MINNESOTA SPORTS FACILITIES AUTHORITY

MINNESOTA MULTI-PURPOSE STADIUM

Draft Environmental Impact Statement

April 2013

DRAFT ENVIRONMENTAL IMPACT STATEMENT

For

THE MINNESOTA MULTI-PURPOSE STADIUM

Downtown Minneapolis

Hennepin County, Minnesota

Responsible Governmental Unit (RGU) and Proposer: Minnesota Sports Facilities Authority (MSFA)

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Abstract: The MSFA has prepared a state Draft Environmental Impact Statement (Draft EIS) for the proposed construction of the Minnesota Multi-Purpose Stadium, a new 65,500 seat stadium, with expansion up to 73,000 (maximum), for use by the Minnesota Vikings and other civic and community uses. The Proposed Project includes the Stadium structure and associated infrastructure improvements surrounding the Stadium site. The Stadium site is located from Park Avenue to 11th Avenue and 3rd Street to 6th Street on the current Hubert H. Humphrey Metrodome site.

Draft EIS Public Meeting Date:	May 22, 2013
Draft EIS Public Meeting Time:	5:00 -7:00 PM
Draft EIS Public Meeting Location:	Hubert H. Humphrey Metrodome Halsey Hall Room 900 South 5th Street Minneapolis, MN 55415
Draft EIS Comment Deadline:	June 6, 2013

Approved for Issuance for Public Comment:

4-22-13
Date

Michele Kelm-Helgen, Chair
Minnesota Sports Facilities Authority

April 22, 2013

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† Figure is located in-text.

Executive Summary

Project Description

The Minnesota Sports Facilities Authority (MSFA) has prepared a state Draft Environmental Impact Statement (EIS) for the proposed construction of the Minnesota Multi-Purpose Stadium and related stadium infrastructure (collectively, the "Proposed Project"), a new approximately 65,500 seat stadium, with expansion up to 73,000 (maximum), for use by the Minnesota Vikings and other civic and community uses. The Proposed Project includes the Stadium structure and associated infrastructure improvements surrounding the Stadium site. The new Stadium will be constructed on the current site of the Hubert H. Humphrey Metrodome (Metrodome) and will include demolition of the Metrodome. The Stadium site is located from 11th Avenue to Park Avenue and 3rd Street to 6th Street in downtown Minneapolis, Hennepin County, Minnesota. The new Stadium is proposed to include suites, club seats, shops, restaurants, an NFL team museum, and a Hall of Fame. The Proposed Project also includes stadium infrastructure as defined in the Project Legislation section below.

The Proposed Project being analyzed in this EIS will include the following elements:

- Construction of a new Stadium facility
- Possible retractable elements, such as retractable roof or wall features
- Parking
- Potential closure of 5th Street from Chicago to 11th Avenues
- Stadium infrastructure, including parking facilities and the stadium plaza
- Demolition of the Metrodome

The construction of the new Stadium may take up to 35 months, which will require the Minnesota Vikings to play up to two football seasons at the existing TCF Bank Stadium on the University of Minnesota Campus. The EIS addresses the temporary impacts from the use of TCF Bank Stadium.

Project Legislation

In May 2012, the Minnesota legislature passed and the Governor signed legislation addressing the Proposed Project, now codified at Minn. Stat. Chpt. 473J (Stadium legislation). The Stadium legislation states that the new Stadium to be constructed shall be located at the existing Metrodome site in Minneapolis. This Stadium legislation also states that an EIS for the new Stadium shall not be required to consider alternative sites.

Project components defined in the legislation include:

- **Project boundaries:** The Stadium site for the Proposed Project is defined by the Stadium legislation as "all or portions of the current site of the existing football stadium and adjacent areas, bounded generally by Park and Eleventh Avenues and Third and Sixth Streets in the city of Minneapolis, the definitive boundaries of which shall be determined by the authority and agreed to by the NFL team" (Minn. Stat. § 473J.03, subd. 12). Stadium infrastructure locations may be further located within two blocks of the Stadium site identified in **Figure ES-1** below**.**
- **Project definition:** The Stadium legislation includes the following description of the Proposed Project: "[t]he stadium and stadium infrastructure shall be designed and constructed incorporating the following general program and design elements: (1) unless otherwise agreed to by the authority and the NFL team, the stadium shall comprise approximately 1,500,000 square feet (sf) with approximately 65,000 seats, expandable to 72,000, shall meet or exceed

NFL program requirements, and include approximately 150 suites and approximately 7,500 club seats or other such components as agreed to by the authority and the NFL team; (2) space for NFL team-related exhibitions and sales, which shall include the following: NFL team museum and Hall of Fame, retail merchandise and gift shop retail venues, and themed concessions and restaurants; (3) year-round space for the NFL team administrative operations, sales, and marketing, including a ticket office, team meeting space, locker, and training rooms; (4) space for administrative offices of the authority; (5) 2,000 parking spaces within one block of the stadium, connected by skyway or tunnel to the stadium, and 500 parking spaces within two blocks of the stadium, with a dedicated walkway on game days; (6) elements sufficient to provide community and civic uses as determined by the authority; and (7) a roof that is fixed or retractable, provided that if the roof is retractable, it is accomplished without any increase to the funding provided by the state or the city" (Minn. Stat. § 473J.11, subd. 3).

- **Infrastructure definition:** The Stadium legislation also defines the attendant stadium infrastructure as follows: "Stadium infrastructure means plazas, parking structures, rights of way, connectors, skyways and tunnels, and other such property, facilities and improvements, owned by the authority or determined by the authority to facilitate the use and development of the stadium" (Minn. Stat. § 473J.03, subd. 10).

Alternatives Considered in the EIS

No Action Alternative

As required by Minnesota Rule 4410.2300, the EIS includes analysis of the No Action Alternative. The No Action Alternative assumes continued use of the Metrodome by the Minnesota Vikings. Other uses of the facility would also continue, such as baseball games, concerts, and other civic uses. The Metrodome is approximately 900,000 square feet with a maximum seating capacity of 63,962. The Metrodome is located between 4th and 5th Streets and Chicago and 11th Avenues in downtown Minneapolis, Minnesota.

Preferred Alternative

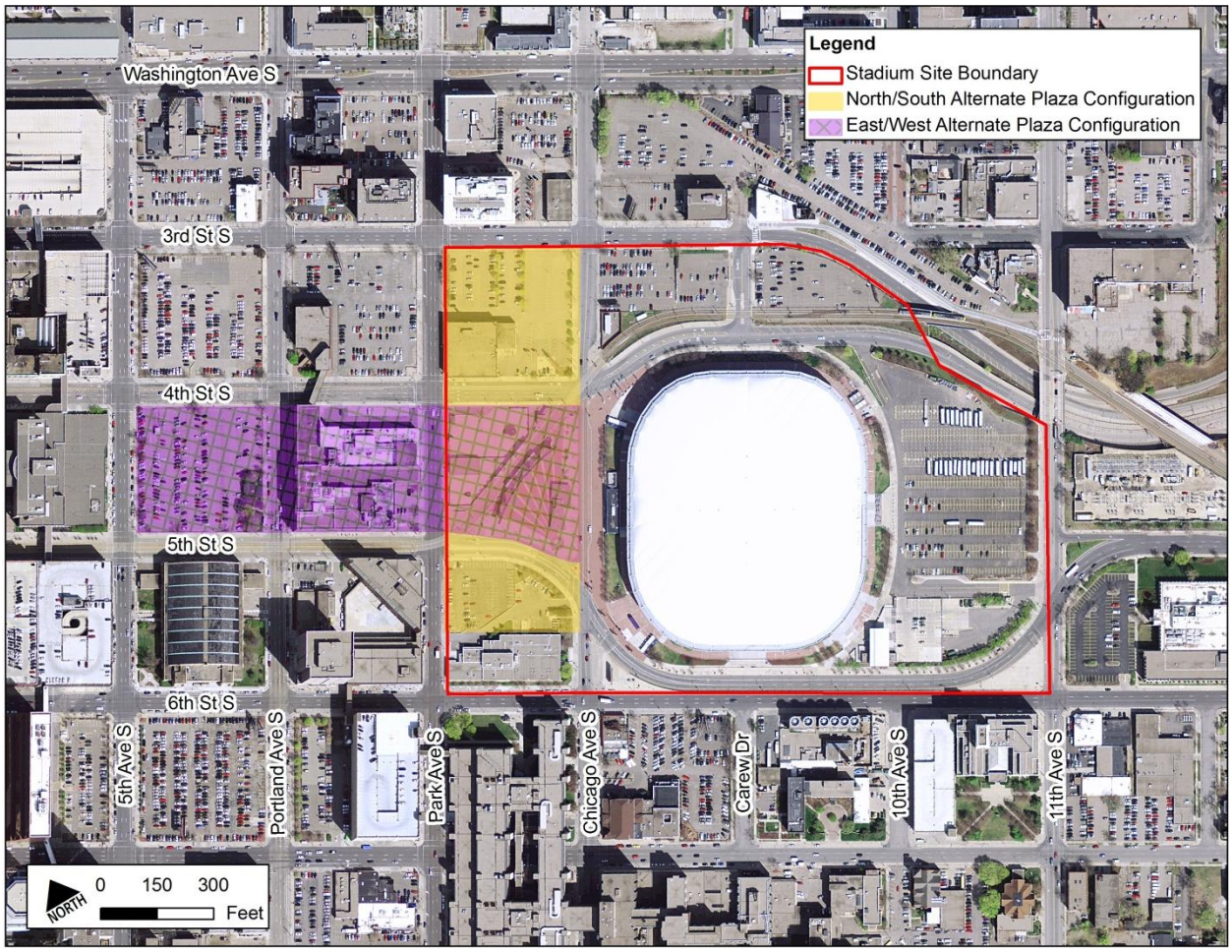
In addition to the Proposed Project elements discussed above, other notable proposed elements include:

- West Plaza alternate configurations
  - North/South Alternate Configuration – The West Plaza may be aligned north/south along Chicago Avenue between 3rd and 5th Streets, consistent with the Plan A parking option described below.
  - East/West Alternate Configuration – An alternate alignment of the West Plaza may be in an east/west orientation. This east/west plaza would be between Chicago and 5th Avenues, between 4th and 5th Streets, including the closure of Park and Portland Avenues two hours before NFL games on weekends, and would be consistent with the Plan B parking option described below.
- Reserved parking options
  - Parking Plan A
    - McGrew Block (3rd Street and Chicago Avenue): 600 spaces (proposed parking)
    - Downtown East Ramp (4th Street and Park Avenue): 455 spaces (existing parking)
    - 1st Covenant Church (6th Street and Carew Drive): 560 spaces (proposed parking)
    - 1010 Building (6th Street and 10th Avenue): 585 spaces (existing parking)

- 511 Building (6th Street and 13th Avenue): 300 spaces (existing parking)

- Parking Plan B
  - McGrew Block (3rd Street and Chicago Avenue): 500 spaces (proposed parking)
  - Downtown East Ramp (4th Street and Park Avenue): 455 spaces (existing parking)
  - McClellan Block (3rd Street and Park Avenue): 660 spaces (proposed parking)
  - 1010 Building (6th Street and 10th Avenue): 585 spaces (existing parking)
  - 511 Building (6th Street and 13th Avenue): 300 spaces (existing parking)

Figure ES-1. Proposed Project Area



- Roof design options
  - Two design options will be moved forward as a part of the Preferred Alternative. These two options include a fixed roof design and a retractable roof design (either moving north/south with a maximum 680 foot by 142 foot opening or east/west with a maximum 345 foot by 285 foot opening). The Stadium orientation on the project site is the same for both of the roof design options.

- Wall design options
  - Two operable wall features, a pivoting door option and a sliding door option, in addition to a fixed door option, are being considered at the east and west ends of the building. The pivoting door option may include up to five operable panels, and the sliding door option may include up to four operable panels. The height of the operable panels ranges from approximately 145 feet to 195 feet on the west side of the building and approximately 20 feet to 55 feet on the east side of the building.

Issues Addressed in the EIS

Prior to the initiation of the Draft EIS, a Scoping Decision Document (SDD) and a Scoping Environmental Assessment Worksheet (EAW) were prepared for the Proposed Project. The purpose of the SDD was to identify alternatives and issues to be addressed in the EIS and determine a schedule for the Proposed Project.

The alternatives evaluated in this Draft EIS include the Preferred Alternative (the Proposed Project) and No Action Alternative. The subject areas identified in the Final SDD for further analysis in the Draft EIS include:

- Soil conditions and contamination
- Water use
- Erosion and sedimentation
- Water quality
  - Surface water runoff
  - Wastewaters
- Site-generated waste
- Transportation
- Vehicle-related air emissions
- Odors, noise, and dust
- Nearby resources
  - Archaeological, historical, or architectural resources
  - Parkland, recreation areas, or trails
- Visual impacts
- Impact on infrastructure and public services
- Cumulative potential effects
- Construction related impacts

Information regarding potential environmental effects from the Proposed Project and proposed mitigation measures are discussed in Chapter 3 Affected Environment, Environmental Consequences, and Proposed Mitigation Measures.

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Glossary

Affected Environment: the social, natural, and economic character of the area potentially affected by a proposed action

Air Toxics: hazardous air pollutants that are known or suspected to cause serious health effects or adverse environmental effects

Alternatives: a set of options to achieve a desired outcome

Cumulative Effect: the impact on the environment which results from the incremental impact of a proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions

dBA: The symbol for a sound level measured on an A-weighted scale. The A-weighted scale gives more weight to those frequencies that are audible to the human ear and discounts those frequencies outside of the band of frequencies audible by the human ear.

Effects: Effects include direct and indirect effects. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable.

Environmental Impact Statement (EIS): A review process mandated in Minnesota law to assess the potential for significant environmental effects of a proposed action. The EIS provides information about the extent of the potential environmental impacts and how they may be avoided or minimized. An EIS is comprised of Draft and Final documents intended for government decision-makers who must approve the project, as well as the project proposer and the public.

US Environmental Protection Agency (EPA): The EPA leads the nation's environmental science, research, education, assessment, and regulation efforts.

Groundwater: subsurface water that fills available openings in rock or soil materials

L_{10} Noise Level: a sound level that exceeds Minnesota State Noise Standards for 10 percent of the time for a one-hour period

L_{50} Noise Level: a sound level that exceeds Minnesota State Noise Standards for 50 percent of the time for a one-hour period

Metrodome: the existing stadium located between 4th and 5th Streets and Chicago and 11th Avenues in downtown Minneapolis, Minnesota

Minnesota Environmental Review Program: The program is authorized by the Minnesota Environmental Policy Act (MEPA) and the rules promulgated pursuant to MEPA. Its purpose is to avoid and minimize damage to Minnesota's environmental resources caused by public and private actions. The program requires certain types of proposed projects to undergo special permits otherwise needed.

Minnesota Environmental Quality Board (EQB): State agency that adopts environmental review rules, monitors their effectiveness, and revises rules/regulations as appropriate. The EQB provides technical assistance to interpret and apply these rules.

Minnesota Pollution Control Agency (MPCA): A state agency whose purpose is to protect Minnesota's environment through monitoring environmental quality and enforcing environmental regulations.

Minnesota Sports Facilities Authority (MSFA): the project proposer and Responsible Governmental Unit (RGU) for the Minnesota Multi-Purpose Stadium

Mitigation: Mitigation includes a) avoiding the impacts altogether by not taking a certain action or parts of an action; b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; c) rectifying the impacts by repairing, rehabilitating, or restoring the affected environment; d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and e) compensating for the impact by replacing or providing substitute resources or environments.

National Ambient Air Quality Standards (NAAQS): As part of the Clean Air Act, amended in 1990, the EPA is required to set NAAQS for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards: primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly; and secondary standards set limits to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

National Pollutant Discharge Elimination System (NPDES): The NPDES is part of a national program for issuing, modifying, revoking, reissuing, terminating, monitoring, and enforcing water discharge permits and imposing and enforcing pretreatment requirements, in accordance with the Clean Water Act.

New Stadium: "Stadium" means the stadium suitable for professional football to be designed, constructed, and financed under this chapter (Minn. Stat. § 473J.03, subd. 8).

No Action Alternative: The option of taking no action. The No Action serves as a baseline for assessing the relative effects of the Build Alternative(s).

Noise Sensitive Areas: represents a potentially sensitive land use (residential property, park, school, hospital) where existing and/or forecast noise levels are monitored or modeled

Noise Area Classification (NAC): a classification system based on the land use activity at the location of a noise receptor and sets the noise standards application to that land use activity

Noise receptor: represents a potentially sensitive land use (residential property, park, school, hospital) where existing and/or forecast noise levels are monitored or modeled

Peak Hour: one hour period of the day when traffic volumes are at their highest level

Proposed Project: all elements of the project, including the new Stadium, stadium plazas, stadium infrastructure, demolition of the Metrodome, and temporary use of TCF Bank Stadium

Response Action Plan: A document that discusses the environmental conditions at the project site and the plan for appropriate handling of contaminated soil excavated at the project site. The RAP will be submitted to the MPCA for approval.

Responsible Governmental Unit (RGU): the governmental unit responsible for conducting the environmental review process, usually the unit with the greatest authority over the project as a whole

Runoff: the portion of the rainfall that is not absorbed by the ground, vegetation, or lost by evaporation, or that may find its way into receiving water bodies by surface flow

Scoping: the process of identifying a full range of actions, alternatives, and impacts to be considered in an EIS

Scoping Decision Document (SDD): This document identifies the alternatives dismissed from further consideration and the alternatives to be carried forward in the EIS. The SDD also helps to clarify and focus on the potentially significant environmental issues which will be analyzed in the EIS.

Stadium Implementation Committee: The Stadium legislation (473J.17, subd. 6) established a Stadium Implementation Committee and special procedure for all land use and development reviews

and approvals by the City of Minneapolis for the new Stadium and related stadium infrastructure. The purpose of the Stadium Implementation Committee is to make recommendations on the design plans and issue these recommendations to the City of Minneapolis Planning Commission, which then makes an advisory recommendation to the city council for final action. According to the legislation, the Stadium Implementation Committee has 60 days to review the design plans. Members of the committee include eight appointees by the Minneapolis City Council and 17 community member appointees.

Stadium infrastructure: "Stadium infrastructure" means plazas, parking structures, rights of way, connectors, skyways and tunnels, and other such property, facilities, and improvements, owned by the MSFA or determined by the MSFA to facilitate the use and development of the stadium (Minn. Stat. § 473J.03, subd. 10).

Stadium plaza: "Stadium plaza" means the open air portion of the stadium adjacent to the stadium (Minn. Stat. § 473J.03, subd. 11).

Stadium site: "Stadium site" means all or portions of the current site of the existing football stadium and adjacent areas, bounded generally by Park and 11th Avenues and 3rd and 6th Streets in the city of Minneapolis, the definitive boundaries of which shall be determined by the MSFA and agreed to by the NFL team (Minn. Stat. § 473J.03, subd. 12).

1. Purpose and Need

1.1 Proposed Action

1.1.1 Project Description

The Minnesota Sports Facilities Authority (MSFA), in conjunction with the Minnesota Vikings, is proposing a multi-purpose Stadium and related stadium infrastructure (collectively, the "Proposed Project") to be used as a venue for the National Football League (NFL) and a broad range of other civic, community, athletic, educational, cultural, and commercial activities in downtown Minneapolis, Minnesota. The Proposed Project will involve the construction of a new Stadium on the current Hubert H. Humphrey Metrodome (Metrodome) site and will include demolition of the existing Metrodome. The new, up to 1,730,000 square foot Stadium is proposed to seat approximately 65,500 persons (with expansion up to 73,000 seats) and to include suites, club seats, shops, restaurants, an NFL team museum, Hall of Fame, locker and training rooms, and year-round space for Minnesota Vikings administrative operations, ticket sales, and MSFA administrative offices.

