there is a great deal of documentation indicating that the use of the amphitheater, in the evenings (after 10 pm, when the noise criteria is most stringent) would not generally be in conflict with the use of the parks.

3. Monitoring Sound Levels

It is fairly common for outdoor amphitheater facilities to incorporate a permanent, built-in, sound monitoring system which would automatically and continuously monitor the sound level produced within the facility.

Inconspicuous, but strategically placed microphones (e.g. at the sound control position, and/or at perimeter boundary conditions would detect when sound levels exceeded predescribed maximum limits. Computerized electronics would document any exceedance, and signal the sound operators. This is a way to guarantee continuous monitoring and commitment to not exceed prescribed agreed upon maximum levels within the amphitheater.

* These values includes no attenuation due to noise control designed into the amphitheater structure/enclosure, or loudspeaker system.

4. Crowd Noise

We did not have a realistic sample of crowd noise to play during our testing program. Crowd noise is one of the most variable parameters to evaluate. It is transient in nature; spontaneous; and fluctuates greatly, occasionally reaching peaks in excess of 100 dBA within the amphitheater seating area. Crowd noise data and statistics are not known.

At the distance of approximately ½ mile, on flat unobstructed terrain, crowd noise may reach instantaneous peaks of 60-65 dBA. The L_{10} and to a lesser extend the L_{50} could be impacted by these discrete events, depending how often they occur. Any form of architectural obstruction between the audience and the recipient location, would act as a barrier and have some sound attenuating affect towards reducing the level of crowd noise.

RECOMMENDATIONS

Based upon our analysis of the acoustical conditions related to the proposed Black Dog Amphitheater we recommend that the following noise mitigation and monitoring strategies be required of the developers by the City of Burnsville:

1. Permanent House Sound System

A permanent house sound system consisting of 'flown' central loudspeaker clusters covering seats under the extended roof canopy be design utilizing high directional loudspeakers aimed directly down toward the audience. Likewise, loudspeakers covering the audience on the seating berm beyond the canopy also be highly directional, and distributed throughout the seating area, to minimize excessive throw of sound energy.

2. Touring Groups Sound System

All touring groups sound systems should be 'flown' using available rigging provided by the amphitheater and aimed down toward the audience.

3. Rules and Regulations

A set of guidelines, rules, and regulations should be developed and documented for the purpose of clearly stating the owner's concern for excessive noise and its control. The purpose, means, and controls should be described.

4. The Building Structure

The back-of-house support building should be constructed of heavy, massive materials (min. 10-20 psf) as large and encompassing as possible to help shield the City of Bloomington residences from as much sound energy as possible.

5. The Roof/Canopy

A roof/canopy constructed of a solid, dense material, at least 6-10 psf, should extend from the back-of-house building, as far and as low as possible; and be connected directly to the side walls of the facility.

6. Sound Absorbing Material

A sound absorbing insulation material at least equivalent to the sound absorption efficiency of R-11 or R-19 batt insulation should be applied directly to the underside of the roof/canopy to help control excessive loudness, liveness, reverberation, and long delayed reflections. A suitable aesthetic, visual, sound transparent facing could be designed and detailed at the appropriate time.

7. The Facility Enclosure

The rear wall of the facility, and the parking lot(s) and berms beyond the near most seating should be as high as possible, minimizing the amount of sound that escapes between the end of the roof/canopy, and the highest point at the rear of the facility.

8. Noise Monitoring System

A permanently installed noise monitoring system should be operated automatically during each and every concert event. Maximum sound level limits should be established at the sound control/mix position within the amphitheater and at a few key perimeter locations at the outskirts of the facility. Sound checks prior to each event which include our staff representative should occur. Commercially available noise monitoring systems are readily available which will provide immediate feedback to the sound operator, so that adjustments to the amplified sound levels could be made in real time. Additionally, data would be accumulated and documented for archival purposes, and for enforcement of any fines levied for exceeding stated maximum sound level limits.

* * *

Assuming that the proposed Black Dog Amphitheater is constructed and operated as proposed, and all of the attenuation measures listed above are employed, we believe that the Minnesota Pollution Control Agency Noise Standards would not be exceeded at either residences to the north in Bloomington; or at residences to the south in Burnsville, except as noted in the study above.