The Proposed Project being analyzed in this Environmental Impact Statement (EIS) will include the following elements:

- Construction of a new Stadium facility
- Possible retractable elements, such as retractable roof or wall features
- Parking
- Potential closure of 5th Street from Chicago to 11th Avenues
- Stadium infrastructure, including parking facilities and the stadium plaza
- Demolition of the Metrodome

The construction of the new Stadium may take up to 35 months, which will require the Minnesota Vikings to play up to two football seasons at the existing TCF Bank Stadium on the University of Minnesota Campus. The EIS addresses the temporary impacts from the use of TCF Bank Stadium.

1.1.2 Project Legislation

In May 2012, the Minnesota legislature passed and the Governor signed legislation addressing the Proposed Project, now codified at Minn. Stat. Chpt. 473J (Stadium legislation). The Stadium legislation states that the new Stadium to be constructed shall be located at the existing Metrodome site in Minneapolis. This Stadium legislation also states that an EIS for the new Stadium shall not be required to consider alternative sites.

Project components defined in the legislation include:

- **Project boundaries:** The Stadium site for the Proposed Project is defined by the Stadium legislation as "all or portions of the current site of the existing football stadium and adjacent areas, bounded generally by Park and Eleventh Avenues and Third and Sixth Streets in the city of Minneapolis, the definitive boundaries of which shall be determined by the authority and agreed to by the NFL team" (Minn. Stat. § 473J.03, subd. 12). Stadium infrastructure locations may be further located within two blocks of the Stadium site identified in **Figure 1.1-1**.
- **Project definition:** The Stadium legislation includes the following description of the Proposed Project: "[t]he stadium and stadium infrastructure shall be designed and constructed incorporating the following general program and design elements: (1) unless otherwise agreed to by the authority and the NFL team, the stadium shall comprise approximately 1,500,000

square feet (sf) with approximately 65,000 seats, expandable to 72,000, shall meet or exceed NFL program requirements, and include approximately 150 suites and approximately 7,500 club seats or other such components as agreed to by the authority and the NFL team; (2) space for NFL team-related exhibitions and sales, which shall include the following: NFL team museum and Hall of Fame, retail merchandise and gift shop retail venues, and themed concessions and restaurants; (3) year-round space for the NFL team administrative operations, sales, and marketing, including a ticket office, team meeting space, locker, and training rooms; (4) space for administrative offices of the authority; (5) 2,000 parking spaces within one block of the stadium, connected by skyway or tunnel to the stadium, and 500 parking spaces within two blocks of the stadium, with a dedicated walkway on game days; (6) elements sufficient to provide community and civic uses as determined by the authority; and (7) a roof that is fixed or retractable, provided that if the roof is retractable, it is accomplished without any increase to the funding provided by the state or the city" (Minn. Stat. § 473J.11, subd. 3).

- **Infrastructure definition:** The Stadium legislation also defines the attendant stadium infrastructure as follows: "Stadium infrastructure means plazas, parking structures, rights of way, connectors, skyways and tunnels, and other such property, facilities and improvements, owned by the authority or determined by the authority to facilitate the use and development of the stadium" (Minn. Stat. § 473J.03, subd. 10).

The Stadium legislation is provided in **Appendix A** of this EIS.

1.1.3 Identification of Phased or Connected Actions

Future development plans or projects by others within or adjacent to the Proposed Project site boundaries are not part of the Proposed Project and are not covered by this EIS. Such future projects are not phased or connected actions by the MSFA and will be reviewed independently of the Proposed Project by the City of Minneapolis or other appropriate responsible governmental units, if proposed. The EIS considers the cumulative potential effects of the Proposed Project, in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources as the Proposed Project, including future projects actually planned or for which a basis of expectation has been laid.

1.2 Purpose of the EIS

The Stadium legislation states that the new Stadium shall be located at the existing Metrodome site in Minneapolis. It also states that the MSFA is the Responsible Governmental Unit (RGU) for an EIS for the new Stadium prepared under Minn. Stat. § 116D.04, if an EIS is necessary, and that the EIS shall not be required to consider alternative stadium sites (Minn. Stat. § 473J.17, subd. 3).

Minnesota Rules Chapter 4410 (Minnesota Environmental Quality Board (MEQB) rules) implements the Minnesota Environmental Policy Act (MEPA) (Minn. Stat. Chpt. 116D) and requires a mandatory EIS for the following category of sports or entertainment facilities:

> 4410.4400, subp. 22 – Sports or Entertainment Facilities. For construction of a new outdoor sports or entertainment facility designed for or expected to accommodate a peak attendance of 20,000 or more persons or a new indoor sports or entertainment facility designed for or expected to accommodate a peak attendance of 30,000 or more persons.

As the RGU, the MSFA has prepared this EIS in accordance with the requirements of Minnesota Rules 4410.0200 to 4410.6500 and the legislation discussed above.

As required by Minnesota Rule 4410.2300, this EIS includes an analysis of the No Action Alternative. The No Action Alternative assumes continued use of the Metrodome by the Minnesota Vikings.

As set forth in the MEQB rules, the purpose of the EIS is to provide information regarding the extent of potential environmental effects from a proposed project and how to avoid or minimize such effects. The EIS does not approve or disapprove a project but is simply a source of information concerning the potential environmental effects of a proposed project.

The EIS process began with the preparation of a Scoping Environmental Assessment Worksheet (EAW) and Draft Scoping Decision Document (SDD) to identify the issues and alternatives to be examined in depth in this EIS. A Draft SDD was published and circulated with a Scoping EAW on October 1, 2012. Public comments on both documents were accepted throughout the Public Scoping Period which ended on October 31, 2012. The Public Scoping Period also included a Public Scoping Meeting held on October 23, 2012. Comments received during the Scoping Period were included, along with a response to each comment, in Appendix C of the Final SDD and were reflected in the body of the Final SDD where appropriate. The Final SDD was published on December 10, 2012.

1.3 Need for the Proposed Action

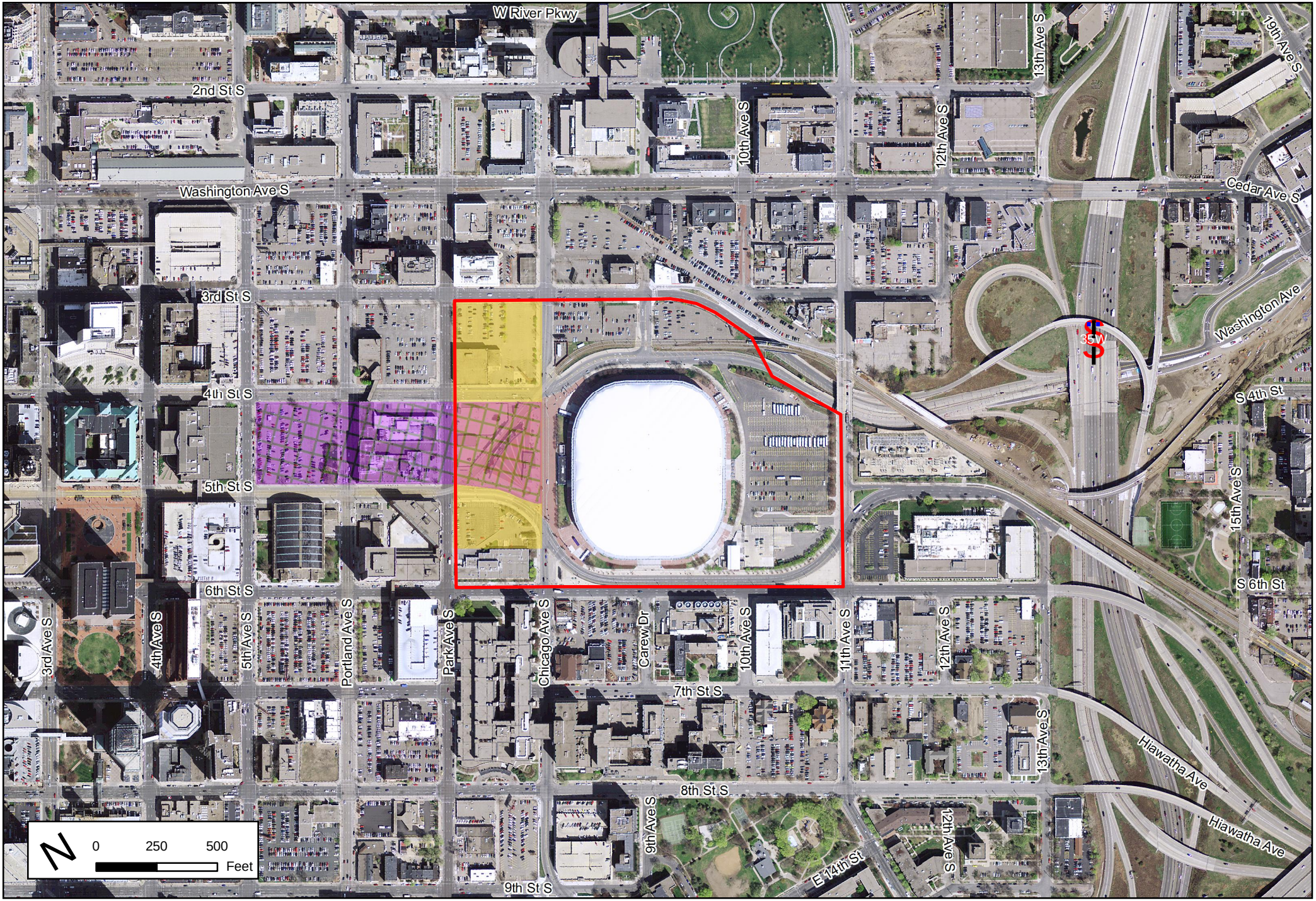
1.3.1 Project Need as Defined by State Legislation

The Minnesota legislature defined the need for the Proposed Project, determining in the Stadium legislation that the "construction, financing, and long-term use of a stadium and related stadium infrastructure as a venue for professional football and a broad range of other civic, community, athletic, educational, cultural, and commercial activities [and] the expenditure of public money for this purpose is necessary and serves a public purpose," that "property acquired by the Minnesota Sports Facilities Authority for the construction of the stadium and related stadium infrastructure is acquired for a public use or public purpose," and "government assistance to facilitate the presence of professional football provides to the state of Minnesota and its citizens highly valued intangible benefits" (Minn. Stat. § 473J.01).

1.3.2 Project Need as Defined by Existing Metrodome Conditions

The site of the Proposed Project is currently occupied by the Metrodome, surface parking, parking structures, roadways and sidewalks, an open air plaza, buildings, and a transit station (**Figure 1.1-1**). The Metrodome was constructed in 1982. At 30 years old, the Metrodome is one of the NFL's oldest non-refurbished stadiums and consistently ranks among the worst sports facilities in fan surveys.[1] Current services and features within the Metrodome are inadequate, causing fan frustration as a result of lines and overcrowded concourses.

[1] Sports Illustrated website (http://www.totalprosports.com/2010/07/26/9-of-the-worst-sports-stadiums-in-america/; accessed 3/8/2013)



MINNESOTA SPORTS FACILITIES AUTHORITY

Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT

Legend

- Stadium Site Boundary
- North/South Alternate Plaza Configuration
- East/West Alternate Plaza Configuration

Figure 1.1-1. Project Study Area

2. Project Alternatives

2.1 Range of Alternatives

The MEQB rules require an EIS to include at least one alternative of the following types or provide a concise explanation of why no alternative of a particular type is included in the EIS (Minnesota Rule 4410.2300, subp. G):

- Alternative sites
- Alternative technologies
- Modified designs or layouts
- Modified scale or magnitude
- Alternatives that incorporate reasonable mitigation measures identified through comments received during the scoping process

An alternative may be excluded from an EIS when: (1) the alternative does not meet the underlying purpose or need for the project; (2) the alternative would likely not have any significant environmental benefit compared to the proposed project; or (3) another alternative, of any type, that will be analyzed in the EIS would likely have similar environmental benefits, but substantially less adverse economic, employment, or sociological impacts (Minnesota Rule 4410.2300, subp. G).

2.1.1 Alternative Sites

No alternative sites are addressed in this EIS because alternative sites would not be consistent with the purpose and need for the Proposed Project. The Stadium legislation states that "the environmental impact statement shall not be required to consider alternative stadium sites" (Minn. Stat. § 473J.17, subd. 3). Furthermore, the legislation states that the Stadium to be constructed "shall be located at the [existing Metrodome] site in the city of Minneapolis" (Minn. Stat. § 473J.10).

2.1.2 Alternative Technologies

Technology alternatives will also not be addressed in this EIS. The Proposed Project does not involve opportunities for defining alternatives based solely on alternative technology.

2.1.3 Modified Designs or Layouts

Modified designs or layouts of the Stadium will not be addressed in the EIS. The primary orientation of the proposed Stadium will not change, and the Preferred Alternative that is evaluated reflects options relative to retractable roof or operable wall features. The roof and wall design options evaluated in this EIS reflect the largest potential roof and wall openings. Two alternate configurations for stadium infrastructure will be addressed in the EIS. See Section 2.2.2.5 for further discussion regarding the design process for the Proposed Project.

2.1.4 Modified Scale or Magnitude

No Stadium designs with modified scale or magnitude are addressed in this EIS because they would not be consistent with the purpose and need for the Proposed Project. The Stadium legislation provides specifics regarding the design and construction of the new Stadium and stadium infrastructure. The legislation states that "stadium and stadium infrastructure shall be designed and constructed incorporating the following general program and design elements: (1) unless otherwise agreed to by the authority and the NFL team, the stadium shall comprise approximately 1,500,000 square feet (sf) with approximately 65,000 seats, expandable to 72,000, shall meet or exceed NFL program requirements, and include approximately 150 suites and approximately 7,500 club seats or

other such components as agreed to by the authority and the NFL team" (Minn. Stat. § 473J.11, subd. 3).

2.1.5 Alternatives that Incorporate Reasonable Mitigation Measures

As mitigation measures are identified throughout the EIS process, including measures identified through public comments received during the scoping process and on the Draft EIS, they will be disclosed and incorporated, as appropriate in the Final EIS.

2.2 Alternatives Considered in the EIS

2.2.1 No Action Alternative

As required by Minnesota Rule 4410.2300, the EIS includes analysis of the No Action Alternative. The No Action Alternative assumes continued use of the Metrodome by the Minnesota Vikings. Other uses of the facility would also continue, such as baseball games, concerts, and other civic uses. The Metrodome is approximately 900,000 square feet with a maximum seating capacity of 63,962. The Metrodome is located between 4th and 5th Streets and Chicago and 11th Avenues in downtown Minneapolis, Minnesota.

2.2.2 Preferred Alternative

2.2.2.1 Proposed Project

The Preferred Alternative (also referred to as the "Proposed Project" or the "Build Alternative") is the construction of a multi-purpose stadium and related stadium infrastructure to be used as a venue for the NFL and a broad range of other civic, community, athletic, educational, cultural, and commercial activities in downtown Minneapolis, Minnesota. The Proposed Project will involve the construction of a new Stadium on the current Metrodome site. The Stadium legislation describes the preliminary boundary of the Proposed Project site as follows: "all or portions of the current site of the existing football stadium and adjacent areas, bounded generally by Park and Eleventh Avenues and Third and Sixth Streets in the city of Minneapolis, the definitive boundaries of which shall be determined by the authority and agreed to by the NFL team" (Minn. Stat. § 473J.03, subd. 12) (refer to **Figure 1.1-1** in Chapter 1 Purpose and Need.) An alternate alignment of the plaza on the west side of the Stadium may be in an east/west orientation. This East/West Alternate Plaza Configuration would be between Chicago and 5th Avenues, between 4th and 5th Streets.

Stadium

The total size of the new Stadium is proposed to be up to approximately 1,730,000 square feet. The Stadium is proposed to have approximately 65,500 seats, with expansion of up to approximately 73,000 seats to meet NFL requirements for hosting a Super Bowl event. Other uses of the Stadium, such as National Collegiate Athletic Association (NCAA) basketball, Major League Soccer, and concerts, are assumed to not exceed 73,000 seats. This EIS analyzes a new Stadium with a maximum seating capacity of 73,000. The Stadium is proposed to include approximately 150 suites and 7,500 club seats; space for NFL team related exhibitions and sales, including an NFL team museum, Hall of Fame, retail merchandise and gift shop venues, concessions, and restaurants; year-round space for the NFL team administrative operations, sales, and marketing, including a ticket office, team meeting spaces, and locker and training rooms; and space for administrative offices of the MSFA.

The building height at each side of the Stadium is approximately as follows:

- South building elevation: 190 feet
- North building elevation: 205 feet

- East building elevation: 205 feet
- West building elevation: 290 feet

A variety of materials are being evaluated for use on the Stadium including on portions of the fixed roof, a potential retractable roof feature, and operable wall features. Materials under consideration include stone, wood, metal, glass, PVC (polyvinyl chloride), and ETFE (ethylene tetrafluoroethylene).

Roof Design

Two design options will be moved forward as a part of the Preferred Alternative. These two options include a fixed roof design and a retractable roof design (either moving north/south with a maximum 680 foot by 142 foot opening or east/west with a maximum 345 foot by 285 foot opening). The Stadium orientation on the project site is the same for both of the roof design options. The EIS addresses the worst case (largest opening) for the two roof design options related to event noise, event lighting, and surface water runoff. The two roof design options are not anticipated to differ with regard to any other environmental impacts addressed in the EIS.

Stadium Access and Entrances

The new Stadium is proposed to have four main access points for general admission into the Stadium: on the north, south, east, and west sides of the building. Approximately 75 percent of all Stadium visitors are anticipated to walk through the West Plaza towards the new Stadium. Two operable wall features, a pivoting door option and a sliding door option, in addition to a fixed door option, are being considered at the east and west ends of the building. The pivoting door option may include up to five operable panels, and the sliding door option may include up to four operable panels. The height of the operable panels ranges from approximately 145 feet to 195 feet on the west side of the building and approximately 20 feet to 55 feet on the east side of the building.

The Proposed Project is to be designed to comply with Americans with Disabilities Act (ADA) requirements. The east entrance is accessed by a large staircase and ramp configuration for an accessible route.

2.2.2.2 Related Stadium Infrastructure

As defined by the Stadium legislation (Minn. Stat. § 473J.03, subd. 10), the Proposed Project is also proposed to include stadium infrastructure such as plazas, parking structures, rights of way, connectors, skyways and tunnels, and other such property, facilities, and improvements.

Stadium Plazas

- West Plaza

The main entry to the Stadium is the West Plaza on the west side of the building. Two alternate configurations will be moved forward for this plaza.

- North/South Alternate Configuration – The West Plaza may be aligned north/south along Chicago Avenue between 3rd and 5th Streets, consistent with the Plan A parking option described below.
- East/West Alternate Configuration – An alternate alignment of the West Plaza may be in an east/west orientation. This east/west plaza would be between Chicago and 5th Avenues, between 4th and 5th Streets, including the closure of Park and Portland Avenues two hours before NFL games on weekends, and would be consistent with the Plan B parking option described below.

The West Plaza and public realm will have a variety of uses both on game days and non-game days. On game days, the plaza programming is proposed to include concessions, activities for children,

merchandise, and tickets. On non-game days these public spaces will be used consistent with other public park spaces in Minneapolis.

- East Plaza

The East Plaza is an extension of the Deck Concourse. This exterior space could include a gated lounge space to provide a "club like" experience.

Parking

This EIS assesses the impacts of two reserved parking plans that are currently under consideration and described below. Both parking plans consist of 2,500 total parking spaces and are depicted in **Figure 3.7-9** in Chapter 3 Affected Environment, Environmental Consequences, and Proposed Mitigation Measures.

- Parking Plan A (consistent with the North/South Alternate Plaza Configuration for the West Plaza)
  - McGrew Block (3rd Street and Chicago Avenue): 600 spaces (proposed parking)
  - Downtown East Ramp (4th Street and Park Avenue): 455 spaces (existing parking)
  - 1st Covenant Church (6th Street and Carew Drive): 560 spaces (proposed parking)
  - 1010 Building (6th Street and 10th Avenue): 585 spaces (existing parking)
  - 511 Building (6th Street and 13th Avenue): 300 spaces (existing parking)
- Parking Plan B (consistent with the East/West Alternate Plaza Configuration for the West Plaza)
  - McGrew Block (3rd Street and Chicago Avenue): 500 spaces (proposed parking)
  - Downtown East Ramp (4th Street and Park Avenue): 455 spaces (existing parking)
  - McClellan Block (3rd Street and Park Avenue): 660 spaces (proposed parking)
  - 1010 Building (6th Street and 10th Avenue): 585 spaces (existing parking)
  - 511 Building (6th Street and 13th Avenue): 300 spaces (existing parking)

The Proposed Project is also proposed to include up to 200 team parking spaces.

Bicycle parking is proposed to be located on the northeast and southwest sides of the new Stadium along a proposed bike/pedestrian path that circles the Stadium.

Vehicle Access

The Proposed Project includes:

- Two new driveways on 6th Street (one entrance and one exit) for drop-off and to access the team parking lot, which is also accessed from 11th Avenue
- Two new driveways on 4th Street (one entrance and one exit) for drop-off and parking
- Driveway on 4th Street to access the loading dock
- Driveway (entrance only) on 11th Avenue for service vehicles; exiting service vehicles share the driveway with the team parking lot entrance/exit

Skyways and Tunnels

Figure 3.7-16 (see Chapter 3 Affected Environment, Environmental Consequences, and Proposed Mitigation Measures) identifies skyways and tunnels that are included in the Proposed Project. The parking facilities on the McGrew Block (proposed), the McClellan Block (proposed), 1st Covenant Church (proposed), and the 1010 Building (existing) are proposed to be connected to the new

Stadium via walkways. The Downtown East Ramp (existing) is proposed to be connected to the new Stadium via a tunnel.

Potential Street Closures and Modifications

The permanent closure of 5th Street between Chicago and 11th Avenues and incorporation into the project site is proposed as part of the Proposed Project.

This EIS assesses the impacts of two permanent street closure options. These options are described below and depicted in **Figures 3.7-3 and 3.7-4** in Chapter 3 Affected Environment, Environmental Consequences, and Proposed Mitigation Measures:

- Permanent Street Closure Option 1: 5th Street closure from Chicago Avenue to 11th Avenue with reroute of traffic onto 7th Street or Washington Avenue
- Permanent Street Closure Option 2: 6th Street contraflow lane from Chicago Avenue to 11th Avenue with all existing through traffic on 5th Street using a contraflow lane[1] (except the westbound left-turn movement from 5th Street to Chicago Avenue would be diverted to 7th Street)

2.2.2.3 Demolition of the Metrodome

The Proposed Project will require the demolition of the Metrodome which is anticipated to occur during the first quarter of 2014. The Proposed Project also includes the demolition of seven other structures on the Metrodome property, and, as noted above, the potential vacation of existing 5th Street from approximately Chicago to 11th Avenues. See Section 3.15 for discussion of demolition and construction.

2.2.2.4 Temporary Use of TCF Bank Stadium

The construction of the new Stadium could take up to 35 months, requiring the Minnesota Vikings to play up to two NFL football seasons at the existing TCF Bank Stadium on the University of Minnesota campus. The EIS addresses the temporary impacts from the use of TCF Bank Stadium.

2.2.2.5 Design Review

The analysis presented in this Draft EIS reflects the draft design plans available for the Proposed Project at the time of publication. These draft design plans include preliminary site plans, floor plans, structural cross sections, elevations, and streetscaping. Design work is continuing as this Draft EIS is published, and final designs are anticipated to be available by May 2013.

The Final EIS will provide updated information and analysis regarding design refinements for the Proposed Project. The MSFA does not expect that the final design refinements will result in any material modification of the environmental effects analyses for the draft design plans evaluated in the Draft EIS. However, if the final design refinements require modification of the environmental effects analyses in the Draft EIS, the Final EIS will identify and discuss such modifications.

2.3 Project Description Summary

Table 2.3-1 summarizes key elements of the Preferred Alternative.

[1] A contraflow lane is a lane in which traffic flows in the opposite direction of the surrounding lanes.

Table 2.3-1. Preferred Alternative Summary

Project Component	Details		
Site boundary	11th Avenue to Park Avenue and 3rd Street to 6th Street		
Square footage of Stadium	Up to approximately 1,730,000 square feet		
Access points	■ 75% of all Stadium visitors are anticipated to walk through the West Plaza towards the new Stadium ■ Entries on the west, north, south, and east sides		
Number of seats	Approximately 65,500 (73,000 with Super Bowl seating)		
Location of proposed reserved parking	Plan A (2,500 total spaces) ■ McGrew Block: 600 spaces ■ Downtown East Ramp: 455 spaces ■ 1st Covenant Church: 560 spaces ■ 1010 Building: 585 spaces ■ 511 Building (Timeshare): 300 spaces	Plan B (2,500 total spaces) ■ McGrew Block: 500 spaces ■ Downtown East Ramp: 455 spaces ■ McClellan Block: 660 spaces ■ 1010 Building: 585 spaces ■ 511 Building (Timeshare): 300 spaces	
	Up to approximately 200 spaces for team parking		
Roof design	Fixed option ■ Transparency could range from fully transparent to opaque	Retractable options ■ Moving North/South ■ Maximum 680 foot x 142 foot opening ■ Moving East/West ■ Maximum 345 foot x 285 foot opening	
West doors	Fixed wall option	Pivoting option (approximate dimensions) ■ Five 65 foot operable panels ■ Opening 320 feet wide	Sliding option (approximate dimensions) ■ Four 65 foot operable panels ■ Opening 255 feet wide
East doors	Fixed wall option	Pivoting option (approximate dimensions) ■ Five 40 foot operable panels ■ Opening 195 feet wide	Sliding option (approximate dimensions) ■ Four 40 foot operable panels ■ Opening 155 feet wide
Potential height of facility	■ South building elevation: approximately 190 feet ■ North building elevation: approximately 205 feet ■ East building elevation: approximately 205 feet ■ West building elevation: approximately 290 feet		

Project Component	Details	

Stadium plazas	West Plaza
	■ North/South Alternate Configuration
	  ■ Along Chicago Avenue between 3rd Street & 5th Street
	■ East/West Alternate Configuration
	  ■ Between Chicago Avenue and 5th Avenue and 4th Street and 5th Street
	  ■ Includes the closure of Park and Portland Avenues two hours before games on weekends
	■ On game days will include concessions, activities for children, merchandise, and ticket sales
	■ Use will be consistent with other public park spaces in Minneapolis
		East Plaza
		■ Extension of the Deck Concourse
		■ Exterior space can include a gated lounge space for a "club-like" experience

Street closures	Option 1: 5th Street Closure (from Chicago Avenue to 11th Avenue) ■ Reroute traffic onto 7th Street or Washington Avenue	Option 2: 6th Street Contraflow Lane (from Chicago Avenue to 11th Avenue) ■ All existing 5th Street through traffic would use contraflow lane, except the westbound left-turn movement from 5th Street to Chicago Avenue would be diverted to 7th Street
Skin material	A variety of materials are being evaluated for use on portions of the fixed roof, retractable roof, and operable façade, stone, wood, metal, glass, PVC (polyvinyl chloride), and ETFE (ethylene tetrafluoroethylene).	
General use of facility	Football games, baseball games, Major League Soccer, concerts, other civic and community uses	

3. Affected Environment, Environmental Consequences, and Proposed Mitigation Measures

3.1 Soil Conditions and Contamination

The EIS includes analysis of potential environmental hazards from past land use conditions and from demolition and construction associated with the Proposed Project.

3.1.1 Soil Conditions

Soils in the Proposed Project area average about 40 feet thick, overlying limestone bedrock of the Platteville Formation (*Geologic Atlas of Hennepin County*, Minnesota Geological Survey, 1989). The Proposed Project area contains a single soil type, identified as U4A - Urban Land Udipsamments (cut and fill land) Complex, with 0 to 2 percent slopes.[1] The city of Minneapolis was historically excluded from the Soil Survey due to urban development and extensive soil reworking.

According to the Geologic Atlas of Hennepin County, the surficial soils in the Proposed Project area are Middle Terrace glacial-meltwater stream sediments of sand, gravelly sand, and loamy sand, which are overlain in places by thin deposits of silt, loam, or organic sediment. The surficial deposits are frequently covered by thick fill or reworked local materials where heavily developed.

3.1.2 Potential Environmental Hazards from Past Uses

3.1.2.1 Background

Purpose

A governmental database records search has been completed for the Proposed Project area, which supplements Phase I Environmental Site Assessments (ESAs) completed for specific properties within the Proposed Project area. The studies and searches have been used to determine the potential extent of the environmental hazards from past site uses that could be encountered by the Proposed Project. The EIS summarizes the findings of the studies, searches, and surveys as the information relates to potential contamination found within the Proposed Project area.

Scope of Environmental Review

Information on soil and contamination conditions has been gathered from the following property-specific documentation available at this time:

- Phase I Environmental Site Assessments (ESAs)
- Phase II ESAs or comparable investigations
- *The EDR Radius Map Report with Geocheck* [governmental database records search], Environmental Data Resources, Inc. (EDR); March 11, 2013
- *What's in my Neighborhood?* [an on-line governmental database], Minnesota Pollution Control Agency (MPCA); accessed March 8, 2013

[1] Natural Resources Conservation Service Web Soil Survey, http://websoilsurvey.nrcs.usda.gov/app/; accessed August 27, 2012

Property-Specific Environmental Reviews within the Proposed Project area have been performed by American Engineering Testing, Inc. (AET) for the MSFA. Those Reviews and a summary Technical Memorandum are included in **Appendix B** of the EIS. The EDR report of governmental database records search is also included in **Appendix B**.

3.1.2.2 Affected Environment

Identified Environmental Hazards

Environmental review has identified contaminant impacts to soil, groundwater, and soil gas media on various properties. Contaminants include metals, petroleum, volatile organic compounds (VOCs), and other organic compounds such as polynuclear aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs).

These findings are consistent with historical operations within the Proposed Project area, including the following: railroad; foundry and ironworks; machining, welding, and sheet metal; blacksmith/tinsmith; electroplating; engraving; plumbing and heating; furniture factory; carpentry and wagonwright; laundry; paint, print, and binding; paper and box factory; bottling and liquor storage; morgue and hospital; warehouse; lumber yard; parking; and auto repair and gas station.

Affected Properties

Environmental review indicates that the identified contaminant impacts result in an affected environment at the following properties within the Proposed Project area (see **Figure 3.1-1**):

- Block 71 – 300 9th Avenue South: VOCs, PAHs, and metals including barium, copper, and arsenic
- Block 73 – 424 Chicago Avenue South and 701 4th Street South (contaminant impacts in Light Rail Transit right-of-way adjacent to Block 73): petroleum
- Block 94 – 530 Chicago Avenue South: petroleum and PAHs
- Block 106 – 309 9th Avenue South: VOCs, PAHs, and metals including lead, copper, and arsenic
- Metrodome – 900 5th Street South: organic vapors (i.e., VOCs) and PCBs

Degree of Certainty

MPCA regulatory files for the identified properties have been requested for review, but the files have not yet become available for review. Given the information accessed, the degree and distribution of contaminated soil conditions is not yet well defined throughout the Proposed Project area. While potential soil contamination is not considered to be everywhere within the Proposed Project area, it would be difficult to rule out soil contamination at any given location without further assessment.

3.1.2.3 Environmental Consequences

Direct Consequences

The environmental consequences of contamination in soil, groundwater, and soil gas media begin with potential risks to site workers, site users, or off-site receptors. The types, magnitudes, extents, and other characteristics of contamination would require additional assessment to better define the potential risks to human health and the environment. Once more fully defined, the risks would require proper planning and mitigation during the site redevelopment process.

Indirect Consequences

The coarse-grained natural soil deposits are considered susceptible to groundwater contamination and vapor migration if releases occur. However, the prevalence of paved surfaces and thick fill in

places serves to insulate the underlying natural soils and groundwater from contaminant migration. The Proposed Project design and construction process is expected to include additional assessment and removal of contaminant impacts in shallow soils. The Proposed Project is not expected to alter the general soil conditions or permanently enhance the potential for contaminant migration. However, dewatering during construction has a potential to affect groundwater hydraulic conditions and the distribution of any associated contamination.

3.1.2.4 Mitigation

Regulatory Considerations

In most cases, mitigation measures for environmental contamination in the State of Minnesota are undertaken in coordination with the MPCA. The MPCA offers the following fee-for-service voluntary programs which can provide liability assurances to owners, prospective purchasers, or developers:

- Petroleum Brownfield Program (PBP) for petroleum contamination
- Voluntary Investigation and Cleanup (VIC) program for non-petroleum impacts

The MPCA voluntary programs operate in coordination with state regulatory programs such as Superfund and Petroleum Remediation Program (PRP) to offer liability assurances consistent with both voluntary programs and regulatory statutes, rules, and policies. The voluntary programs also offer users prescribed guidelines and standardized approaches for investigation, response action planning, remediation, and monitoring of mitigation measures.

Materials Management

During site preparation for the Proposed Project, the MSFA may encounter the presence of contamination or solid waste that must be properly managed to minimize risks. The following materials management categories, each requiring unique permitting and documentation measures, are anticipated for materials expected to be encountered within the Proposed Project area:

- Landfill disposal/management of hazardous or solid waste
- Landfill disposal or potential reuse of regulated fill soil following state and local government notification procedures
- Potential on-site or off-site reuse or approved disposal of unregulated fill soil depending on soil characteristics and conditions at the prospective receiving site
- Potential on-site or off-site reuse or disposal of uncontaminated soil depending on soil suitability for planned construction uses
- Soil and bedrock, either contaminated or uncontaminated, which may remain *in situ*
- Discharge or sanitary disposal of potentially contaminated waters which may require advanced planning, permitting, pre-treatment, or other management measures

Risk Management

The presence of soil gas contamination in the ground may result in migration and encroachment risks to buildings, whether existing or yet to be constructed.

- Given the information developed in this EIS, further investigation of potential vapor intrusion risks appears warranted.
- If investigation activities indicate a potential for vapor intrusion to buildings at concentrations exceeding action levels, then vapor mitigation measures would be necessary such as active or passive vent and barrier systems.

The presence of the identified environmental impacts to soil, groundwater, and soil gas media would require enhanced diligence during planning and construction to manage risks associated with contaminated media, to coordinate waste stream management, to confirm the presence and degree of risks, and to mitigate any residual risks which are not remediated.

3.1.2.5 No Action Alternative

If the No Action Alternative is selected, any contaminated media and potential soil contamination would remain undisturbed. The mitigation measures to engage regulatory authorities and to manage the waste stream would not be necessary.

Given the limited scope of previous environmental assessments in the area of the existing Metrodome, the degree of inherent risk from *in situ* contamination is not certain. The potential would remain for contaminant migration to affect human health and the environment at affected properties and potentially off-site.

3.2 Water Use

3.2.1 Public Water Supply

3.2.1.1 Affected Environment

The City of Minneapolis owns and operates a public water system that provides service to the Proposed Project site. The City watermain network in the vicinity of the Proposed Project site consists of an existing 12 inch public watermain located in 6th Street, an existing 16 inch public watermain in 11th Avenue, and an existing 12 inch public watermain in Chicago Avenue. The 16 inch watermain in 11th Avenue is inside a 30 inch casing pipe under 4th Street. See **Figure 3.2-1** for existing utility information.

The peak monthly water demand for the Metrodome is three million gallons, based on the Metropolitan Sports Facilities Commission (MSFC) July 26, 2011 utility invoice. Annual water demand for the Metrodome is 18 million gallons, based on MSFC utility invoices from June 2011 through May 2012.

3.2.1.2 Environmental Consequences

The existing water services that serve the Metrodome are proposed to be replaced by a new 12 inch domestic service, and 8 inch fire service are proposed to be tapped off the existing 12 inch public watermain in 11th Avenue. The anticipated peak water demand for new Stadium events is 3,000 gallons per minute (gpm). The City of Minneapolis has indicated that the public water system has adequate capacity to provide service to the new Stadium.

The estimated peak monthly water demand for the new Stadium is approximately one million gallons, and the estimated annual water demand is approximately 10 million gallons.

3.2.1.3 Mitigation

No adverse effects have been identified; therefore, no mitigation measures are proposed.

3.2.1.4 No Action Alternative

In the No Action Alternative the Metrodome would continue to function as it currently does. No changes to the public water system would be required to continue to allow the Metrodome to function.

3.2.2 Groundwater

3.2.2.1 Affected Environment

Based on information provided by AET in their November 21, 2008 letter to the MSFC (see **Appendix B**), the groundwater in the Metrodome area is very near the elevation of the existing playing field. The playing field elevation is approximately 795.9 feet. A groundwater interception system was constructed as part of the original Metrodome project to prevent groundwater from entering the Metrodome. During construction of the Metrodome, the contractor had difficulty lowering the groundwater table in order to construct the sump pit for the interception system due to the high and rapid inflow of water. There is history of the area near home plate being flooded, which led to additional small shallow wells drilled into the limestone to lower the water level.

The existing Metrodome groundwater interception system is pumped to the sanitary sewer system. The existing discharge rate is unknown. Given there is no known Minnesota Department of Natural Resources (DNR) groundwater appropriation permit, it is assumed the discharge rate is below 10,000 gallons-per-day and under 1 million-gallons-per-year.

3.2.2.2 Environmental Consequences

The playing field elevation for the Proposed Project is 797.5 feet, which is approximately 2 feet above the current Metrodome playing field elevation. Raising the playing field elevation should reduce groundwater pumping frequency, but permanent dewatering remains part of the Stadium design. The groundwater discharge will be to the storm sewer system.

Dewatering is anticipated during construction. The contractor shall follow all stipulations found in the MPCA Construction Stormwater permit and DNR dewatering permit (if required).

3.2.2.3 Mitigation

Groundwater pumped into the storm sewer system should enter the storm sewer system downstream of any proposed infiltration systems to preserve infiltration capacity for rainfall events and to avoid creating a continuous loop between groundwater pumping and infiltration.

The use of wells and/or cut-off walls is anticipated to control groundwater during construction. Discharge of all dewatering efforts will pass through approved on-site best management practices (BMPs) prior to discharge. Construction dewatering should include water quality monitoring to determine suitability of discharge to storm sewer or sanitary sewer system.

If groundwater is found to be contaminated, either during construction dewatering or during permanent groundwater pumping, discharge to the sanitary sewer system would likely be required. In the permanent groundwater pumping scenario it may be necessary to design plumbing to allow discharge to the storm sewer system or to the sanitary sewer system, with a manually operated valve controlling which receives the discharge depending on the ground water quality. Periodic groundwater water quality monitoring would be necessary.

3.2.2.4 No Action Alternative

In the No Action Alternative the Metrodome would continue to function as it currently does. No changes to the groundwater system would be required to continue to allow the Metrodome to function.

3.3 Erosion and Sedimentation

3.3.1 Affected Environment

Soils information is taken from existing geotechnical information, including *Report of Preliminary Geotechnical Exploration and Review*: Report No. 01-05-723 prepared by American Engineering Testing, Inc. dated February 25, 2013 (see **Appendix B**).

This report identifies existing fill across the Stadium site that ranges in depths from 5 to 20 feet. Underlying the fill is terrace-deposited sands that consist of poorly graded sand to silty sand that ranges in depth from 15 to 30 feet across the Stadium site. Underlying the terrace deposits are glacial deposits that range from a silty sand to a clayey sand and may contain cobbles and boulders which extends to bedrock depth. These soils are conducive to infiltration with the clayey sands as the limiting layer.

Areas with steep slopes are identified as having slopes greater than 1 vertical (v):3 horizontal (h) (12 percent or greater). The only area with steep slopes and any ground vegetation present within the Proposed Project area is in the northeast quadrant of the existing Metrodome (between the east parking lot and 4th Avenue). The remainder of the site is predominantly covered with structures (buildings), parking lots, plazas and walkways, as well as the surrounding streets and sidewalks. With minor exceptions, the existing site consists of impervious material.