Table 1 – Predicted Sound System Noise

Receptor	Calm & Neutral Weather Condition		Upwind Condition (-3 to – 10 knots)		Downwind Condition (3 to 10 knots)		Too windy (in excess of 10 knots)	
	% of the time occurring	L10 Noise Level dBA	% of the time occurring	L10 Noise Level dBA	% of the time occurring	L10 Noise Level dBA	% of the time occuring	1.10 Noise Level dBA
1- Bloomington residences on Overlook Cir. North- west of the amphitheater	66	56	4	51	22	66	8	See Note 1
2- Bloomington residences on Hopkins Rd. North-east of the amphitheater	53	49	3	42	36	56	8	See Note 1
3- Burnsville residences on Vista Dr. South of the amphitheater	59	49	30	43	3	56	8	See Note 1
4- Burnsville Meadowbrook Village South-east of the amphitheater	66	50	4	43	22	57	8	See Note 1

Notes:

1- *Noise levels under high winds (greater than 10knots) are difficult to predict with statistical accuracy. Winds would result in large and rapid fluctuations due to atmospheric turbulence and wind generated noise.*

2- *L50 noise levels can be estimated at 5 dB less than the tabulated L10 levels. This is based on review of noise measurement results for similar types of projects.*

3- *Residential noise limits imposed on this project are L10 not to exceed 55 dBA and L50 not to exceed 50 dB for nighttime hours (10pm to 7am). Daytime limits are 10 dB less restrictive.*

Wind and Temperature Structure at the Proposed Wild Amphitheater Site

Report to Sterns & Associates

28 March 2000

By Bruce F. Watson
Consulting Meteorologist

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Figure 2 - Concert Wind Rose Diagram

1. INTRODUCTION

This report describes the wind and temperature structure of the proposed site of an amphitheater to be built in the Minnesota Valley just upstream from the Interstate 35W river bridge.

Wind analyses are presented for the year as a whole, including all times of the day and all days of the year; and for the times most likely for concert times at the amphitheater. For each, a table is presented, as well as a diagram representing each. Temperature structure important to sound propagation is discussed for concert times.

2. WILD AMPHITHEATER BASE WIND CLIMATOLOGY

A base wind climatology of the Wild Amphitheater site was done for this study using a model that I constructed in the 1980s. I have applied this model to various sites for numerous clients since then. The model ***base*** consists of a wind rose representative of the undisturbed wind climatology of eastern Minnesota - western Wisconsin, which is then ***modified*** to specific sites by input values derived from topographical and other natural perturbing influences.

The figure shows the results of the application of the model to the Wild site. The diagram is called a ***wind rose.*** It shows the percent frequency of winds ***from*** each of sixteen directions and in five cumulative wind speed categories. This means there are 16 x 5 = 80 categories altogether. The values of the frequency of each of these 80 wind direction/speed categories is given in the table.

Two prominent features of the wind climatology of the site is the high preponderance of low wind speeds compared to most places in Minnesota and the very prevailing direction from the west-southwest. The low speeds are caused by the strong buffing of the wind speed by the valley walls. The prevailing west-southwesterly directional bias is due to drainage of chilled, denser air downvalley from dusk to sunrise on so many nights.

This wind information is for the year as a whole. Wind directions and speeds during concert times are discussed in the **OPERATION-TIME WIND-TEMPERATURE STRUCTURES** section of this report.

KNOTS	NORTH	NNE	NE	ENE
0-3	1.87	0.83	0.54	0.36
4-6	2.58	2.05	1.44	1.69
7-10	0.29	0.98	1.17	1.74
11-16	0.05	0.08	0.2	0.63
17+	...	...	...	0.04

KNOTS	EAST	ESE	SE	SSE
0-3	0.35	0.78	1.02	1.99
4-6	0.74	1.49	2.41	4.14
7-10	0.49	0.78	1.13	1.75
11-16	0.15	0.06	0.1	0.08
17+	...	...	...	...

KNOTS	SOUTH	SSW	SW	WSW
0-3	1.56	0.36	0.27	1.06
4-6	4.67	1.86	1.86	5.75
7-10	3.73	2.65	2.92	5.6
11-16	0.42	1.08	1.4	0.46
17+	...	0.06	0.2	0.26

KNOTS	WEST	WNW	NW	NNW
0-3	0.61	1.7	3.04	4.38
4-6	2.26	3.99	4.91	2.77
7-10	1.58	2.38	0.78	0.15
11-16	0.62	0.4	0.18	...
17+	0.05	0.02	0.02	...