A preliminary earthwork analysis was performed to determine an approximate excavation and export volume for the project. The analysis was conducted by first modeling the Metrodome "bowl" area (i.e., the excavated space below the main concourse) and quantifying the volume of the bowl. The same analysis was performed on the new Stadium's bowl area using the existing main concourse elevation as the basis of the calculation (this elevation represents the approximate existing ground grade around the new Stadium). The two volumes were then compared in order to determine an approximate net material export volume. The results are summarized below:

- Metrodome bowl volume: 340,000 cubic yards
- New Stadium bowl volume: 810,000 cubic yards
- Proposed excavation quantity (considering existing Metrodome bowl): 525,000 cubic yards
- Net export volume: 470,000 cubic yards

3.3.2 Environmental Consequences

The potential for erosion and sedimentation during Proposed Project construction will exist as soils are disturbed by excavation and grading. Particular attention should be paid to areas with steep slopes as they can present unstable soil conditions that can result in erosion if not properly managed during construction activities.

3.3.3 Mitigation

Erosion and sediment control measures planned for use during and after construction of the Proposed Project will meet or exceed the requirements of the National Pollution Discharge Elimination System (NPDES) Construction Storm Water Permit.[2]

[2] Note that the MPCA is currently in the process of modifying NPDES permit rules regarding stormwater. Rule changes are expected to take effect on August 1, 2013. The new rules are anticipated to have more stringent permanent stormwater management requirements as well as more stringent construction erosion and sediment control requirements.

Although the Proposed Project is within the Mississippi Watershed Management Organization (MWMO) boundary, MWMO's erosion and sediment control requirements are generally less stringent than those of the City of Minneapolis, and the MWMO tends to defer to the City of Minneapolis on erosion and sediment control measures. A Stormwater Pollution Prevention Plan (SWPPP) will be prepared for the Proposed Project and will serve as the basis for construction management of potential erosion and for managing sediment related to the construction activity. BMPs will be developed and employed to manage erosion and sedimentation during site construction. These BMPs may include silt fencing, inlet sediment filters, sediment traps, grit chambers, temporary ditch checks, rock filter dikes, fiber logs, turf reinforcement mats, temporary seeding, riprap and erosion control blankets for disturbed areas, and seeding or placement of sod or other plant materials for final restoration.

The first phase of construction will include excavation and installation of earth retention systems in the northeast corner of the Proposed Project's new Stadium site, outside of the footprint of the existing Metrodome. The earth retention system will likely include driven steel piles. This will be a phased construction project, and therefore erosion and sediment control BMPs shall be modified and/or relocated by the contractor as work progresses.

3.3.4 No Action Alternative

With the No Action Alternative, there would be no change to soil erosion or sedimentation conditions. Furthermore, opportunities to potentially improve erosion and sedimentation through BMPs would not be realized.

3.4 Water Quality: Surface Water Runoff

3.4.1 Stormwater Runoff

3.4.1.1 Affected Environment

The Proposed Project will be constructed in Minneapolis and within the area regulated by the Mississippi Watershed Management Organization (MWMO). The Proposed Project area consists of 47.4 acres of highly urbanized land uses. These include the existing Metrodome, plazas, streets, parking facilities, a light-rail transit station (LRT), and businesses. Over 91 percent of the Proposed Project area has impervious cover, such as pavement or rooftops. See **Figure 3.4-1** for a graphical representation of the drainage areas and flow patterns discussed below.

At 24.2 acres, the block that will contain the Proposed Project's new Stadium represents the largest portion of the Proposed Project area (from 4th Street to 5th Street and 11th Avenue to Kirby Puckett Place, referred to in this section as the New Stadium Block). This area is owned by the MFSA and includes the Metrodome, parking lot, plazas, and the portion of 5th Street that will be vacated with the proposed construction. There are approximately 2.6 acres of vegetated landscaping within this area, resulting in 89.4 percent impervious coverage.

The Downtown East Block to the west of the New Stadium Block contains the transit station and associated plaza. Of this 3-acre parcel, 0.2 acre contains the LRT tracks and platforms, which are assumed to have addressed their stormwater management requirements at the time of their design, and this area is therefore not considered in the discussion below. The remainder of the parcel is considered to have 100 percent impervious coverage.

The remaining 23.2-acre portion of the Proposed Project area consists of streets, surface parking lots, and businesses. These can be further split as follows:

- The three blocks immediately to the north and east of the New Stadium Block, which are referred to as the McClellan and McGrew Blocks, comprise a total of 5.6 acres of surface parking, a

business, and LRT uses. The blocks have 95.4 percent impervious cover under the No Action Alternative.

- The block immediately to the west of the New Stadium Block by 6th Street, which is currently occupied by the Hennepin County Medical Examiner's building and a surface parking lot, is 2.7 acres. Of this, 86.3 percent consists of impervious cover.
- Immediately west of the Downtown East Block, the two blocks that are currently occupied by the Star Tribune office building and a surface parking lot comprise a total of 5.8 acres. The blocks have 89.8 percent impervious cover in the existing condition. For this EIS, these will be referred to as the East/West Alternate Plaza Configuration.
- The block in the southeast quadrant of 6th Street and Chicago Avenue currently contains the First Covenant Church and a surface parking lot. A portion of this block, 1.2 acres, is proposed to be redeveloped with the Proposed Project. This block is considered to have 100 percent impervious cover.
- The remaining area, 5.0 acres, consists of the existing city streets and light-rail transitway, the runoff from which is controlled by the City of Minneapolis and the Metropolitan Council, respectively. As with the transitway within the Downtown East Block, the impacts to runoff and water quality and mitigation of those impacts are not included in the discussion below.

There currently is little to no mitigation of stormwater runoff volume for the No Action Alternative.

Regulatory Environment

The regulatory environment has changed significantly since the existing Metrodome was constructed beginning in 1979. Except for the transit station, the parcels within the Proposed Project area were developed prior to the implementation of regulations to manage stormwater runoff for quantity or quality. When construction began on the transit station in the early 2000s, stormwater regulations were in effect, but these were likely less stringent than the current requirements for the City of Minneapolis. The following agencies have regulatory standards and requirements that govern the management of stormwater runoff for the Proposed Project:

- The City of Minneapolis
- The MWMO, which currently does not have a permit program
- The MPCA, under the Clean Water Act NPDES permit

In addition, the Minnesota Department of Transportation (MnDOT) may have interest, and may require a permit, if the Proposed Project discharges additional runoff to their storm drain system to the north of the New Stadium Block. See discussion under Section 3.4.2 for more information regarding specific stormwater requirements.

Downstream Systems and Receiving Waters

Runoff from the Proposed Project area currently drains into several municipal and MnDOT trunk storm drain and tunnel systems which ultimately discharge into the Mississippi River. The River is not currently considered to be impaired for any construction-related parameters that would require higher levels of treatment. The discussion within this section is divided into the various blocks within the Proposed Project area.

- **New Stadium Block** – The Metrodome building and adjacent parking lot drain by a private 48 inch storm drain to a deep municipal storm tunnel under 11th Avenue. A small percentage of the New Stadium Block drains by surface flow onto the surrounding streets. Runoff reaching 5th/6th Street and 11th Avenue ultimately drains by municipal storm drainage pipes into the 11th Avenue tunnel mentioned above. Runoff reaching Chicago Avenue/Kirby Puckett Place drains by municipal storm drainage pipes to a municipal storm tunnel farther north on Chicago Avenue.

The 11th Avenue tunnel and the Chicago Avenue tunnel collecting stormwater runoff from the Metrodome ultimately discharge to the Mississippi River upstream of the I-35W Bridge. Runoff from the portion of the block that reaches 4th Street flows into a storm drain constructed by MnDOT and ultimately to a storm tunnel that is owned by MnDOT. This tunnel discharges to the River downstream of the I-35W Bridge.

- **Downtown East Block** – Runoff from this block drains to municipal storm drainage pipes on Kirby Puckett Place and on Park Avenue, both of which ultimately drain to the above-mentioned Chicago Avenue tunnel.
- **McClellan and McGrew Blocks** – The McClellan Block and a portion of the westerly McGrew Block drain to the Chicago Avenue tunnel. The easterly and remainder of the westerly McGrew Blocks drain to public storm drainage pipes in 3rd Street and ultimately to the MnDOT tunnel.
- **Hennepin County Medical Examiner Block** – Runoff from this block drains to a municipal storm drainage pipe in 6th Street and ultimately to the 11th Avenue tunnel.
- **First Covenant Church Partial Block** – The Proposed Project includes the east half of the block that contains the First Covenant Church building. Runoff from the existing surface parking lot drains to the 6th Street storm sewer system, eventually draining to the 11th Avenue tunnel.
- **East/West Alternate Plaza Configuration** – Runoff from the easterly of the two blocks and a portion of the westerly block drains to a municipal storm drainage pipe in Portland Avenue, which drops into a storm tunnel farther north on Portland Avenue. Runoff from the remainder of westerly block drains to a municipal storm drainage system in 5th Avenue that ultimately drains to a municipal storm tunnel in Washington Avenue. The Washington tunnel ultimately connects to another tunnel in Portland Avenue.

Based on information received from City of Minneapolis Engineering and Public Works staff, the downstream systems can be characterized as follows:

- The 11th Avenue tunnel, built in the 1930s, has capacity and condition issues.
- The Chicago Avenue tunnel, built in the 1880s, is in poor condition. It also has capacity issues.
- The Portland Avenue tunnel has capacity (pressurizes) and condition issues.
- The MnDOT tunnel has capacity constraints.

3.4.1.2 Environmental Consequences

The land use, amount and degree of impervious soils and surfaces, and soil types influence the quantity of stormwater runoff and peak discharge rate from a site. With greater amounts of impervious soils and surfaces, less rainfall is able to infiltrate into the soil, and consequently, a higher volume of stormwater runoff will be generated than for the same area with less impervious soils and surfaces. Similarly, higher levels of impervious soils and surfaces generally result in higher peak discharge rates.

Changes in land cover are expected as a result of the redevelopment within the Proposed Project area. In general, the draft design plans have been used to identify and evaluate the anticipated changes. Where less is known about the ultimate land use and cover types, the worst-case has been assumed for impacts to stormwater runoff. It is estimated that the Proposed Project will add 1.3 acres of impervious surface within the Proposed Project area. If less impervious surface is included in the final design, the impacts to stormwater runoff will be less than those shown in this EIS. See **Figure 3.4-2** for a representation of the proposed drainage boundaries, flow patterns, and potential BMP locations.

- **New Stadium Block** – It is anticipated that the amount of impervious surface will not increase over the No Action Alternative and may decrease by up to 20 percent. This EIS assumes no

decrease in impervious surface will result from the Proposed Project. The draft design plans indicate that stormwater runoff from the New Stadium Block will be directed off-site by storm pipes to three different systems: 6th Street, Chicago Avenue, and 11th Avenue. Under the Proposed Project more of the New Stadium Block will potentially drain to the 6th Street municipal storm drainage system and to the Chicago Avenue storm drainage system. The third discharge point would be to the 11th Avenue tunnel by the existing 48 inch pipe connection.

- **Downtown East Block** – It is anticipated that there would be no change in land cover types or to the flow patterns under the Proposed Project. The MFSA is coordinating with the City of Minneapolis to determine the stormwater management requirements for the Downtown East Block. It is currently anticipated that under the Proposed Project runoff from this block will be directed to a stormwater BMP on the New Stadium Block, which would then discharge to the three systems described above.
- **McClellan and McGrew Blocks** – These blocks will likely be converted to parking structures that are assumed to have 100 percent impervious cover. The draft design plans indicate that under the Proposed Project there could be more area that would drain to the Chicago Avenue tunnel system, with the entire westerly McGrew Block directed to that system. Consequently, under the Proposed Project there will be less runoff from these blocks discharging to the MnDOT tunnel.
- **Hennepin County Medical Examiner Block** – The southern portion of the this block, which includes the building housing the medical examiner, will remain, but the draft design plans indicates the northern portion of the block (currently surface parking) would be redeveloped, potentially as a public plaza. Because the nature of the redevelopment is yet to be determined, this analysis assumes that this portion of the block would have 100 percent impervious cover in the future condition. With this change, the overall percentage of impervious cover on the block would be 91.1 percent, up from 86.6 percent in the No Action Alternative. It is also anticipated that there would be no change in flow patterns for this block.
- **First Covenant Church Partial Block** - The east portion of the block, which is currently a surface parking lot, will continue to have 100 percent impervious cover under the Proposed Project. It is anticipated that there would be no change in in flow patterns for this block.
- **East/West Alternate Plaza Configuration** – The draft design plans indicate that these blocks may be converted to public plazas with flexible programmable spaces. Because the nature of the plazas is yet to be determined, the EIS assumes that these blocks would have 100 percent impervious cover under the Proposed Project. It is also anticipated that there would be no change in flow patterns for this block under the Proposed Project.
- **Streets and Transitway** – 5th Street will be vacated and become part of the plaza and pedestrian space surrounding the new Stadium. Stormwater management for this area will be included with the New Stadium Block. It is expected that there will be no changes to the transitway or other streets under the Proposed Project.

3.4.1.3 Mitigation

The Proposed Project will meet the rate and volume control requirements of the City of Minneapolis and MPCA. The draft design plans include BMPs that will be implemented in various locations as part of the Proposed Project (**Figure 3.4-2**). Potential BMPs being explored include underground perforated pipe galleries, hydrodynamic separators (also known as water quality treatment manholes), tree trenches with Stockholm or similar soil, permeable pavement, infiltration beds, and rainwater harvesting. Determination of the BMPs to be used will be made during final design of each block.

With the worst-case assumptions for the changes in land cover types under the Proposed Project, there would be a 1.3-acre increase in impervious surface. This would result in higher volumes of runoff from the Proposed Project over those of the No Action Alternative. The primary BMP being proposed is underground perforated pipe galleries for infiltration. This system typically reduces the volume of runoff from a site. Several of the other BMPs being explored also have the potential to reduce the volume of runoff. Therefore, under the Proposed Project, it is expected that the runoff volume will be reduced from that of the No Action Alternative.

As with the runoff volume, the peak discharges without mitigation from the overall Proposed Project's Stadium site are expected to generally increase from those of the No Action Alternative. The proposed stormwater management plans show that under the Proposed Project, a few areas will be rerouted to a different storm drain system, which would increase flow rates to those systems unless mitigated. If sized appropriately, the underground perforated pipe galleries can also provide rate attenuation through the large storage capacity of the pipes. Other BMPs that reduce volume typically also reduce peak discharge rates but to a much lesser degree than underground pipe galleries. **Table 3.4-1** provides a summary of the peak discharge rates for the No Action Alternative and the anticipated condition under the Proposed Project without mitigation. During final design for each of the blocks identified in **Table 3.4-3**, BMPs would be designed such that existing discharge rates to the various systems are maintained where practicable. Increased flow rates to specific systems will be discussed with City of Minneapolis staff during final design.

Table 3.4-1. Stormwater Runoff Summary Before/After Project

Storm Drainage System	Drainage Area (acres) Before / After	Impervious Percentage Before / After	Runoff Curve Number Before / After	Peak Discharge* (cubic feet per second)		
				2-Year Before / After	10-Year Before / After	100-Year Before / After
Drainage to 11th Avenue Storm Tunnel						
Drainage to 6th St. Storm Drain	6.3 / **7.5**	92.7% / **84.5%**	97 / **94**	21 / **26**	33 / **42**	48 / **62**
Drainage to 11th Ave. By Ex. 48" Pipe	21.1 / **18.7**	89.1% / **96.9%**	95 / **97**	72 / **65**	98 / **101**	96 / **146**
Combined Flows	27.4 / **26.2**	89.1% / **93.3%**	95 / **96**	93 / **91**	127 / **142**	145 / **208**
Drainage to Chicago Avenue Tunnel						
Drainage to Park Ave. Storm Drain	1.3 / **1.4**	100% / **100%**	98 / **98**	5 / **5**	8 / **8**	12 / **12**
Drainage to Chicago Ave. Storm Drain	6.0 / **7.9**	94.2% / **100%**	85 / **98**	22 / **30**	34 / **46**	50 / **66**
Combined Flows	7.0 / **9.4**	95.2% / **100%**	87 / **98**	28 / **36**	43 / **54**	62 / **79**
Drainage to MnDOT Tunnel System						
Drainage to 3rd/4th St. Storm Drain	3.0 / **1.6**	74.9% / **76.6%**	89 / **92**	9 / **7**	16 / **11**	23 / **17**

Storm Drainage System	Drainage Area (acres) Before / **After**	Impervious Percentage Before / **After**	Runoff Curve Number Before / **After**	Peak Discharge* (cubic feet per second)		
				2-Year Before / **After**	10-Year Before / **After**	100-Year Before / **After**
Drainage to Portland Avenue Tunnel						
Drainage to Portland Ave. Storm Drain	2.9 / **2.9**	100% / **100%**	98 / **98**	11 /**11**	17 / **17**	24 / **24**
Drainage to 5th Ave. Storm Drain	2.9 / **2.9**	80.1% / **100%**	93 / **98**	8 / **11**	14 / **17**	21 / **24**
Combined Flows	5.8 / **5.8**	90.0% / **100%**	95 / **98**	19 / **22**	30 / **34**	44 / **49**

***** Values shown as **"After"** do not include storage routing for rate attenuation. Stormwater facilities will be used to limit peak discharges from the Proposed Project.

3.4.1.4 No Action Alternative

With the No Action Alternative, there would be no change to the existing stormwater conditions and no consideration of BMPs to potentially improve stormwater runoff quantity and quality.

3.4.2 Stormwater Management

As noted in Section 3.4.1, there are a variety of governmental units with regulatory authority over the Proposed Project, notably the City of Minneapolis and MPCA. The MWMO has standards for stormwater management but relies on the City of Minneapolis to review plans and implement stormwater and erosion control ordinances that are at least as stringent as the WMO standards. Chapters 54 and 52 of the City Code provide the mechanisms for enforcement of the standards. MPCA is currently in the process of amending its NPDES permit rules to impose more stringent permanent stormwater management requirements, as well as more stringent construction erosion and sediment control requirements. The rule changes are anticipated to take effect on August 1, 2013.

The City of Minneapolis and the MPCA requirements are dependent in part on the downstream receiving system. The Proposed Project does not fall within an area that has been designated as flood prone by the City of Minneapolis, but as noted above the downstream infrastructure does have capacity limitations. The Proposed Project drains to the Mississippi River. According to the Clean Water Act section 303(d) List of Impaired Waters (also known as the Total Maximum Daily Load or TMDL List) the Mississippi River is not impaired for construction-related parameters. The current standards of the two primary regulatory authorities specific to the Proposed Project area are summarized in **Table 3.4-2**. The MWMO has recently updated their management plan and will be working with the affected cities to revise or determine new water quality and volume control standards. Therefore, the table also includes the proposed MWMO standards as they may have implications for portions of the Proposed Project that are constructed at a later time.

Table 3.4-2. Stormwater Management Criteria

Stormwater Requirement	Current Permitting Authority		Potential Future Standards
	City of Minneapolis	MPCA	MWMO
Volume Control	Not applicable	Desired but not required for projects not draining to impaired or special waters	It is anticipated that a volume control standard will be in place in 2013.
Rate Control	Do not exceed existing condition peak discharge rates for the 2-, 10-, and 100-year storms, SCS Type II/24-hour storms	Not applicable to projects not draining to impaired or special waters	Do not exceed existing condition peak discharge rates for the 2-, 10-, and 100-year storms, SCS Type II/24-hour storms
Water Quality	70% Total Suspended Solids (TSS) removal from project runoff generated by a 1.25-inch rainfall	½-inch of runoff from the added impervious surface (For filtration BMPs, the system must have a reasonable chance of achieving 80% TSS removal.)	90% TSS removal from runoff generated by the 95th percentile daily rainfall total (currently 1.17 inches in 24 hours) over the entire area of the site (not just the site areas being developed or disturbed)

3.4.2.1 Affected Environment

With the possible exception of the existing transitway, there are no stormwater BMPs to manage stormwater for water quality treatment or rate and volume attenuation in the Proposed Project area. Stormwater runoff currently discharges to the municipal and MnDOT storm drain systems and then to the Mississippi River untreated.