PERCENT WIND FREQUENCY ATWILD AMPHITHEATER
VALUES WOULD ADD UP TO 100% EXCEPT FOR ROUNDING

TABLE ON - ANNUAL WIND ROSE : ALL TIMES

3. TEMPERATURE STRUCTURE

The temperature structure of the Wild Amphitheater Site is much different than that of most of east-central Minnesota. This is because the amphitheater site lies is in a deep, unique valley.

The temperature structure is created largely by the unique deep trough that extends from the Mississippi River through the site and upvalley to and even past Mankato. This trough was carved on the order of 10,000+ years ago by vast rushes of melting glacial ice in the summertime. Once the ice was gone, the valley became dry year-round except for the tiny river that trickles through from Brown's Valley to its mouth at Fort Snelling.

The valley walls cause a partial "disconnect" from the surrounding atmosphere. Air moving across the prairie above do not tend to "drop down" into the valley, but tend to move over it. Air between the valley walls is already there, and only partly mixes with air moving over. On a hot summer day, valley temperatures run significantly hotter than on the prairie above.

From dusk to dawn, valley air is much more stable than the air on the prairie above. Valley air is chilled and densified as it contacts the cooling surface of the valley walls, and driven by gravity, flows down the walls, and then downvalley in the direction of Fort Snelling.

As a result, in-valley temperature inversions are the rule at least part of those clear to partly-cloudy nights with wind speeds over the prairie that are under 7 knots.

4. OPERATIONAL-TIME WIND-TEMPERATURE STRUCTURES

Let us now look at the temperatures and wind structures expected to occur at times when the Wild Amphitheater is in use.

It is intended that the Amphitheater will be in use primarily on summer weekend evenings. More specifically, use will be mainly on Friday and Saturday evenings between 7:00 PM and 10:30 PM, Central Daylight Time (CDT), or 6:00 PM to 9:30 PM, Central Standard Time (CST), from May through September.

Sunset occurs at 8:19 PM CDT on May 1, is at its latest at 9:03 PM on July 2, and backs up to 6:64 PM on September 30. These times are noteworthy since air drainage flow will begin around sunset or shortly thereafter about 25% of the time that an event is being held. About 50% of the time, air drainage flow can be expected by 10:30 PM, CDT.

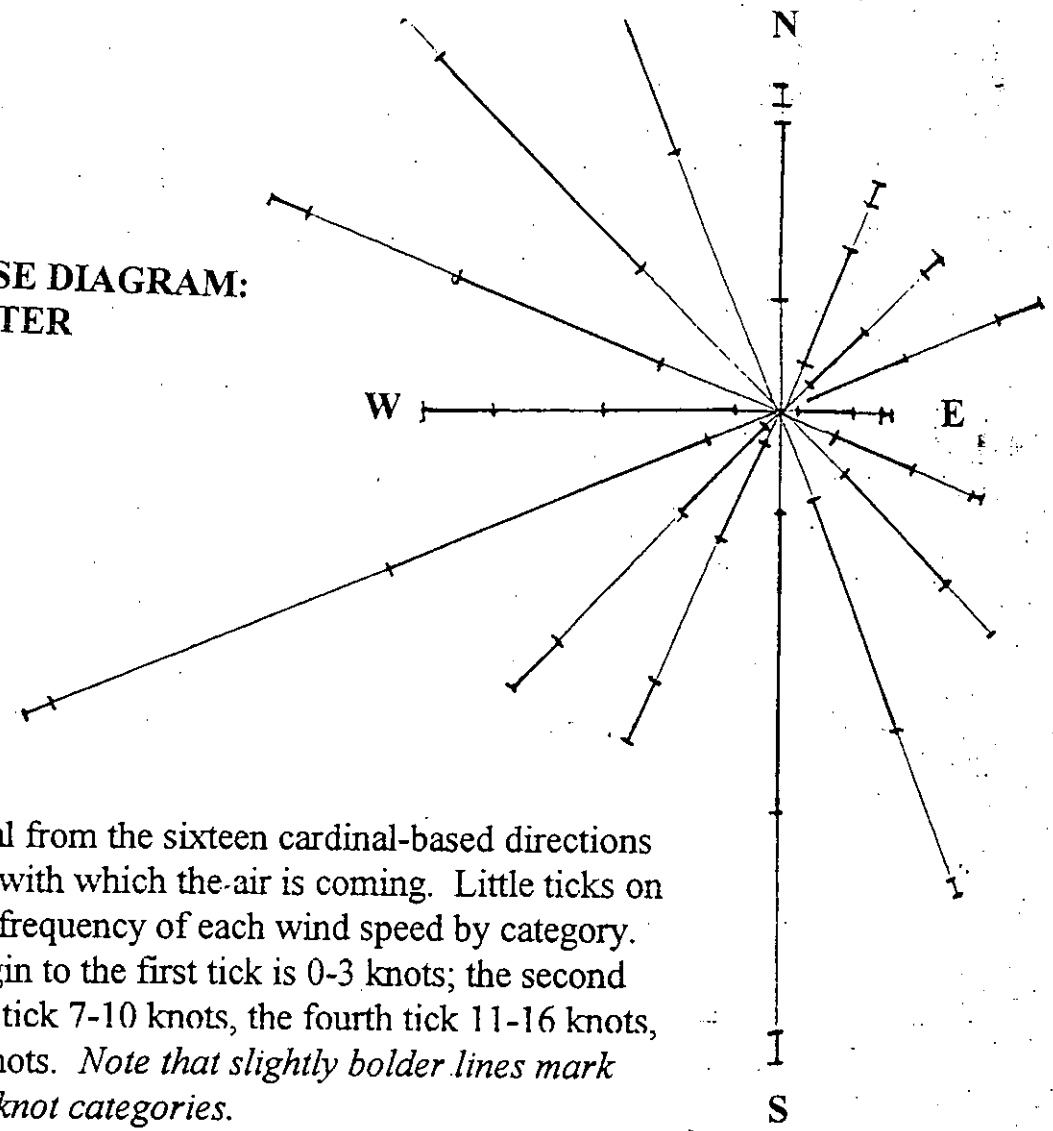
When air drainage is occurring, an in-valley inversion will occur. Recall that this is a situation in which the temperature will be cooler at amphitheater level than at the top of the valley. Such a situation should lead to amphitheater-generated sound echoing around the valley, and only weakly penetrating the top of the valley. Those on top of the valley may well hear more sound from the freeway traffic than from the concert.