3.4.2.2 Environmental Consequences

Based upon the draft design plans and the stormwater report for the Proposed Project, there will be an increase in impervious surface of approximately 1.3 acres within the 46.2-acre study area. As noted above, the small increase is based upon worst-case assumptions for land cover types. Without mitigation, the additional impervious surface would increase the volume of stormwater runoff, as there would be slightly less surface area for rainfall to percolate into the ground or be intercepted by vegetation. The increase in impervious surfaces is also associated with increased peak discharges, as the runoff moves more quickly over paved or other hard surfaces than it does over grass or vegetated surfaces. Finally, increased runoff is often associated with increase pollutant loading, depending on the land use of the contributing area, as the runoff picks up particles within its flow path. Pollutants associated with runoff may include sediment, deicing and anti-icing chemicals, phosphorus and other nutrients due to fertilizers, hydrocarbons and other chemicals associated with automobiles, and litter, as well as other pollutants.

3.4.2.3 Mitigation

Stormwater BMPs will be constructed to manage runoff from the Proposed Project. Potential BMPs being explored include underground perforated pipe galleries, hydrodynamic separators (also known as water quality treatment manholes), tree trenches with Stockholm or similar soil, permeable pavement, infiltration beds, and rainwater harvesting. Determination of the BMPs to be used will be made during final design of each block. Stormwater BMPs will be designed and constructed to

comply with the applicable regulatory requirements that will be in effect at the time each block will be permitted and constructed. **Table 3.4-3** documents the required water quality volume to meet current City of Minneapolis standards. Peak discharge rates will also be managed such that there is no increase of the peak discharge rates of the No Action conditions. Therefore, water quality may be improved over that of the No Action conditions.

Table 3.4-3. Required Water Quality Volume for 1.25-inch Rainfall

Storm Drainage Block	Drainage Area (acres)	Runoff Curve Number	Runoff Depth (inches)	Water Quality Volume (cubic feet)
New Stadium Block	24.19	96	0.83	72,947
Downtown East Block	2.89	98	1.03	10,853
McClellan Block	2.89	98	1.03	10,853
McGrew – Easterly Block	1.14	98	1.03	4,281
McGrew – Westerly Block	1.57	98	1.03	5,896
Medical Examiner Building	2.7	96	0.86	8,425
First Covenant Church Partial Block	1.2	98	1.03	4,487
East/West Alternate Plaza Configuration	5.81	98	1.03	21,819

3.4.2.4 No Action Alternative

With the No Action Alternative, there would be no change to the existing stormwater conditions and no consideration of BMPs to potentially improve stormwater runoff quantity and quality.

3.4.3 Receiving Water Bodies

3.4.3.1 Affected Environment

Runoff from the Proposed Project drains into several municipal and MnDOT storm drain systems before discharging into the Mississippi River. There are three separate outfalls to the River, two of which are roughly in line with Chicago and 11th Avenues, respectively, and the third being just downstream of the I-35W Bridge. At these locations, the River is considered impaired for mercury, PCB, and fecal coliform, but it is not currently impaired for any parameters that would be exacerbated by construction of the Proposed Project. There are approximately 36,800 square miles that drain into the Mississippi River upstream of the MnDOT storm tunnel outfall.

In the No Action condition, the field is at or below the groundwater elevation, and there is a permanent dewatering program in place. Currently, the groundwater is pumped and discharged to the municipal sanitary sewer system. See Section 3.2 for more discussion on the existing dewatering system and potential changes with the Proposed Project.

3.4.3.2 Environmental Consequences

Given the large area that drains into the Mississippi River upstream of the Proposed Project, changes in peak discharge rates and runoff volumes are unlikely to have a significant effect on the flow rates and water levels within the river channel. However, potential impacts to the existing public infrastructure that conveys runoff from the Proposed Project must be taken into account.

3.4.3.3 Mitigation

The Proposed Project will implement stormwater BMPs at various locations throughout the Proposed Project area. The potential BMPs have yet to be determined, but it is likely that underground infiltration galleries will be one of the primary BMPs selected. If sized appropriately for the contributing area, this BMP will provide volume retention, rate control, and water quality treatment with up to 100% of Total Suspended Solids (TSS) and Total Phosphorus captured for the water quality event. Additional soil borings are required to understand if infiltration is possible at these locations. If during design it is determined that infiltration is not possible, other types of BMPs will be implemented. These may include bioretention, water quality manholes, tree trenches, and rainwater harvesting. These provide a varying degree of stormwater management. Water quality manholes typically provide the lowest level of water quality treatment and do not provide volume retention or rate control.

3.4.3.4 No Action Alternative

Under the No Action Alternative there would be no change to the existing stormwater conditions and no consideration of BMPs to potentially improve stormwater runoff quantity and quality.

3.5 Water Quality: Wastewaters

3.5.1 Wastewater Production and Associated Infrastructure

3.5.1.1 Affected Environment

The City of Minneapolis owns and operates a public sanitary sewer system that provides service to the new Stadium site. The City sanitary sewer network in the vicinity of the new Stadium site consists of an existing 54 inch sewer in Chicago Avenue and a 10 inch sewer in 11th Avenue. See **Figure 3.2-1** for existing utility information. These City sewers ultimately discharge into the Metropolitan Council Environmental Services (MCES) interceptor sewer (1-MN-310) under Washington Avenue. The MCES interceptor has a capacity of 120 million gallons per day (mgd). In 2005 the average daily flow was less than 40 mgd, and peak flow was less than 70 mgd.

The peak monthly wastewater generated by the Metrodome is three million gallons, based on the MSFC July 26, 2011 utility invoice. Annual wastewater generated by the Metrodome is 18 million gallons, based on MSFC utility invoices from June 2011 through May 2012.

3.5.1.2 Environmental Consequences

The existing sanitary services that serve the Metrodome are proposed to be replaced by four new sanitary sewer connections: three new service connections (two 12 inch and one 10 inch) to the 54 inch sewer in Chicago Avenue and a new 10 inch connection to the 10 inch sewer in 11th Avenue. All but the lower three levels of the new Stadium will flow by gravity to the public sanitary sewer system. The lower three levels will be pumped into the public sanitary sewer system.

The estimated peak sanitary sewer flow generated by the new Stadium is 2,000 gpd. A formal design submittal to the City of Minneapolis to determine the adequacy of the existing sanitary sewer system has not yet been made, and the City has not evaluated the capacity of their system.

The estimated peak monthly wastewater generated by the Proposed Project's new Stadium is approximately one million gallons, and the estimated annual wastewater generated by the new Stadium is approximately 10 million gallons.

The MCES has indicated that the MCES interceptor, and the downstream wastewater treatment plant, has adequate capacity to provide service to the new Stadium, based on the relatively small sewer flows from the new Stadium as compared with the magnitude of the interceptor excess capacity.

The Proposed Project does not propose any on-site cooling towers, therefore no cooling tower blow down will be generated.

The draft design plans currently indicate a pedestrian tunnel connection from the existing Downtown East Parking Ramp to the new Stadium. As currently designed, the tunnel crosses the existing 54 inch sanitary sewer in Chicago Avenue/Kirby Puckett Place.

3.5.1.3 Mitigation

The MSFA will submit to the City of Minneapolis the sanitary sewer design. The City will then determine the adequacy of the existing sanitary sewer system to provide service to the new Stadium. At this time, the MSFA has not identified any adverse effects associated with the Proposed Project on the capacity of the sanitary sewers. Therefore, no capacity mitigation measures are proposed.

The pedestrian tunnel proposed to connect the Downtown East Parking Ramp to the Proposed Project's new Stadium may be in conflict with the existing 54 inch sanitary sewer in Chicago Avenue/Kirby Puckett Lane. Final design plans will account for the existing sanitary sewer line and address any conflicts.

3.5.1.4 No Action Alternative

In the No Action Alternative the Metrodome would continue to function as it currently does. No changes to the wastewater system would be required to continue to allow the Metrodome to function.

3.6 Site-Generated Waste

3.6.1 Background

3.6.1.1 Purpose

Existing environmental hazards posed by known or potential historical chemical releases are addressed in Section 3.1. This section discusses potential environmental hazards associated with demolition, construction, and operation activities within the Proposed Project area.

3.6.1.2 Organization

Within each subheading of Section 3.6.2 below, potential environmental hazards are subdivided into the following categories:

- Solid waste
- Hazardous and regulated waste

3.6.2 Affected Environment

3.6.2.1 Solid Waste

Demolition Phase

The Proposed Project would involve complete demolition of the Metrodome, including outlying facilities, neighboring buildings, city streets, and underground infrastructure, which will generate the following solid wastes:

- It is anticipated that large quantities of demolition debris and earth materials would be generated during demolition.
  - Demolition debris is inert material such as concrete, brick, bituminous, glass, plastic, untreated wood, and rock.

  - It is estimated that the demolition would generate 80,000 tons of concrete debris, 2,600 tons of separated steel, and 3,500 tons of miscellaneous demolition debris.
- It is estimated that 95 percent to 98 percent of the solid wastes generated during demolition would be recycled.
- The remainder would be disposed at a state permitted landfill.
- The Proposed Project would also involve the demolition of the existing Star Tribune building on the block bounded by 4th and 5th Streets, and Park and Portland Avenues (this is not included in the demolition debris and recycling quantities above).

Construction Phase

Construction of the Proposed Project's new Stadium would generate construction-related waste materials such as wood, packaging, excess materials, and other wastes, which would be either recycled or disposed.

Operation Phase

New Stadium operations would generate solid wastes such as food waste, packaging, beverage containers, paper, and other wastes, similar to the current Metrodome operation.

3.6.2.2 Hazardous and Regulated Waste

Demolition Phase

Hazardous waste is not anticipated to be generated during Proposed Project demolition, except as follows:

- Abatement and removal of regulated materials such as asbestos, lead-based paint, refrigeration equipment, lights, or other regulated wastes would be necessary if they are encountered during demolition.
  - As part of the Proposed Project, a pre-demolition survey would be completed on the existing structures to determine the environmental hazards that could be encountered during demolition of the Metrodome and other properties defined under the Proposed Project, and in removing and disposing of construction debris.

Construction Phase

Site preparation for the Proposed Project's new Stadium would generate large quantities of earth materials (possibly 100,000 cubic yards or more) which would require proper management or disposal. The environmental review has identified potential contamination in soil and water within the Proposed Project area, which would require advanced planning for proper management and disposal of impacted materials as detailed in Section 3.1.2.4.

Operation Phase

The Proposed Project's new Stadium operations would use small quantities of petroleum and other toxic or hazardous substances, which would be properly managed and disposed according to state and local regulations. For instance:

- The Metrodome property is identified as a Small Quantity Generator of hazardous wastes, which consists of Waste Code D1 "ignitable hazardous wastes" amounting to less than 100 kilograms per calendar month. These types of *de minimis* uses do not typically lead to regulated waste releases, discharges, or emissions.
- Two 660 gallon tanks are planned to be used for storage of diesel fuel for a standby electric generator at the new Stadium. The Metrodome property is identified as a registered Underground Storage Tank facility with two 1,000 gallon tanks containing diesel fuel. Registered

storage tanks are required to comply with federal and state regulations for installation and system monitoring.

3.6.3 Environmental Consequences

3.6.3.1 Solid Waste

Demolition and Construction Phases

If solid waste recycling falls short of the 95 percent to 98 percent projections, the Proposed Project would require disposal of solid waste materials at area landfills, thereby shortening the operating life of those landfill facilities. Handling, transportation, and disposal of solid wastes generated during the demolition, site preparation, and construction of the Proposed Project would also result in transient environmental consequences in the areas of traffic; vehicle-related air emissions; odors, noise, and dust; soil conditions; surface water runoff; erosion and sedimentation; and visual impacts.

Operation Phase

The Proposed Project's new Stadium operations would generate solid wastes on an ongoing basis, similar to the Metrodome.

3.6.3.2 Hazardous and Regulated Waste

Demolition Phase

If hazardous or regulated waste materials are discovered during demolition, those materials are required to be handled through established federal and state abatement, mitigation, disposal, and recycling procedures.

Construction Phase

Site preparation for the Proposed Project may result in excavated soils which are contaminated and would require disposal at area landfills. The consequences would be identical to those stated above for solid waste.

Operation Phase

Stadium operation would generate small quantities of hazardous wastes on an ongoing basis, similar to the Metrodome as described above in Section 3.6.2.2.

3.6.4 Mitigation

3.6.4.1 Solid Waste

Demolition and Construction Phases

Mitigation measures for potential environmental hazards associated with solid waste generated during demolition and construction of the Proposed Project include the following:

- Solid waste materials generated during demolition, site preparation, and construction must be disposed in an MPCA-approved demolition landfill, or separated and recycled. Management of solid waste would be in accordance with state statutes and regulations.
- To the extent feasible, demolition debris and salvaged materials would be segregated into alternate waste streams for recycling/reuse.
  - Much of the concrete would be crushed for reuse on- or off-site as aggregate fill material.
  - Soils meeting MPCA unregulated fill criteria may also be reused.
  - Steel and other metals would be salvaged and recycled.

- A plan for solid waste stream management would be prepared for the Proposed Project which would emphasize recycling/reuse of demolished materials to the extent feasible.

Operation Phase

For the Proposed Project's new Stadium operations phase, a recycling center would be established to encourage recycling of metals, plastics, paper, and other materials. Wastes that cannot be recycled would be managed in accordance with state regulations and guidelines.

3.6.4.2 Hazardous and Regulated Waste

Demolition and Construction Phases

Mitigation measures for the identified potential environmental hazards associated with hazardous and regulated waste during demolition and construction include the following:

- Any buildings to be removed for the Proposed Project would be inspected for hazardous and regulated materials, and these materials would be abated or removed prior to demolition. The removed hazardous wastes would be managed and recycled or disposed of by certified contractors in compliance with federal and state statutes and regulations.
- Any hazardous and regulated waste generated during construction would be managed according to federal, state, and local statutes and regulations. Construction hazardous waste generation would be minimized by specifying non-hazardous materials where possible.
- Any contaminated soil or water discovered during assessments or removed during the construction would be managed according to federal, state, and local statutes and regulations.
  - Disposal of low-level-contaminated soils would occur at an acceptable regulated fill soil site or MPCA-approved landfill.
  - Disposal of higher-level-contaminated soils would occur at an MPCA-approved sanitary landfill.
  - Contaminated water recovered during construction (e.g., during dewatering) would be treated by a qualified contractor to state standards, prior to a permitted discharge event.
- If previous unknown regulated materials or wastes are discovered during construction, the Contractor would notify the MSFA immediately. The MSFA would notify regulatory authorities as required and take appropriate actions to manage the regulated materials or wastes.
- It is expected that temporary aboveground storage tanks (ASTs) would be utilized on-site to store petroleum products and other materials during construction.
  - Any storage tanks would be protected with secondary containment and designed to meet all regulatory requirements including spill and overfill protection, leak monitoring, corrosion protection, etc.
  - These tanks would be monitored on a regular basis, and spill containment would be incorporated into the design of the tanks.
  - Spill containment and cleanup materials would be stored on-site to contain and cleanup small spills.
- If abandoned underground storage tanks (USTs) or other storage structures are encountered during site preparation activities, they and their contents would be assessed, removed, and disposed according to MPCA and local statutes and regulations.
- A management plan would be developed for the Proposed Project to minimize impacts to soils and groundwater in the event a release of hazardous substances occurs during construction. If a

release were to occur, the MSFA will comply with federal and statute release reporting statutes and regulations.

Operation Phase

To the extent feasible, alternative non-hazardous materials would be used for Proposed Project facility maintenance to minimize generation of hazardous and regulated wastes resulting from facility operations.

3.6.5 No Action Alternative

Under the No Action Alternative additional solid waste would not be generated for disposal. The mitigation measures to manage solid, hazardous, and regulated waste would continue for the Metrodome as occurs today.

Given the limited scope of previous environmental assessments and building pre-demolition inspections in the Proposed Project area, the degree of inherent risk from land use environmental hazards is not certain. The potential would remain for disturbance or neglect within the Proposed Project area to affect human health and the environment at affected properties and potentially off-site.

3.7 Transportation

3.7.1 Vehicle Traffic Analysis

As part of this EIS, a study of the traffic-related issues associated with the Proposed Project was completed. To determine the impacts of the Proposed Project on the local roadway network compared to the impacts of the Metrodome, a traffic operations analysis was conducted for intersections and parking facilities within the vicinity of the new Stadium for many different event and non-event scenarios. In addition, a freeway operations analysis was completed to determine the impacts that event traffic would have on the regional freeway network. For the purposes of this section, the terms “event” or “NFL event” are intended to mean any capacity event at the new Stadium.

For a complete technical analysis of the traffic issues associated with this Proposed Project, please refer to the *Minnesota Multi-Purpose Stadium Traffic and Parking Technical Memorandum* (May 2013).

3.7.1.1 Analysis Scenarios

Several different scenarios were analyzed to identify the potential impacts of the Proposed Project compared to the Metrodome use. Those scenarios are:

- Weekday AM peak hour (non-event)
- Weekday PM peak hour (non-event)
- Weekend (Sunday) event arrival
- Weekend (Sunday) event departure
- Weekday (Monday or Thursday evening) event arrival coinciding with the PM peak hour
- Weekend (Sunday) event arrival with Park Avenue/Portland Avenue closures between 4th Street and 5th Street

Background (non-event) traffic levels for a 12:00 PM game start compared with a 3:00 PM or 6:00 PM game start were similar; therefore, only one weekend event arrival scenario was analyzed. Similarly, background traffic volumes for both weekend and weekday event departures were similar,

so only one departure scenario was analyzed. Traffic operations were analyzed for one hour of the pre-event arrival period and one hour of the post-event departure period.

Each of the above event scenarios was analyzed for the No Action (existing Metrodome) and Proposed Project conditions in year 2017 (one year after opening of the new Stadium) and 2030 (forecast year). In addition, each Proposed Project scenario was analyzed for two possible parking plans, for a total of 32 separate scenarios. The parking plans are discussed further in Section 3.7.1.4.

3.7.1.2 Assumptions and Methodology

The traffic analysis in the Proposed Project study area is generally bounded by Washington Avenue to the north, the I-35W corridor on the east side of downtown Minneapolis, 10th Street to the south, and the I-394 corridor on the west side of downtown Minneapolis. The specific intersections analyzed for each scenario are discussed within the following sections. Most of the intersections included in the analysis are currently signalized and are assumed to remain signalized in the future conditions.

In addition to the Proposed Project, several independent infrastructure improvements are planned within the traffic analysis study area for the Proposed Project.

- A signal timing optimization project that includes all signalized intersections in downtown Minneapolis is being led by the City of Minneapolis and will be implemented in 2013. The project includes timing plans for AM peak, PM peak, off-peak, and an event plan for Target Field. The existing event plan extends to 2nd Avenue South to the east, and therefore does not include the area around the new Stadium.
- A project led by Hennepin County will construct a new freeway entrance ramp from 4th Street South to I-35W northbound and is currently planned to be completed by 2014.
- The Central Corridor LRT line will share the existing Hiawatha LRT alignment within the study area, utilizing the same stations. This project is being led by Metro Transit and is planned to open in 2014.

The *Access Minneapolis Ten-Year Transportation Action Plan* identifies several other potential future recommended roadway improvements near the study area that have not been included in the analysis of the Proposed Project because they are not currently programmed or funded. The potential improvements as identified in the plan are as follows:

- Two-way operations on Park Avenue South and Portland Avenue South
- Two-way operations on 9th Street South and 10th Street South, east of 5th Avenue South
- New exit ramp from westbound I-94 to 7th Street South
- Changes to Washington Avenue South and 3rd Street South interchanges at I-35W

The assumptions for each of the analysis scenarios are summarized in **Tables 3.7-1** and **Table 3.7-2** below.