From May Day through September, the air over the valley can be expected to be stable, though not an inversion, an additional 60% of the time at 7:00 PM CDT and an additional 45% of the time at 10:30 PM Thus, the air would be either an inversion or stable 85% of the time at 7:00 PM CDT and 95% of the time at 10:30 PM CDT. Differences over the period would not be great, since the sun will be out of the scene, or way down near the horizon, the entire time after 7:00 PM, CDT.

Winds would be more frequently from the west-southwest at these concert-times than would be the case for the Annual Wind Rose, since air drainage occurs most often in the hours of shadow and darkness. All-in-all, winds between southwest and west should blow about 35% of the time when concerts are occurring. Many of these may be perceived to be calm since the air will often be moving at less than one mile per hour. Air drainage winds may often come from other directions, mainly the south, because of perturbations wrought by a myriad of conditions. Even in such situations, sound-conducting flow ***from*** the Amphitheater, will be ***toward*** the east-northeast for the most part.

The second table gives the frequency of winds during concert times only, from 7:00 PM to 10:30 PM from May through September, according to 80 categories of wind speed/direction.

ANNUAL WIND ROSE DIAGRAM: WILD AMPHITHEATER



The length of each radial from the sixteen cardinal-based directions indicates the frequency with which the air is coming. Little ticks on each radial indicate the frequency of each wind speed by category. Frequency from the origin to the first tick is 0-3 knots; the second tick 4-6 knots, the third tick 7-10 knots, the fourth tick 11-16 knots, and the fifth tick 17+ knots. *Note that slightly bolder lines mark the 4-6 knot and 11-16 knot categories.*

KNOTS	NORTH	NNE	NE	ENE
0-3	0.66	2.02	1.19	1.95
4-6	0.21	0.58	0.35	0.54
7-10	0.09	0.23	0.16	0.3
11-16	0.03	0.05	0.05	0.15
17+				0.06

KNOTS	EAST	ESE	SE	SSE
0-3	0.88	0.43	1.51	4.94
4-6	0.32	0.18	1.31	4.94
7-10	0.15	0.08	1.16	2.39
11-16	0.05	0.02	0.04	1.36
17+			0.02	0.33