Table 3.7-1. Non-Event Analysis Assumptions

Analysis Parameter	Assumption
Background Growth Rate	0.5% per year
Traffic Volumes	Existing peak hour turning movement volumes
Signal Timing	AM peak – proposed AM peak plan PM peak – proposed PM peak plan

Table 3.7-2. Event Analysis Assumptions

Analysis Parameter	Assumption
Stadium Capacity	65,000 attendees No Action 73,000 attendees Build
Background Growth Rate	0.5% per year
Background Traffic	Weekday event arrival – 100% of PM peak hour Weekend event arrival – 25% of AM peak hour Weekend event departure – 25% of PM peak hour
Event Mode Split	500 attendees – No Action walk/bike 1,000 attendees – Proposed Project walk/bike 500 attendees – Metro Transit regular bus routes 1,850 attendees – Metro Transit express bus 2,000 attendees – charter bus 11,810 attendees – No Action LRT and Commuter Rail (2017) 16,410 attendees – Proposed Project LRT and Commuter Rail (2017) 26,410 attendees – No Action LRT and Commuter Rail (2030) 31,010 attendees – Proposed Project LRT and Commuter Rail (2030)
Event Auto Occupancy	2.75
Event Peak Arrival	PM peak hour (4:30-5:30 PM) coincides with peak event arrival for 7:00 PM weekday game start
	10:30-11:30 AM for a 12:00 PM weekend game start 50% attendees arrive in peak hour
Event Peak Departure	3:00-4:00 PM for a 3:00 PM weekend game end 70% attendees depart in peak hour
Event Signal Timing	Weekday event arrival – proposed PM peak plan Weekend event arrival – proposed AM peak plan Weekend event departure – proposed PM peak plan

The number of permanent seats in the Proposed Project's new Stadium is planned to be approximately 65,500 but with the ability to expand to 73,000 seats through the use of temporary seating inside the new Stadium. Therefore all scenarios were analyzed for a capacity event of 73,000 attendees as a worst case scenario.

The number of attendees using transit to travel to and from NFL events was based on ridership forecasts provided by Metro Transit in December 2012. The 2017 ridership forecasts include the Hiawatha LRT, Central Corridor LRT, and Northstar commuter rail lines. The 2030 ridership forecasts also include the Southwest LRT and Bottineau LRT lines.

The trip distribution and routes of vehicular traffic arriving to and departing from an NFL event were based on the distribution of existing Vikings season ticket holders, as well as traffic counts conducted during NFL events in fall 2012. The event traffic distribution is shown in **Figure 3.7-1**.

The traffic operations analysis was completed in Synchro/SimTraffic, a software program that applies the methodologies of the *Highway Capacity Manual*. This tool was used to evaluate intersection volume/capacity ratio, operations, level of service, and queuing. Level of service (LOS) is a rating system that describes how well an intersection operates. LOS A operations indicate the best traffic operations (little delay) and LOS F indicates an intersection that is failing to operate

effectively. Operations of LOS D or better are generally considered acceptable to drivers under peak conditions.

3.7.1.3 Local Roadway Network – Weekday Non-Event Analysis

The analysis of the weekday peak hour non-event conditions was used to identify the impacts of the closure of 5th Street between 11th Avenue and Chicago Avenue or Park Avenue. This segment of 5th Street currently carries approximately 2,900 vehicles per day and the surrounding transportation network will need to absorb this traffic. All analysis was completed for 2017, one year after Stadium opening, and the future year 2030. The intersections included in the analysis were discussed with the City of Minneapolis and were determined by examining the corridors within the area as well as known driver behavior and traffic patterns. The intersections included in the weekday non-event analysis are shown in **Figure 3.7-2**.

Sensitivity testing was performed using the Metropolitan Council regional travel demand model to determine if the permanent closure of this segment of 5th Street would be expected to result in changes to the traffic volumes on the regional transportation network. This could occur if, for example, a driver on westbound I-94 decided to use the 11th Street South exit rather than the 5th Street South exit into downtown Minneapolis. The regional model showed that with 5th Street closed, the traffic volume change on any freeway mainline segment or ramp was less than 500 vehicles per day. The existing daily volume on the 11th Street South exit ramp is approximately 15,000 vehicles per day, and therefore even 500 vehicles per day would represent a very minor change that would likely not be distinguishable from the daily variability in volume. Therefore, the 5th Street closure would be expected to have very little, if any, impact on the regional transportation network, and no further analysis of the freeway system was completed for this scenario.

Two roadway network options were analyzed for the 5th Street closure:

- Option 1: 5th Street traffic rerouted to Washington Avenue and 7th Street
- Option 2A: 5th Street traffic rerouted onto a new westbound lane ("contraflow" lane) on 6th Street, which is currently a one-way eastbound roadway, to Chicago Avenue
- Option 2B: 5th Street traffic rerouted onto a new westbound lane ("contraflow" lane) on 6th Street, which is currently a one-way eastbound roadway, to Park Avenue

Under all options, the 5th Street/11th Avenue signalized intersection was assumed to be reconfigured and realigned to be a perpendicular intersection with three westbound lanes (one right-turn and two left-turn lanes). The realignment of the intersection provides improved approach geometry on 5th Street as well as providing greater queuing distance on 11th Avenue between 5th Street and 6th Street. The segment of 11th Avenue south of 5th Street was also assumed to be modified to include a second southbound lane to 7th Street (Option 1) or 6th Street (Options 2A/2B) to facilitate the additional traffic volumes in these blocks.

The assumptions regarding traffic rerouting and geometrics are described in the following paragraphs.

Option 1 Assumptions

For the purposes of the analysis, all traffic on 5th Street was assumed to use either 7th Street or Washington Avenue. This is a worst case scenario since drivers could choose other routes based on their ultimate destination. Based on existing peak hour turning movement volumes, in the AM peak approximately 50 percent of traffic on 5th Street was assumed to reroute to 7th Street and 50 percent was assumed to reroute to Washington Avenue, both via 11th Avenue. In the PM peak approximately 60 percent of traffic on 5th Street was assumed to reroute to 7th Street and 40 percent was assumed to reroute to Washington Avenue, both via 11th Avenue. Traffic diverted to 7th Street and Washington Avenue was assumed to turn at the intermediate intersections along the route, similar to

the existing travel patterns on 5th Street. The remaining rerouted traffic on 7th Street was assumed to use Park Avenue to return to the 5th Street area, and traffic diverted to Washington Avenue was assumed to use Portland Avenue to return to the 5th Street area. Since it is likely that not all traffic has destinations on 5th Street and would choose to go back to the 5th Street corridor, this is a conservative assumption that represents the worst case.

To accommodate the increased westbound left-turn volume on 5th Street and southbound volume on 11th Avenue, an additional southbound lane was assumed that ends as a right-turn only lane at 7th Street. The improved geometrics for Option 1 are shown in **Figure 3.7-3**.

Option 2 Assumptions

In the Option 2 scenarios, all traffic on 5th Street was assumed to use the 6th Street contraflow lane, via 11th Avenue, with the exception of traffic destined for southbound Chicago Avenue, which was assumed to use 7th Street. This assumption was made due to the difficulty of making a westbound left-turn movement from the 6th Street contraflow lane onto Chicago Avenue, which would cross three lanes of opposing eastbound traffic. This movement would likely experience delays due to the lack of gaps in eastbound traffic, and therefore drivers would likely choose an alternate route (7th Street). Traffic diverted to 6th Street was assumed to use Chicago Avenue or Park Avenue to return to 5th Street.

To accommodate the increased westbound left-turn volume on 5th Street and southbound volume on 11th Avenue, an additional southbound lane was assumed that ends as a right-turn only lane at 6th Street. A westbound right-turn lane was also assumed on 6th Street at Chicago Avenue (Option 2A) or Park Avenue (Option 2B). The improved geometrics for Option 2 are shown in **Figure 3.7-4**.

Results

The results of the Weekday Non-Event scenario modeling for year 2017 are shown in **Table 3.7-3** and **Table 3.7-4**. The LOS results for year 2030 are provided in **Table 3.7-5** and **Table 3.7-6**.

As shown by the intersection LOS results, all the options have one or more intersections with poor operations. Under Option 1, the Washington Avenue/11th Avenue intersection is expected to operate over capacity in the AM and PM peak hours, primarily due to the increase in northbound left-turn traffic from 5th Street. However, the intersection would already be expected to operate at LOS F in the No Action PM Peak hour conditions, with 5th Street open to traffic.

Under Option 2, the 5th Street/11th Avenue intersection is expected to operate over capacity in the AM peak hour and the Washington Avenue/11th Avenue intersection is expected to operate over capacity in the PM peak hour. However, both intersections were also shown to operate poorly in the No Action peak hour conditions; therefore, the poor operations are not caused by the permanent closure of 5th Street.

Table 3.7-3. 2017 Weekday Non-Event Analysis Results – AM Peak

Intersection	Overall Intersection Level of Service			
	No Action	Option 1 – Reroute to 7th St and Washington Ave	Option 2A – Contraflow to Chicago Ave	Option 2B – Contraflow to Park Ave
Washington Ave S/11th Ave S	D	**F**	D	D
Washington Ave S/Chicago Ave S	C or better	C or better	C or better	C or better
Washington Ave S/Park Ave S	C or better	C or better	C or better	C or better
Washington Ave S/Portland Ave S	C or better	C or better	C or better	C or better
5th St S/11th Ave S	**F**	**F**	**F**	**F**
5th St S/Chicago Ave S	C or better	C or better	C or better	C or better
5th St S/Park Ave S	C or better	C or better	C or better	C or better
5th St S/Portland Ave S	C or better	C or better	C or better	C or better
6th St S/11th Ave S	C or better	C or better	C or better	C or better
6th St S/Chicago Ave S	C or better	C or better	D	C or better
6th St S/Park Ave S	C or better	C or better	C or better	C or better
7th St S/11th Ave S	C or better	C or better	C or better	C or better
7th St S/Chicago Ave S	C or better	D	C or better	C or better
7th St S/Park Ave S	C or better	C or better	C or better	C or better
7th St S/Portland Ave S	C or better	C or better	C or better	C or better
Total Number of Intersections Operating at Each Level of Service				
Level of Service C or better	13	12	12	13
Level of Service D	1	1	2	1
Level of Service E	0	0	0	0
Level of Service F	1	2	1	1

Table 3.7-4. 2017 Weekday Non-Event Analysis Results – PM Peak

Intersection	Overall Intersection Level of Service			
	No Action	Option 1 – Reroute to 7th St and Washington Ave	Option 2A – Contraflow to Chicago Ave	Option 2B – Contraflow to Park Ave
Washington Ave S/11th Ave S	**F**	**F**	**F**	**F**
Washington Ave S/Chicago Ave S	C or better	C or better	C or better	C or better
Washington Ave S/Park Ave S	C or better	C or better	C or better	C or better
Washington Ave S/Portland Ave S	C or better	C or better	C or better	C or better
5th St S/11th Ave S	C or better	C or better	C or better	C or better
5th St S/Chicago Ave S	C or better	C or better	C or better	C or better
5th St S/Park Ave S	C or better	D	C or better	C or better
5th St S/Portland Ave S	C or better	C or better	C or better	C or better
6th St S/11th Ave S	C or better	C or better	C or better	C or better
6th St S/Chicago Ave S	C or better	C or better	C or better	C or better
6th St S/Park Ave S	C or better	C or better	C or better	C or better
7th St S/11th Ave S	C or better	C or better	C or better	C or better
7th St S/Chicago Ave S	C or better	C or better	C or better	C or better
7th St S/Park Ave S	C or better	C or better	C or better	C or better
7th St S/Portland Ave S	C or better	C or better	C or better	C or better
Total Number of Intersections Operating at Each Level of Service				
Level of Service C or better	14	13	14	14
Level of Service D	0	1	0	0
Level of Service E	0	0	0	0
Level of Service F	1	1	1	1

Table 3.7-5. 2030 Weekday Non-Event Analysis Results – AM Peak

Intersection	Overall Intersection Level of Service			
	No Action	Option 1 – Reroute to 7th St and Washington Ave	Option 2A – Contraflow to Chicago Ave	Option 2B – Contraflow to Park Ave
Washington Ave S/11th Ave S	**F**	**F**	**E**	**E**
Washington Ave S/Chicago Ave S	C or better	C or better	C or better	C or better
Washington Ave S/Park Ave S	C or better	C or better	C or better	C or better
Washington Ave S/Portland Ave S	C or better	C or better	C or better	C or better
5th St S/11th Ave S	**F**	**F**	**F**	**F**
5th St S/Chicago Ave S	C or better	C or better	C or better	C or better
5th St S/Park Ave S	C or better	C or better	C or better	C or better
5th St S/Portland Ave S	C or better	D	C or better	C or better
6th St S/11th Ave S	C or better	C or better	C or better	C or better
6th St S/Chicago Ave S	C or better	C or better	**E**	C or better
6th St S/Park Ave S	C or better	C or better	C or better	C or better
7th St S/11th Ave S	C or better	C or better	C or better	C or better
7th St S/Chicago Ave S	C or better	D	C or better	C or better
7th St S/Park Ave S	C or better	C or better	C or better	C or better
7th St S/Portland Ave S	C or better	C or better	C or better	C or better
Total Number of Intersections Operating at Each Level of Service				
Level of Service C or better	13	11	12	13
Level of Service D	0	2	0	0
Level of Service E	0	0	2	1
Level of Service F	2	2	1	1

Table 3.7-6. 2030 Weekday Non-Event Analysis Results – PM Peak

Intersection	Overall Intersection Level of Service			
	No Action	Option 1 – Reroute to 7th St and Washington Ave	Option 2A – Contraflow to Chicago Ave	Option 2B – Contraflow to Park Ave
Washington Ave S/11th Ave S	**F**	**F**	**F**	**F**
Washington Ave S/Chicago Ave S	C or better	C or better	C or better	C or better
Washington Ave S/Park Ave S	C or better	C or better	C or better	C or better
Washington Ave S/Portland Ave S	C or better	C or better	C or better	C or better
5th St S/11th Ave S	C or better	D	D	D
5th St S/Chicago Ave S	C or better	C or better	C or better	C or better
5th St S/Park Ave S	D	**E**	D	D
5th St S/Portland Ave S	C or better	C or better	C or better	C or better
6th St S/11th Ave S	C or better	C or better	C or better	C or better
6th St S/Chicago Ave S	C or better	C or better	D	D
6th St S/Park Ave S	C or better	C or better	C or better	C or better
7th St S/11th Ave S	C or better	C or better	C or better	C or better
7th St S/Chicago Ave S	C or better	C or better	C or better	C or better
7th St S/Park Ave S	C or better	C or better	C or better	C or better
7th St S/Portland Ave S	C or better	C or better	C or better	C or better
Total Number of Intersections Operating at Each Level of Service				
Level of Service C or better	13	12	11	11
Level of Service D	1	1	3	3
Level of Service E	0	1	0	0
Level of Service F	1	1	1	1

Mitigation Measures

The following summarizes the impacts expected as a result of the permanent closure of 5th Street next to the new Stadium, as well as recommended mitigation measures to improve traffic operations.

- Option 1
  - The current phasing of the 5th Street/Park Avenue intersection limits the northbound Park Avenue approach to approximately 30 seconds due to the LRT and the resulting unique geometrics and phasing at the intersection. An additional five seconds should be added to the northbound split to accommodate the expected increase in northbound traffic on Park Avenue. This is not expected to significantly impact the LRT, 5th Street, or pedestrian traffic at the intersection.

- Additional capacity is needed on 11th Avenue from 5th Street to 7th Street to accommodate the rerouted 5th Street traffic. This will require restriping of the existing roadway section, including the existing bike lane, and removal of the existing metered on-street parking between 5th Street and 7th Street. The additional lane would end as a right-turn only lane at 7th Street.
- Capacity improvements were analyzed at the Washington Avenue/11th Avenue intersection to better accommodate the increased northbound left-turn traffic. These improvements included adding a second northbound left-turn lane or modifying the signal phasing to split phased for northbound/southbound. While these changes increased the capacity of the northbound movements, they had significant negative operational impacts on the southbound 11th Avenue movements and on the overall intersection delay. Therefore, capacity improvements are not recommended at the Washington Avenue/11th Avenue intersection.
- Modifications to the existing traffic signals at 5th Street/11th Avenue and 5th Street/Chicago Avenue will be needed to accommodate the changed intersection geometrics and traffic flow as a result of the 5th Street closure.

- Option 2
  - Additional capacity is needed on 11th Avenue from 5th Street to 6th Street to accommodate the rerouted 5th Street traffic. This would require restriping of the existing roadway section, including the existing bike lane. The additional lane would end as a right-turn only lane at 6th Street.
  - Existing metered parking spaces on 6th Street will need to be removed from 11th Avenue to Chicago Avenue or Park Avenue to accommodate the westbound contraflow lane. This would require restriping of the existing roadway and consideration to the appropriate location for the bike lane within the roadway section.
  - Modifications to the existing traffic signals at 5th Street/11th Avenue, 6th Street/Chicago Avenue, 6th Street/Park Avenue (if contra-flow lane extended to Park Avenue), and 5th Street/Chicago Avenue to accommodate the changed geometrics and traffic flow as a result of the 5th Street closure.

3.7.1.4 Local Roadway Network – Event Analysis

The event analysis was used to identify the impacts of the Proposed Project on the local roadway network, compared with the impacts of the existing Metrodome use. Field observations conducted in fall 2012 during a weekday and weekend NFL event provided the following information:

- Temporary road closures are currently used from approximately two hours before game start until about one hour after game end on the following segments:
  - 5th Street from 11th Avenue to Park Avenue
  - 4th Street from Park Avenue to Norm McGrew Place
  - Chicago Avenue from 3rd Street to 6th Street
  - Norm McGrew Place from 3rd Street to 4th Street
- The temporary road closures are accomplished using City of Minneapolis dump trucks, traffic control officers, and movable barricades.
- Traffic control officers are currently used at the following intersections:
  - 4th Street/Chicago Avenue (LRT crossing)

- 4th Street/Park Avenue
- 5th Street/11th Avenue
- 5th Street/Park Avenue
- 6th Street/11th Avenue
- 6th Street/Chicago Avenue

- Event arrival was generally uncongested.
- Pedestrian flows are heaviest along 4th Street, 6th Street, and 11th Avenue. Washington Avenue, 3rd Street, and 5th Street also appeared to be secondary routes. With 4th Street closed east of Park Avenue, pedestrians utilize the roadway to walk towards the Metrodome. Pedestrian flows appeared to be highest in the ½ hour immediately before game start and 15 minutes immediately after game end.
- The large volumes of pedestrian crossings at key intersections impacted traffic turning movements, including 6th Street/Chicago Avenue, 6th Street/11th Avenue, 4th Street/Chicago Avenue, and Washington Avenue/Chicago Avenue.
- Approximately 10-12 officers are used at 4th Street/Chicago Avenue before and after games to safely control pedestrians at the LRT crossing. This has been identified by Metro Transit as a significant operational and safety concern.
- Vehicles frequently queue across the 11th Avenue LRT crossing during both arrival and departure. Officers are also used at this location.
- Bus activity and vehicle drop-offs contributed to the congestion on 11th Avenue. Queues frequently extended through the 5th Street and 6th Street intersections.
- Event departures resulted in significant congestion on Washington Avenue, 11th Avenue, 6th Street, and Park Avenue. Many intersections experienced issues with queue spillback, particularly on roadways approaching Washington Avenue and where turn movements conflict with major pedestrian movements. Vehicle congestion lasted approximately 1-1.5 hours after game end.
- Signing for transit ticket sales and signing for the boarding queues is relatively minimal and not easily seen when exiting the Metrodome.
- Passenger queues for eastbound LRT and bus boarding extended out of the platform area and occupied most of the existing plaza area. The passenger queues for the eastbound LRT platform lasted approximately one hour after game end, with the queue extending out of the existing tent on the plaza and along Chicago Avenue, to approximately the 4th Street intersection.
- There is minimal queuing space for westbound LRT on the existing platform, and there is not adjacent space for queuing due to the grade difference between the platform and the top of the parking ramp on the northwest corner of the site.
- Express buses to park-and-ride locations along the Hiawatha LRT line are used to supplement the LRT capacity during the post-event departures.