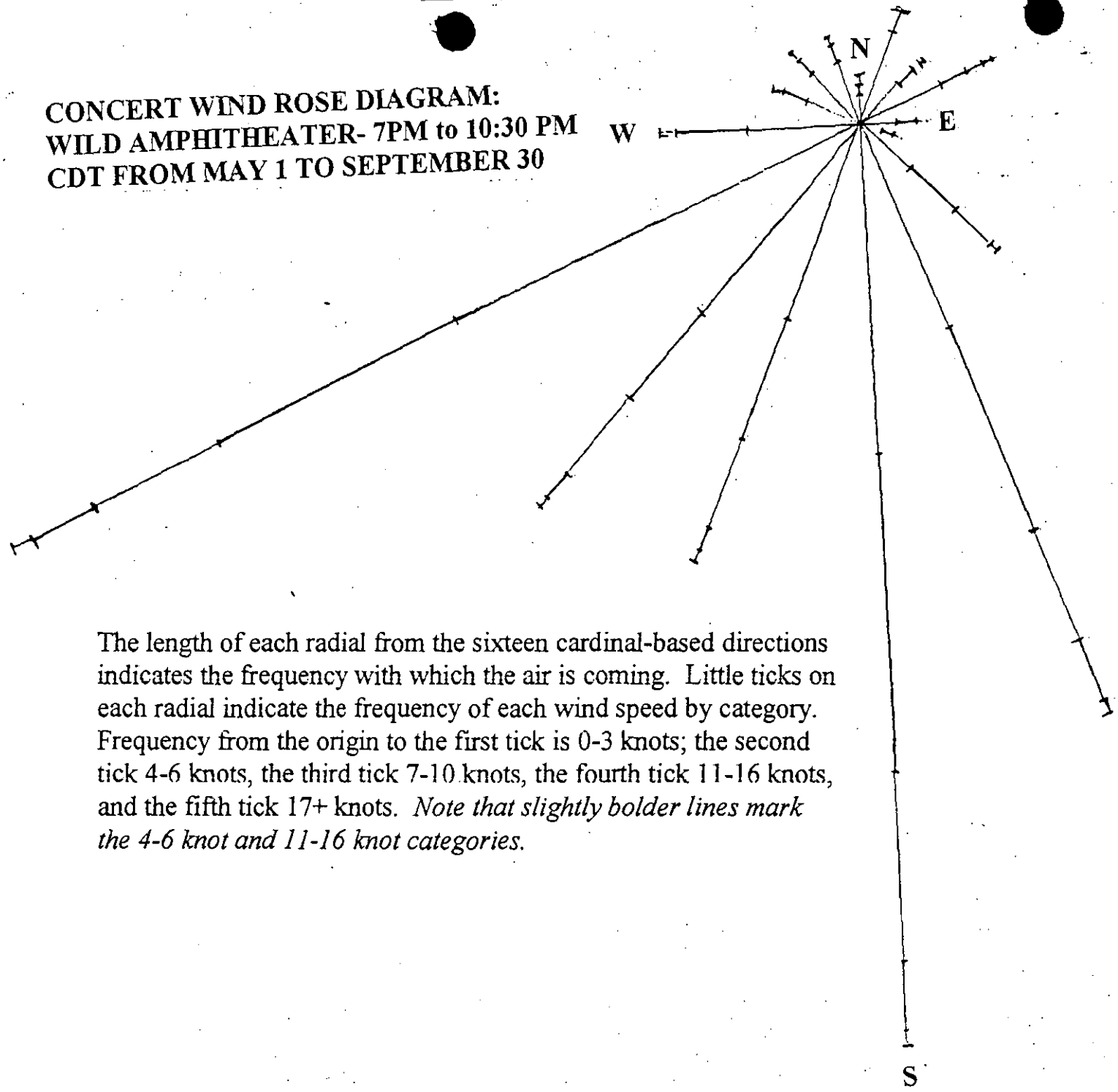
KNOTS	SOUTH	SSW	SW	WSW
0-3	7.31	4.5	5.32	9.84
4-6	6.93	2.8	2.46	5.54
7-10	4.08	2	2.13	3.08
11-16	1.63	0.5	0.53	1.43
17+	0.43	0.21	0.21	0.61

KNOTS	WEST	WNW	NW	NNW
0-3	2.48	1.21	1.44	1.3
4-6	1.45	0.51	0.44	0.33
7-10	0.17	0.11	0.12	0.13
11-16	0.04	0.06		0.03
17+				

PERCENT WIND FREQUENCY AT WILD AMPHITHEATER
DURING CONCERT TIMES (7-10:30 PM MAY-SEPTEMBER)