The temporary road closures used for the Metrodome are assumed to continue to be used during NFL events at the new Stadium, for approximately the same duration.

In addition to increased capacity, the Proposed Project also includes the construction or designation of 2,500 reserved parking spaces adjacent to the Stadium site. As described previously, four event scenarios were analyzed. Based on input from the City of Minneapolis, a set of intersections were identified for each analysis scenario as shown in **Figures 3.7-5** through **3.7-8**. These figures also

show the local roadways that are proposed to be closed during NFL events. The roadways are temporarily closed due to NFL security guidelines, as well as traffic and pedestrian flows near and around the new Stadium site. The temporary closures generally begin two hours before the start of an NFL event and remain until one to two hours after the end of the event. However, the temporary closure of Park Avenue and Portland Avenue are assumed to occur from approximately two hours before the start of weekend events only, and will be reopened after the start of the event. These closures are proposed to provide a continuous park and plaza space prior to events. The temporary closures on Park Avenue and Portland Avenue are assumed to not occur prior to weekday evening games because of the overlap with the PM peak hour traffic flows that heavily utilize these roadways.

In order to provide 2,500 reserved parking spaces for NFL events, a combination of new parking is proposed to be built as part of the Proposed Project as well as designating existing parking spaces for stadium use during events. Two potential parking plans have been proposed to meet the need for 2,500 reserved parking spaces, as described in **Table 3.7-7** and shown in **Figure 3.7-9**. The new parking structures have not yet been designed, but the assumed access locations were based on preliminary information provided in the Proposed Project draft design plans.

Table 3.7-7. Proposed Reserved Parking Plans

Parking Facility	Existing Spaces	Proposed Spaces – Reserved Parking Plan A*	Proposed Spaces – Reserved Parking Plan B†	Assumed Access Locations
McGrew Block	340 (surface)	600 (structure)	500 (structure)	Ingress – 3rd Street Egress – McGrew Place and 4th Street
McClellan Block	250 (surface)	0	1,150 (structure) 660 reserved parking 490 public parking	Ingress/Egress – 3rd Street, Park Avenue
Downtown East Ramp	455 (structure)	455 (structure)	455 (structure)	Ingress/Egress – Park Avenue
1st Covenant Church Property	240 (surface)	560 (structure)	0	Ingress/Egress – Carew Drive
1010 Building Ramp	550 (structure)	585 (structure)	585 (structure)	Ingress/Egress – 10th Avenue
511 Building Ramp	350 (structure)	300 (structure)	300 (structure)	Ingress/Egress – 5th Street, 6th Street

* Parking Plan A reflects proposed parking under the North/South Alternate Plaza Configuration.
† Parking Plan B reflects proposed parking under the East/West Alternate Plaza Configuration.

Based on input from the Vikings, the trip distribution of reserved parking ticket holders was assumed to be the same as the trip distribution of all event attendees. In addition, parking was assumed to be purchased or assigned based on seat location, rather than on convenience of travel routes. The proposed ramp on the McGrew Block is assumed to have access to 4th Street east of Norm McGrew Place following events, while the segment of 4th Street to the west remains closed, in order to facilitate access out of the parking ramp and onto the freeway network.

The draft design plans show drop-off areas for the new Stadium along 6th Street and 4th Street. These driveways have the potential to disrupt traffic flow on 6th Street during event arrival and departure. All driveway accesses will likely need to be controlled by Stadium security or traffic control officers during events.

Results

The results of the Weekend Event scenario modeling are shown in **Tables 3.7-8** and **Table 3.7-9**. The results of the Weekend Event Park/Portland Closure scenario modeling for year 2017 are shown in **Table 3.7-10**. The results of the Weekday Event scenario modeling are shown in **Table 3.7-11**.

As shown by the intersection LOS results, the options typically have one or more intersections with poor operations. Under the Weekend Event arrival scenario, most intersections operate under capacity as a result of lower Sunday background traffic and a lower percent of peak hour arrivals due to pre-event tailgating and activities. In this scenario, the 4th Street North/2nd Avenue North intersection is expected to operate over capacity in both Plan A and Plan B, primarily due to the increase in traffic from I-94 and I-394. The temporary closures of Park Avenue and Portland Avenue are anticipated to cause limited operational issues; however, signal timing modifications are required to provide additional southbound capacity at the 5th Street/4th Avenue intersection.

Under the Weekend Event departure and Weekday Event arrival scenarios, several intersections operate poorly in the No Action condition. With the additional traffic generated by the larger Stadium, the 2017 Proposed Project scenarios also have several intersections over capacity. The Washington Avenue and 11th Avenue corridors have the worst delay due to I-35W and I-94 ramp access. Delay and spillback from these corridors impact adjacent intersections and arterials. With expected higher transit use in 2030, the Proposed Project scenarios are expected to operate with similar conditions to the No Action Alternative.

Table 3.7-8. Weekend Event Analysis Results – Arrival Peak

Intersection	Overall Intersection Level of Service					
	2017			2030		
	No Action	Parking Plan A	Parking Plan B	No Action	Parking Plan A	Parking Plan B
Washington Ave S/I-35W NB Ramp	C or better	C or better	C or better	C or better	C or better	C or better
Washington Ave S/I-35W SB Ramp	C or better	C or better	D	C or better	C or better	C or better
Washington Ave S/11th Ave S	C or better	C or better	C or better	C or better	C or better	C or better
Washington Ave S/3rd Ave S	C or better	C or better	C or better	C or better	C or better	C or better
Washington Ave N/3rd Ave N	C or better	C or better	C or better	C or better	C or better	C or better
3rd St S/Park Ave S	C or better	C or better	C or better	C or better	C or better	C or better
4th St S/Park Ave S	C or better	C or better	C or better	C or better	C or better	C or better
4th St N/2nd Ave N	D	**F**	**F**	C or better	C or better	D
5th St S/11th Ave S	C or better	C or better	C or better	C or better	C or better	C or better
6th St S/11th Ave S	C or better	C or better	C or better	C or better	C or better	C or better
6th St S/Chicago Ave S	C or better	C or better	C or better	C or better	C or better	C or better
6th St S/Park Ave S	C or better	C or better	C or better	C or better	C or better	C or better
6th St S/Portland	C or better	C or better	C or better	C or better	C or better	C or better

Intersection	Overall Intersection Level of Service					
	2017			2030		
	No Action	Parking Plan A	Parking Plan B	No Action	Parking Plan A	Parking Plan B
Ave S						
6th St N/Hennepin Ave N	C or better	C or better	C or better	C or better	C or better	C or better
6th St N/2nd Ave N	C or better	C or better	C or better	C or better	C or better	C or better
7th St S/11th Ave S	C or better	C or better	C or better	C or better	C or better	C or better
7th St S/Chicago Ave S	C or better	C or better	C or better	C or better	C or better	C or better
7th St S/Park Ave S	C or better	C or better	C or better	C or better	C or better	C or better
7th St S/5th Ave S	C or better	C or better	C or better	C or better	C or better	C or better
Total Number of Intersections Operating at Each Level of Service						
Level of Service C or better	18	18	17	19	19	18
Level of Service D	1	0	1	0	0	1
Level of Service E	0	0	0	0	0	0
Level of Service F	0	1	1	0	0	0

Table 3.7-9. Weekend Event Analysis Results – Departure Peak

Intersection	Overall Intersection Level of Service					
	2017			2030		
	No Action	Parking Plan A	Parking Plan B	No Action	Parking Plan A	Parking Plan B
Washington Ave S/Cedar Ave S	C or better	C or better	C or better	C or better	C or better	C or better
Washington Ave S/I-35W NB Ramp	C or better	C or better	C or better	C or better	C or better	C or better
Washington Ave S/I-35W SB Ramp	D	D	D	C or better	C or better	C or better
Washington Ave S/11th Ave S	**F**	**F**	**F**	**F**	**F**	**F**
Washington Ave S/Chicago Ave S	**F**	**F**	**F**	C or better	**E**	D
Washington Ave S/Park Ave S	**E**	**F**	**E**	C or better	D	D
Washington Ave S/Portland Ave S	C or better	D	C or better	C or better	C or better	C or better
Washington Ave S/3rd Ave S	C or better	D	C or better	C or better	C or better	C or better
Washington Ave N/Hennepin Ave N	C or better	C or better	C or better	C or better	C or better	C or better
Washington Ave N/3rd Ave N	C or better	C or better	C or better	C or better	C or better	C or better
3rd St S/Chicago Ave S	**F**	**F**	**F**	C or better	C or better	C or better
3rd St S/Park Ave S	**F**	**F**	**F**	C or better	D	D
3rd St S/3rd Ave S	**E**	**E**	**E**	C or better	D	D
3rd St N/2nd Ave N	C or better	C or better	C or better	C or better	C or better	C or better

Intersection	Overall Intersection Level of Service					
	2017			2030		
	No Action	Parking Plan A	Parking Plan B	No Action	Parking Plan A	Parking Plan B
4th St S/Park Ave S	**F**	**F**	**F**	C or better	**E**	**E**
5th St S/11th Ave S	D	**F**	**F**	C or better	**F**	**E**
6th St S/11th Ave S	**F**	**E**	**E**	C or better	D	D
6th St S/Chicago Ave S	D	**E**	**E**	C or better	D	C or better
6th St S/Portland Ave S	C or better	D	D	C or better	C or better	C or better
8th St S/11th Ave S	**E**	D	D	C or better	C or better	C or better
8th St S/Portland Ave S	C or better	C or better	C or better	C or better	C or better	C or better
8th St S/4th Ave S	C or better	C or better	C or better	C or better	C or better	C or better
Total Number of Intersections Operating at Each Level of Service						
Level of Service C or better	10	7	9	21	13	14
Level of Service D	3	5	3	0	5	5
Level of Service E	3	3	4	0	2	2
Level of Service F	6	7	6	1	2	1

Table 3.7-10. 2017 Weekend Event Park/Portland Closure Analysis Results – Arrival Peak

Intersection	Overall Intersection Level of Service		
	No Action	Parking Plan A	Parking Plan B
Washington Ave S/11th Ave S	C or better	C or better	D
Washington Ave S/Park Ave S	C or better	C or better	C or better
Washington Ave S/Portland Ave S	C or better	C or better	C or better
Washington Ave S/5th Ave S	C or better	C or better	C or better
Washington Ave S/4th Ave S	C or better	C or better	C or better
Washington Ave S/3rd Ave S	C or better	C or better	C or better
3rd St S/Park Ave S	C or better	C or better	C or better
3rd St S/Portland Ave S	C or better	C or better	C or better
3rd St S/5th Ave S	C or better	C or better	C or better
3rd St S/4th Ave S	C or better	C or better	C or better
4th St S/Park Ave S	C or better	C or better	C or better
4th St S/Portland Ave S	C or better	C or better	C or better
4th St S/5th Ave S	C or better	C or better	C or better
4th St S/4th Ave S	C or better	C or better	C or better
5th St S/11th Ave S	C or better	C or better	C or better
5th St S/Park Ave S	C or better	C or better	C or better

Intersection	Overall Intersection Level of Service		
	No Action	Parking Plan A	Parking Plan B
5th St S/Portland Ave S	C or better	C or better	C or better
5th St S/5th Ave S	D	C or better	C or better
5th St S/4th Ave S	**E**	**E**	D
6th St S/11th Ave S	C or better	C or better	C or better
6th St S/Chicago Ave S	C or better	C or better	C or better
6th St S/Park Ave S	C or better	C or better	C or better
6th St S/Portland Ave S	C or better	C or better	C or better
6th St S/5th Ave S	C or better	C or better	C or better
6th St S/4th Ave S	C or better	C or better	C or better
7th St S/11th Ave S	C or better	C or better	D
7th St S/Chicago Ave S	C or better	C or better	C or better
7th St S/Park Ave S	C or better	D	D
7th St S/Portland Ave S	C or better	C or better	C or better
7th St S/5th Ave S	C or better	C or better	C or better
7th St S/4th Ave S	C or better	C or better	C or better
Total Number of Intersections Operating at Each Level of Service			
Level of Service C or better	29	29	27
Level of Service D	1	1	4
Level of Service E	1	1	0
Level of Service F	0	0	0

Table 3.7-11. Weekday Event Analysis Results – Arrival Peak

Intersection	Overall Intersection Level of Service					
	2017			2030		
	No Action	Parking Plan A	Parking Plan B	No Action	Parking Plan A	Parking Plan B
Washington Ave S/I-35W NB Ramp	**F**	**F**	**F**	**F**	**F**	**F**
Washington Ave S/I-35W SB Ramp	D	**E**	**F**	D	**E**	**F**
Washington Ave S/11th Ave S	**F**	**F**	**F**	**F**	**F**	**F**
Washington Ave S/3rd Ave S	**E**	**E**	**E**	**E**	**E**	**E**
Washington Ave N/3rd Ave N	C or better	D	D	D	D	D
3rd St S/Park Ave S	C or better	C or better	C or better	C or better	C or better	C or better
4th St S/Park Ave S	C or better	C or better	C or better	C or better	C or better	C or better

Intersection	Overall Intersection Level of Service					
	2017			2030		
	No Action	Parking Plan A	Parking Plan B	No Action	Parking Plan A	Parking Plan B
4th St N/2nd Ave N	D	**E**	**F**	D	D	D
5th St S/11th Ave S	**F**	D	**E**	**F**	D	D
6th St S/11th Ave S	**F**	**F**	**F**	**F**	**F**	**F**
6th St S/Chicago Ave S	C or better	D	C or better	C or better	D	C or better
6th St S/Park Ave S	C or better	**E**	**F**	C or better	**E**	**F**
6th St S/Portland Ave S	C or better	C or better	D	C or better	C or better	C or better
6th St N/Hennepin Ave N	D	**E**	**E**	D	D	**E**
6th St N/2nd Ave N	C or better	C or better	C or better	C or better	C or better	C or better
7th St S/11th Ave S	D	**E**	**E**	D	D	D
7th St S/Chicago Ave S	C or better	C or better	C or better	C or better	C or better	C or better
7th St S/Park Ave S	C or better	C or better	C or better	C or better	C or better	C or better
7th St S/5th Ave S	**E**	**E**	**F**	C or better	D	D
Total Number of Intersections Operating at Each Level of Service						
Level of Service C or better	9	6	6	9	6	7
Level of Service D	4	3	2	5	7	5
Level of Service E	2	7	4	1	3	2
Level of Service F	4	3	7	4	3	5

Mitigation Measures

The following summarizes the impacts expected as a result of the Proposed Project and associated road closures and parking facilities, as well as recommended mitigation measures to improve traffic operations.

- Reserved Parking Plan A (North/South Alternate Plaza Configuration)
  - Traffic control officers will be needed at the exits from major parking facilities in order to minimize the queuing and delay of vehicles exiting the parking ramps.
- Reserved Parking Plan B (East/West Alternate Plaza Configuration)
  - The current phasing of the 5th Street/Park Avenue intersection limits the northbound Park Avenue approach to approximately 30 seconds due to the LRT and the resulting unique geometrics and phasing at the intersection. An additional 18 seconds should be added to the northbound split to accommodate the expected increase in northbound traffic on Park Avenue. This change should be incorporated into the event signal timing plan.
  - Traffic control officers will be needed at the exits from major parking facilities, including the proposed parking structure on the McClellan Block, in order to minimize the queuing and delay of vehicles exiting the parking ramps.

- Park Avenue/Portland Avenue Closure
  - The current phasing of the 5th Street/4th Avenue intersection limits the southbound 4th Avenue approach to approximately 30 seconds due to the LRT phasing at the intersection. An additional 20 seconds should be added to the southbound split to accommodate the expected increase in southbound traffic on 4th Avenue. This is not expected to significantly impact the LRT, 5th Street, or pedestrian traffic at the intersection.
  - Additional capacity is needed on 4th Street from Portland Avenue to Park Avenue to accommodate the rerouted Park Avenue and Portland Avenue traffic under Reserved Parking Plan B. An additional 10 seconds should be added to the eastbound split at the 4th Street and Portland Avenue intersection, and an additional seven seconds should be added to the eastbound split at the 4th Street/Park Avenue intersection.
  - The closures of Park Avenue and Portland Avenue should be signed well in advance to give drivers adequate opportunity to choose alternate routes. This would be expected to result in greater dispersion of the rerouted traffic and therefore lesser traffic congestion and impacts. Advance signing would likely be needed on Washington Avenue and 4th Street (for Portland Avenue traffic) and on Park Avenue and 6th Street (for Park Avenue traffic).
- All Proposed Project Event Scenarios
  - Traffic control officers will be needed at additional intersections compared to the No Action conditions, including Park Avenue/3rd Street and 6th Street/10th Avenue where additional parking structures or parking utilization are expected. The determination of locations for traffic control officers should be made during the development of the Traffic Management Plan, which is described in Section 3.7.1.8.
  - The methods for implementing safe and temporary road closures needs to be determined as part of the further development of the Proposed Project design, in conjunction with the City of Minneapolis. During the EIS process, the City identified the need to improve the current operations and management of the roadway closures.
  - During peak event arrival and departure periods, vehicles entering or exiting on-site driveways would likely need to be controlled by Stadium security or traffic control officers to minimize impacts to traffic flow on the adjacent roadways.
  - Event signal timing plans will need to be developed for the arrival and departure periods.
  - Vehicular turning movements at critical intersections will be limited or restricted to increase traffic flow (e.g., the eastbound left-turn movement at the 6th Street/11th Avenue intersection during event departure periods). Drivers will instead be directed to other routes that have available capacity.
  - Consideration will be given to encouraging event patrons with reserved parking to choose their parking location based on ease of arrival/departure. This procedure is expected to reduce traffic volumes at key intersections. For example, the proposed new parking structure on the McGrew Block (Reserved Parking Plan A and Reserved Parking Plan B) has very convenient access to/from I-35W before and after events; however, access to the 511 Building Ramp from I-35W requires a circuitous route with significantly greater travel time due to the road closures and one-way streets, particularly when departing an event.

3.7.1.5 Freeway Network – Event Analysis

A freeway capacity analysis was completed to determine the impacts that event traffic would have on the regional roadway network. The purpose of this analysis is to identify potential problem locations on the regional freeway network due to event traffic. This analysis includes all freeway

segments and ramps directly surrounding the downtown area. The following event scenarios were evaluated:

- Year 2017 No Action Event (Metrodome event of 65,000 seats)
- Year 2017 Proposed Project Event (new Stadium event of 73,000 seats)
- Year 2030 No Action Event (Metrodome event of 65,000 seats)
- Year 2030 Proposed Project Event (new Stadium event of 73,000 seats)

For each event scenario, capacity analysis was completed for three time periods:

- Sunday noon game arrival (10:30-11:30 AM)
- Sunday noon game departure (3:00-4:00 PM)
- Weekday evening game arrival (4:30-5:30 PM)

Assumptions

Existing traffic volumes for a non-event condition were obtained from the Minnesota Department of Transportation's (MnDOT) traffic database from October 2012. To develop 2017 and 2030 non-event volumes, a review of historical traffic volumes was completed. Raw count data and published annual average daily traffic volume (AADTs) for the regional system over the past ten years were obtained from MnDOT's traffic database. The results of this evaluation indicated that no growth has occurred on the freeway system since 2004. For purposes of this analysis, a growth rate of 0.5 percent per year was assumed to account for any potential growth that may occur by year 2030.

A year 2017 No Action event is expected to generate 17,255 vehicles, and a year 2017 Proposed Project event is expected to generate 19,305 vehicles. By year 2030, the amount of vehicles generated by an event will reduce to 11,946 vehicles (No Action) and 13,996 vehicles (Build) due to the availability of the future Southwest and Bottineau LRT lines. The arrival peak hour will account for 50 percent of all event vehicles and the departure peak hour will account for 70 percent of all event vehicles. The event vehicles were assigned to the regional system using the directional distribution shown in **Figure 3.7-1**. The sum of the background and event traffic was calculated for each segment/ramp and used to determine the anticipated hourly traffic volumes for each event scenario.