TABLE 2 - CONCERT WIND ROSE

CONCERT WIND ROSE DIAGRAM:
WILD AMPHITHEATER- 7PM to 10:30 PM
CDT FROM MAY 1 TO SEPTEMBER 30



The length of each radial from the sixteen cardinal-based directions indicates the frequency with which the air is coming. Little ticks on each radial indicate the frequency of each wind speed by category. Frequency from the origin to the first tick is 0-3 knots; the second tick 4-6 knots, the third tick 7-10 knots, the fourth tick 11-16 knots, and the fifth tick 17+ knots. *Note that slightly bolder lines mark the 4-6 knot and 11-16 knot categories.*

25. Nearby resources.

Are any of the following resources on or in proximity to the site?
Archaeological, historical or architectural resources? __Yes _X_No
Prime or unique farmlands or land within an agricultural preserve? __Yes _X_No
Designated parks, recreation areas or trails? _X_Yes __No
Scenic views and vistas? __Yes _X_No
Other unique resources? _X_Yes __No
If yes, describe the resource and identify any project-related impacts on the resource. Describe any measures to minimize or avoid adverse impacts.

The Subject Property has been the site of a limestone quarry and a sanitary landfill for the past twenty years. It does not contain any designated recreation areas, no portion of it is farmed, there are no ecologically sensitive areas, or vistas. Perhaps the only unique resource affected by the proposal would be the limestone that remains within the quarry area.

The PUD also calls for the dedication of parkland along the Minnesota River, the dedication of trails along the River and around the facility, and landscape improvements throughout the site.

On the north side of the Minnesota River, across from the proposed amphitheater site, is the City of Bloomington's River Valley Park. The park runs along the north edge of the river from approximately I-35E on the east to County Road 18 on the west. It includes informal, unpaved biking/hiking trails and boat ramp access to the river. A trail is proposed on the north side of the river that will ultimately connect through the Minnesota Valley National Wildlife Refuge located both east of I35W and west of the subject property.

26. Visual impacts.

Will the project create adverse visual impacts during construction or operation? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks? __Yes _X_No

Portions of the project site will be visible from adjacent properties and roadways. Whereas the project site currently exists in a barren condition, the property will be substantially enhanced upon completion of construction. There will be significant greening of the portions of the site that can be planted upon. There will be perimeter landscaping, in addition to landscaping at key locations throughout the site.

The height of light fixtures on the site will be determined through the PUD process. The City of Burnsville design standards require that all light sources be screened from off-site view. Provisions will be made to ensure that only the amount of light necessary for security purposes will be used at times when events are not being held.

27. Compatibility with plans and land use regulations.

Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency?
_X_ Yes __No. If yes, describe the plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain.

Comprehensive Plan

The City of Burnsville has adopted a 1999 Comprehensive Plan Update. The 1999 Plan designates this area as "Commercial Recreation Business." The Plan specifically discusses the McGowan property in a section that addresses future land use redevelopment, as follows:

> "In 1998, the City, the PCA and the McGowans focused on completing the closure of the landfill and securing a developer for the amphitheater. At the end of 1999, the McGowans entered into an agreement with Rose Wild, LLC with the intention of constructing the amphitheater, scheduled for opening in 2001. To assist in this development, the City is obtaining all necessary permits and approvals and is proceeding with the transportation systems and corridor beautification projects in the Greenway Area."

Additionally, the proposed amphitheater project on the McGowan Property was described in several sections of the 1990 Comprehensive Plan. That plan reflected a land use change for the site from Industrial to Commercial Recreation Business, described both in text and graphic form. Also, the McGowan property was referenced in the plan as one of the largest vacant parcels in the City, describing the approved amphitheater development proposal.

The 1990 Comprehensive Plan Update also discussed Transportation issues related to the proposed amphitheater. The Plan referenced the 1990 Highway 13 Corridor Study, that mentioned planned transportation system improvements, including the closure of several access points and the modification of the Black Dog Road interchange in order to facilitate access to the amphitheater. The 1990 Comprehensive Plan update also listed the Black Dog Road/I-35 and Cliff Road/I-35 interchanges as proposed project changes.

Zoning

The site is zoned I2 General Industrial District, overlain by a Planned Unit Development (PUD) District. The PUD was specifically created to permit the amphitheater on the McGowan property. The site is included in a Tax Increment

Financing (TIF) District to allow for the contribution of public improvements and infrastructure as part of the development.

Flood Plain Regulations

Portions of the site lie within both the Flood Fringe and Floodway Districts, as defined by the Burnsville Zoning Ordinance Floodplain Regulations Sections 10-10-4(b) and 10-10-4(c)7. The proposed amphitheater is located within the limestone quarry portion of the property. Burnsville's Floodplain Regulations permit dikes in the floodway to protect agricultural areas to the 10 year or less frequency, but are required not to increase the 100 year level based on an equal conveyance loss analysis on both sides of the river. This is also a requirement of the Lower Minnesota River Watershed District. Burnsville would need to grant an exception to cover the dikes surrounding the amphitheater. Based on the revised location of the levee system and the amphitheater, and the related hydraulic modeling, the improvements are no longer in the floodway. Some adjacent open space uses north of the new levee will remain in the floodway. Please refer to Figure 12.3 in Section 12.

The proposed use is consistent with the open space, recreational uses that are allowed within the floodplain. Both the MnDNR and the City of Burnsville have found that the amphitheater would be an acceptable use of the site.

The dike surrounding the site, if modified or improved, would consist of fill in a floodplain. By definition, a floodplain is a jurisdictional wetland requiring a USCOE Section 404 permit.

28. Impact on infrastructure and public services.

Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project? _X_ Yes __No. If yes, describe the new or additional infrastructure or services needed. (Note: any infrastructure that is a connected action with respect to the project must be assessed in the EAW; see *EAW Guidelines* for details.)

Public utilities are currently in place at the southern boundary of the property. The PUD plans call for the extension of both sanitary sewer and municipal water service to the amphitheater. Preliminary utility design work has been completed, and the final approval of the project will be conditioned upon the completion of final utility system design and the completion of these improvements.

The proposed development will also be served by a storm sewer system. Preliminary design work has also been completed on this system, which includes storm water detention and retention facilities. Final design work and the construction of this system will also be part of the project approval process.

Please refer to Figure 12.1 and Section 17 for additional information related to the stormwater system.

29. Cumulative impacts.

Minnesota Rule part 4410.1700, subpart 7, item B requires that the RGU consider the "cumulative potential effects of related or anticipated future projects" when determining the need for an environmental impact statement. Identify any past, present or reasonably foreseeable future projects that may interact with the project described in this EAW in such a way as to cause cumulative impacts. Describe the nature of the cumulative impacts and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to cumulative impacts *(or discuss each cumulative impact under appropriate item(s) elsewhere on this form).*

Discussion of cumulative impacts is included in this document under the appropriate sections. It is also included in the adopted Comprehensive Plan.

Impacts to or fill in wetlands occurring during extension of utilities or roadways to the site will be addressed and cumulative impacts assessed in the 404 permit application made to the USCOE. The USCOE Section 404 permit application will assess the following:

- Alternatives to the action, including doing nothing.
- Avoidance of wetland areas.
- Minimization of impacts of the action.
- Mitigation of impacts and losses.

The principal cumulative effect of this project will be the incremental, planned reclamation of the Burnsville river front as described in the Comprehensive Plan. This process will convert the intensive industrial activities in this area to public park, trails, a 300+ acre lake and surrounding clean and quiet businesses. As an interim use, the processing activities that currently exist at the east side of the quarry will be transferred to the west side of the quarry through the PUD process. The life of these processing activities will be tied to the life of the quarry. During this interim period, the land on the east side of the quarry will be used for restaurants and other service activities. When the quarry is ultimately closed and the lake is filled, the interim uses on the east side will be replaced by high valued office, hospitality and service businesses.

30. Other potential environmental impacts.

If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

There are no additional potentially adverse environmental impacts that would be caused by the amphitheater project.

31. Summary of issues.

List any impacts and issues identified above that may require further investigation before the project is begun. 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.

This EAW is an update of a previously approved 1989 EAW for an identical sized facility at the same location. A Negative Declaration Resolution was issued by the Burnsville City Council on December 4, 1989, after completing substantial additional environmental analysis in response to comments received during the extended comment period. The PUD Concept Plan Stage has been approved by the City of Burnsville and is referenced in its 1990 and 1999 Comprehensive Plan updates. In 1991, the property was rezoned to a Planned Unit Development District to accommodate the amphitheater development.

Shortly after the City adopted the 1990 Plan, the applicant's secured all of the necessary local permits to construct an amphitheater on the McGowan property, addressing all impacts on the regional infrastructure. The project was delayed in its construction due to the complications related to its prior use as a landfill and, therefore, some of the required permit approvals lapsed. However, the City of Burnsville never stopped working toward the amphitheater as the preferred end use of the site. Now that a developer has been secured for the site, the City will resubmit its permit applications for approval and work toward the construction of the amphitheater in time for a portion of the 2001 season.

In addition, the City of Burnsville has been working as to resolve the outstanding issues for closure between the State and the owners of the Freeway Landfill. The signing of a Binding Agreement and a Development Agreement are essential for the project to proceed. If the two documents are not signed, the State will not proceed with any construction related to closure of the Freeway Landfill.

During the preparation of the EAW, the City has been in close coordination with a number of agencies to determine, document and address the various agency concerns that exist relative to this project. A list of agencies and their specific issues is as follows:

<u>Minnesota Department of Natural Resources</u>

Mr. Pat Lynch has expressed concern regarding the existence of the levee and the potential for increasing floods upstream of the site. To address the concern, the amphitheater has been shifted to the southern most part of the site. In this location the levees can be relocated without impacting the upstream profiles.

Meetings with Mr. Lynch and the DNR's Jim Solstead confirmed an acceptable approach for analyzing the new levee location. DNR will be reviewing the detailed modeling concurrent with their review of the EAW. As a result of the analysis, the existing levees will be removed and wetland restoration will take place.

DNR permits that will be needed will include a Protected Water Permit and a water appropriation permit for dewatering (future).

United States Army Corps of Engineers

The City has worked closely Mr. Dan Seemon with the Corps of Engineers regarding Nationwide permits for the project (some of which he had already issued) and most recently regarding an alleged violation/illegal fill action against the property owner. The City has presented a concept plan for restoration areas on the site as well as the perpetual protection of adjacent flood plain forest wetland through the Kraemer PUD. The City is awaiting the Corps findings regarding the violation and has offered to develop a City-Corps partnership to ensure that the restoration plan is properly completed and that the restoration is properly established. The City has secured significant financial support from the developer to ensure the success of the restoration.

Issues related to the individual permit for the project will be discussed with an all-agency meeting on site and at the sites of proposed mitigation, to be conducted on May 10, 2000.

In addition, the City has also met with Mr. Pat Foley who will be reviewing the hydraulic modeling for the river to ensure that no increase in flooding, as compared to the existing flood insurance study, will occur as a result of this project. Mr. Foley is already in agreement with the approach taken to perform the analysis. His review will be occurring concurrently with the review of the EAW.

United States Fish and Wildlife Service

USFWS's Nick Rouse met with City representatives to discuss concerns related to the project. Mr. Rouse indicated that his concerns relate to noise generation and to the flooding issues expressed by both the DNR and the USCOE. The flooding issues are completely addressed, pending final agency acceptance of the relocated levee and revised hydraulic model for the river. The noise issue is addressed by the EAW and is subject to final acceptance by MPCA.

Lower Minnesota River Watershed District

City staff met with the District's Larry Samstead to discuss issues for the project.

Mr. Samstead had significant issues with the 1989 EAW relating to the increased potential for upstream flooding as a result of the project and associated levees. Mr. Samstead will be reviewing the revised site location including the relocated levees and the revised river model to concur with the DNR and USCOE that the site will now be out of the floodway and will not increase the flood profile for adjacent or upstream communities.

Dakota County

City representatives have discussed the project with Mr. Brian Watson with the Dakota Soil and Water Conservation District. Mr. Watson has responsibilities related to the State Wetland Conservation Act and will likely be asked to review the permit as a member of a technical evaluation panel (TEP). Based on the discussions, Mr. Watson is very comfortable with the proposed mitigation plan.

Minnesota Pollution Control Agency

On February 29, 2000 City staff met with MPCA staff including Larry Zdon and Gene Soderbeck to discuss water quality and wetland issues for the project. In a follow-up message from Mr. Soderbeck, all requested information and identified issues have been properly addressed in the May draft of the EAW. Mr. Zdon plans on attending the May 10 field walk related to wetland permitting on the site.

Minnesota Department of Transportation

Construction of some of the required supporting roadway system improvements will require the review and approval of the Minnesota Department of Transportation (Mn/DOT). Mn/DOT must approve the proposed improvements to the I-35W/Black Dog Road interchange. The necessary approvals will include a Project Memorandum, approval of the interchange geometric design and approval of the interchange access revision. Approval of the interchange access revision is ultimately required from the FHWA. All of these required reviews/approvals have been initiated; however, the approvals have not yet been obtained. The City of Burnsville is working to resolve issues that have been raised by Mn/DOT. These primarily include environmental issues associated with the landfill closure work and traffic related issues associated with the controls that will be placed on the amphitheater operation.