The following planning level capacity thresholds were selected to determine if a segment or ramp is approaching or over capacity. The volume thresholds are based on vehicles per lane per hour (vplph).

- Freeway Lane Capacity 2,000 vplph (1,800 to 2,000 is approaching capacity)
- Ramp Capacity 1,600 vplph (1,440 to 1,600 is approaching capacity)

The use of the existing MnPASS lanes on I-394 and the Priced Dynamic Shoulder Lane (PDSL) on northbound I-35W south of downtown Minneapolis were assumed to be available during the arrival and departure periods. However, during the weekday arrival period, the reversible MnPASS lanes on I-394 will be running in the westbound direction to accommodate the afternoon commute and therefore will not be available for event motorists traveling eastbound towards downtown.

It should be noted that the total volume for each location assumes that all the traffic can get to that location during the hour (i.e., there are no bottlenecks upstream). Also, this analysis does not take into account any diversion to the background traffic that may occur during an event.

2017 No Action Event

The 2017 No Action Event scenario was evaluated for a Sunday noon game arrival (10:30-11:30 AM), Sunday noon game departure (3:00-4:00 PM) and a weekday evening game arrival (4:30-5:30

PM). The results of the analysis shown below in **Table 3.7-12** identify locations that are expected to be approaching or over capacity. During a 2017 Sunday noon game arrival, all freeway segments and ramps will operate under capacity. However, during the Sunday noon game departure and weekday evening game arrival, several locations have been identified to be approaching or over capacity. The location numbers listed correspond with those illustrated in **Figure 3.7-10**.

Table 3.7-12. 2017 No Action Event Freeway Analysis – Capacity Results

Location*	Number of Lanes	Capacity (vph†)	Traffic Volumes (vph)		
			Background	Event	Total
Sunday Arrival					
N/A	N/A	N/A	N/A	N/A	N/A
Sunday Departure					
1. Washington Ave S ramp to Northbound I-35W	1	1,600	500	1,200	1,700 (over)
2. 6th St S ramp to Eastbound I-94	1	1,600	375	1,275	1,650 (over)
3. TH 65 ramps from downtown to Southbound I-35W	2	3,200	475	2,550	3,025 (approaching)
4. Southbound I-35W at Lake St	4	8,000	5,475	2,550	8,025 (over)
5. 3rd St N ramp to Westbound I-94	1	2,000	450	1,450	1,900 (approaching)
Weekday Evening Arrival					
6. Southbound I-35W at University Ave	3	6,000	4,900	875	5,775 (approaching)
7. Southbound I-35W Ramp to Washington Ave S	1	1,600	1,025	600	1,625 (over)
8. Eastbound I-394 at Dunwoody Blvd	3	6,000	4,275	1,625	5,900 (approaching)

*Location numbers correspond to locations noted in **Figure 3.7-10**.
† Vehicles per hour

2017 Proposed Project Event

The 2017 Proposed Project Event scenario was evaluated for a Sunday noon game arrival (10:30-11:30 AM), Sunday noon game departure (3:00-4:00 PM), and a weekday evening game arrival (4:30-5:30 PM). The results of the analysis shown below in **Table 3.7-13** identify locations that are expected to be approaching or over capacity. During a 2017 Sunday noon game arrival, all freeway segments and ramps will operate under capacity similar to the No Action Event scenario. However, during the Sunday noon game departure and weekday evening game arrival, several locations have been identified to be approaching or over capacity. These locations are similar to those identified in the 2017 No Action Event scenario. However, the additional trips under the Proposed Project scenario add congestion to these locations, and one new location has been identified as approaching capacity (northbound I-35W at Lake Street). The location numbers listed correspond with those illustrated in **Figure 3.7-11**.

Table 3.7-13. 2017 Proposed Project Event Freeway Analysis – Capacity Results

Location*	Number of Lanes	Capacity (vph)	Traffic Volumes (vph)		
			Background	Event	Total
Sunday Arrival					
N/A	N/A	N/A	N/A	N/A	N/A
Sunday Departure					
1. Washington Ave ramp to Northbound I-35W	1	1,600	500	1,350	1,850 (over)
2. 6th St S ramp to Eastbound I-94	1	1,600	375	1,425	1,800 (over)
3. TH 65 ramps from downtown to Southbound I-35W	2	3,200	475	2,850	3,325 (over)
4. Southbound I-35W at Lake St	4	8,000	5,475	2,850	8,325 (over)
5. 3rd St N ramp to Westbound I-94	1	2,000	450	1,625	2,075 (over)
Weekday Evening Arrival					
6. Southbound I-35W at University Ave	3	6,000	4,900	975	5,875 (approaching)
7. Southbound I-35W Ramp to Washington Ave S	1	1,600	1,025	675	1,700 (over)
8. Eastbound I-394 at Dunwoody Blvd	3	6,000	4,275	1,825	6,100 (approaching)
9. Northbound I-35W at Lake Street	5†	9,500	6,525	2,025	8,550 (approaching)

*Location numbers correspond to locations noted in **Figure 3.7-11**.
†Assumes the priced dynamic shoulder lane (PDSL) has a capacity of 1,500 vph.

2030 No Action Event

The 2030 No Action Event scenario was evaluated for a Sunday noon game arrival (10:30-11:30 AM), Sunday noon game departure (3:00-4:00 PM), and a weekday evening game arrival (4:30-5:30 PM). The results of the analysis shown below in **Table 3.7-14** identify locations that are expected to be approaching or over capacity. During a 2030 Sunday noon game arrival, all freeway segments and ramps will operate under capacity similar to the 2017 No Action Event scenario. It is important to note that several locations that were identified as approaching or being over capacity under the 2017 No Action Event scenario are not expected to be an issue by 2030 due to the reduction in event vehicles due to the availability of the future Southwest and Bottineau LRT lines. This improvement in operations is because the reduction in event trips is greater than the increase in background traffic from 2017 to 2030. The location numbers listed correspond with those illustrated in **Figure 3.7-12**.

Table 3.7-14. 2030 No Action Event Freeway Analysis – Capacity Results

Location*	Number of Lanes	Capacity (vph)	Traffic Volumes (vph)		
			Background	Event	Total
Sunday Arrival					
N/A	N/A	N/A	N/A	N/A	N/A
Sunday Departure					
4. Southbound I-35W at Lake St	4	8,000	5,850	1,750	7,600 (approaching)
Weekday Evening Arrival					
6. Southbound I-35W at University Ave	3	6,000	5,225	600	5,825 (approaching)
7. Southbound I-35W Ramp to Washington Ave S	1	1,600	1,075	425	1,500 (approaching)
8. Eastbound I-394 at Dunwoody Blvd	3	6,000	4,550	1,150	5,700 (approaching)

*Location numbers correspond to locations noted in **Figure 3.7-12**.

2030 Proposed Project Event

The 2030 Proposed Project Event scenario was evaluated for a Sunday noon game arrival (10:30-11:30 AM), Sunday noon game departure (3:00-4:00 PM), and a weekday evening game arrival (4:30-5:30 PM). The results of the analysis shown below in **Table 3.7-15** identify locations that are expected to be approaching or over capacity. During a 2030 Sunday noon game arrival, all freeway segments and ramps will operate under capacity similar to the 2030 No Action Event scenario. For the Sunday noon game departure and weekday evening game arrival, the 2030 Proposed Project Event scenario is expected to have similar congestion locations as the 2030 No Action Event scenario. However, the additional trips under the Proposed Project scenario add congestion to these locations and create one new location during the Sunday departure period (Washington Avenue ramp to northbound I-35W). The location numbers listed correspond with those illustrated in **Figure 3.7-13**.

Table 3.7-15. 2030 Proposed Project Event Freeway Analysis – Capacity Results

Location*	Number of Lanes	Capacity (vph)	Traffic Volumes (vph)		
			Background	Event	Total
Sunday Arrival					
N/A	N/A	N/A	N/A	N/A	N/A
Sunday Departure					
1. Washington Ave S ramp to Northbound I-35W	1	1,600	550	975	1,525 (approaching)
4. Southbound I-35W at Lake St	4	8,000	5,850	2,050	7,900 (approaching)
Weekday Evening Arrival					
6. Southbound I-35W at University Ave	3	6,000	5,225	700	5,925 (approaching)

Location*	Number of Lanes	Capacity (vph)	Traffic Volumes (vph)		
			Background	Event	Total
7. Southbound I-35W Ramp to Washington Ave S	1	1,600	1,075	500	1,575 (approaching)
8. Eastbound I-394 at Dunwoody Blvd	3	6,000	4,550	1,325	5,875 (approaching)

*Location numbers correspond to locations noted in **Figure 3.7-13**.

3.7.1.6 Dual Event Scenario

Consideration was given to scenarios with a capacity event at the new Stadium and a coincident capacity event at Target Field. This type of scenario could occur at most a few times a year in late August, September, or October when the NFL and Major League Baseball seasons overlap. The proximity of the start and end times of each event will have an influence on the degree of increased traffic and congestion that may occur downtown under such a scenario. On average, vehicles would be expected to experience increased delay within the study area, and an increased number of intersections within and outside of the study area would be expected to experience poor operations. In addition, the time required for the congestion to clear after the end of either or both events would be expected to be extended and additional traffic control officers would likely be needed. Promoting early arrivals and later departures to all event attendees, as well as carpooling, will also be important measures.

3.7.1.7 Non-NFL Events

The Metrodome is currently host to hundreds of non-NFL events and activities each year such as college baseball games, running and rollerblading in the Metrodome concourses during winter months, and high school football games. The new Stadium is planned to have similar uses throughout the year. The event calendar for 2012 and 2013 was reviewed to identify how many events would potentially generate a significant number of attendees, and therefore potential traffic impacts. Events anticipated to draw more than 5,000 attendees were identified, as this level of event would be expected to generate more than 1,000 vehicles. The time when these events occur was also identified, as many of them occur on weekends when background traffic volumes are low. **Table 3.7-16** identifies the non-NFL events expected at the new Stadium, the timeframe when they typically occur, and the expected number of attendees.

Table 3.7-16. Stadium Non-NFL Events

Event	Time of Year	Time of Week	Anticipated Number of Attendees
Motorsport Events (Monster Truck Rally, Motocross, etc)	Any	Saturday evening	Up to 65,000
Hmong New Year	November	Saturday-Sunday	5,000+
Home and Landscape Expo	January	Friday afternoon-Sunday	5,000+
TwinsFest	January	Friday afternoon-Sunday	25,000+ (over 3 days)
Vikings Draft Party	April	Thursday evening	10,000+
Minnesota State High School League Prep Bowl	November	Friday-Saturday	25,000+ (over 2 days)
Concert	Any	Any evening	Near capacity

As shown, there are only a few non-NFL events expected to occur per year that have attendance that may have a traffic impact. Less than five of these events have the potential to overlap with the weekday peak hour.

Although not a current use at the Metrodome, the Vikings have the option to bring a Major League Soccer (MLS) team to the new Stadium. There are currently 19 MLS teams, and the season consists of 34 regular season games. The average attendance for MLS games in 2012 was approximately 19,000 people. MLS games occur throughout the week, and the arrival period for an MLS game would likely partially overlap with the PM peak hour. However, the attendance levels are less than for a capacity NFL event, the arrival period would be expected to occur later since there would not be expected to be tailgating or other major pre-game activities, and temporary road closures around the new Stadium would not be anticipated. Therefore, the traffic impact of these types of events would be less than the analysis presented for a capacity NFL event. However, the Traffic Management Plan for the Proposed Project should include transportation management strategies for these types of mid-level events as some of them may necessitate traffic control officers, signal timing adjustments, or other measures to manage event traffic.

3.7.1.8 Traffic Mitigation Strategies

From the traffic modeling and transportation analysis, potential mitigation measures have been developed to improve the flow of vehicular traffic around the new Stadium. In addition to the specific traffic mitigation measures discussed in Sections 3.7.1.3 and 3.7.1.4, which are listed again below for reference, more generalized traffic management strategies have also been identified. These mitigation measures will be further reviewed during the design process to determine their effectiveness.

Specific Mitigation Strategies

The following potential mitigation measures for the closure of 5th Street were identified based on the non-event traffic analysis of the local roadway network:

- Option 1
  - The current phasing of the 5th Street/Park Avenue intersection limits the northbound Park Avenue approach to approximately 30 seconds due to the LRT and the resulting unique geometrics and phasing at the intersection. An additional five seconds should be added to the northbound split to accommodate the expected increase in northbound traffic on Park Avenue. This is not expected to significantly impact the LRT, 5th Street, or pedestrian traffic at the intersection.
  - Additional capacity is needed on 11th Avenue from 5th Street to 7th Street to accommodate the rerouted 5th Street traffic. This will require restriping of the existing roadway section, including the existing bike lane, and removal of the existing metered on-street parking between 5th Street and 7th Street. The additional lane would end as a right-turn only lane at 7th Street.
  - Capacity improvements were analyzed at the Washington Avenue/11th Avenue intersection to better accommodate the increased northbound left-turn traffic. These improvements included adding a second northbound left-turn lane or modifying the signal phasing to split phased for northbound/southbound. While these changes increased the capacity of the northbound movements, they had significant negative operational impacts on the southbound 11th Avenue movements and on the overall intersection delay. Therefore, capacity improvements are not recommended at the Washington Avenue/11th Avenue intersection.

  - Modifications to the existing traffic signals at 5th Street/11th Avenue and 5th Street/Chicago Avenue will be needed to accommodate the changed intersection geometrics and traffic flow as a result of the 5th Street closure.

- Option 2
  - Additional capacity is needed on 11th Avenue from 5th Street to 6th Street to accommodate the rerouted 5th Street traffic. This would require restriping of the existing roadway section, including the existing bike lane. The additional lane would end as a right-turn only lane at 6th Street.
  - Existing metered parking spaces on 6th Street will need to be removed from 11th Avenue to Chicago Avenue or Park Avenue to accommodate the westbound contraflow lane. This would require restriping of the existing roadway and consideration to the appropriate location for the bike lane within the roadway section.
  - Modifications to the existing traffic signals at 5th Street/11th Avenue, 6th Street/Chicago Avenue, 6th Street/Park Avenue (if contra-flow lane extended to Park Avenue), and 5th Street/Chicago Avenue to accommodate the changed geometrics and traffic flow as a result of the 5th Street closure.

The following potential mitigation measures were identified for a capacity event at the new Stadium based on the event traffic analysis of the local roadway network:

- Reserved Parking Plan A (North/South Alternate Plaza Configuration)
  - Traffic control officers will be needed at the exits from major parking facilities in order to minimize the queuing and delay of vehicles exiting the parking ramps.
- Reserved Parking Plan B (East/West Alternate Plaza Configuration)
  - The current phasing of the 5th Street/Park Avenue intersection limits the northbound Park Avenue approach to approximately 30 seconds due to the LRT and the resulting unique geometrics and phasing at the intersection. An additional 18 seconds should be added to the northbound split to accommodate the expected increase in northbound traffic on Park Avenue. This change should be incorporated into the event signal timing plan.
  - Traffic control officers will be needed at the exits from major parking facilities, including the proposed parking structure on the McClellan Block, in order to minimize the queuing and delay of vehicles exiting the parking ramps.
- Park Avenue/Portland Avenue Closure
  - The current phasing of the 5th Street/4th Avenue intersection limits the southbound 4th Avenue approach to approximately 30 seconds due to the LRT phasing at the intersection. An additional 20 seconds should be added to the southbound split to accommodate the expected increase in southbound traffic on 4th Avenue. This is not expected to significantly impact the LRT, 5th Street, or pedestrian traffic at the intersection.
  - Additional capacity is needed on 4th Street from Portland Avenue to Park Avenue to accommodate the rerouted Park Avenue and Portland Avenue traffic under Reserved Parking Plan B. An additional 10 seconds should be added to the eastbound split at the 4th Street and Portland Avenue intersection, and an additional seven seconds should be added to the eastbound split at the 4th Street/Park Avenue intersection.
  - The closures of Park Avenue and Portland Avenue should be signed well in advance to give drivers adequate opportunity to choose alternate routes. This would be expected to result in greater dispersion of the rerouted traffic and therefore lesser traffic congestion and impacts.

Advance signing would likely be needed on Washington Avenue and 4th Street (for Portland Avenue traffic) and on Park Avenue and 6th Street (for Park Avenue traffic).

- All Proposed Project Event Scenarios
  - Traffic control officers will be needed at additional intersections compared to the No Action conditions, including Park Avenue/3rd Street and 6th Street/10th Avenue where additional parking structures or parking utilization are expected. The determination of locations for traffic control officers should be made during the development of the Traffic Management Plan, which is described in Section 3.7.1.8.
  - The methods for implementing safe and temporary road closures needs to be determined as part of the further development of the Proposed Project design, in conjunction with the City of Minneapolis. During the EIS process, the City identified the need to improve the current operations and management of the roadway closures.
  - Event signal timing plans will need to be developed for the arrival and departure time periods.
  - Vehicular turning movements at critical intersections should be limited or restricted to increase traffic flow (e.g., the eastbound left-turn movement at the 6th Street/11th Avenue intersection during event departure periods). Drivers should instead be directed to other routes that have available capacity.
  - Consideration should be given to encouraging event patrons with reserved parking to choose their parking location based on ease of arrival/departure. For example, the proposed new parking structure on the McGrew Block (Reserved Parking Plan A and Reserved Parking Plan B) has very convenient access to/from I-35W before and after events; however, access to the 511 Building Ramp from I-35W results in significantly more travel time and congestion for the event patron, particularly when departing an event.

General Mitigation and Management Strategies

The following are general mitigation measures and management strategies. They overlap a variety of transportation elements, some of which are also discussed in other sections of this chapter.

- Visitor Information

  Providing information to the public and event attendees regarding events at the new Stadium and adjacent facilities is an important mitigation measure. Event information could include event schedules, parking locations, directions to parking based on origin, transit connections, transit routes and schedules, directions for pedestrians, and links to other adjacent venues. The information could be provided via a website, email, with ticket purchase, mailings, and general media. The downtown Minneapolis Transportation Management Organization (TMO) could also be used as a communication mechanism to disseminate this information.

- Wayfinding for Vehicles, Bicyclists, and Pedestrians

  Wayfinding should be provided for vehicles to locate available parking spaces and for pedestrians to locate the new Stadium both at street level and in the skyways. Consideration should be given to changeable message signs or other wayfinding signing such as Variable Message Signs (VMS)/Parking Information Systems to direct parkers to available parking. These signs could be located on roadways used by event traffic.

  To assist with wayfinding, the MSFA website could have a link to Metro Transit's trip planning feature. The website should also have links to City of Minneapolis and MnDOT travel planning tools.

The stadium public address (PA) system and scoreboard could be used to provide an additional opportunity to communicate public transportation options and traffic conditions at the end of a game.

At each parking location, locator cards should be distributed to event patrons to assist with finding the parking facility. Clear and easy-to-read signage should be installed to direct event attendees to use desirable routes in and out of the new Stadium and to/from parking and transit facilities.

Loading zones should be provided for patrons requiring disability access. These access points should be as close to the new Stadium entrances as possible.

- Traffic Management Plan

  A Traffic Management Plan should be prepared by a committee consisting of members from the City of Minneapolis, Hennepin County, Metro Transit, MSFA, local business groups, and nearby residents. The Traffic Management Committee would discuss and review in detail such issues as potential changeable message signs, static sign locations and messages, locations of traffic control officers before and after events, event signal timing plans, and event traffic control plans. The Traffic Management Plan should be developed with the understanding that updates and changes will be needed based on actual event experience and maintained on a regular basis. The plan should cover various event scenarios including a capacity stadium event, a capacity stadium event combined with a capacity event at Target Field, and large non-NFL events.

3.7.2 Parking Analysis

A parking analysis was completed to determine where Stadium attendees would likely park for an event. Four event scenarios were analyzed:

- Year 2017 No Action Sunday Noon Event (existing capacity event of 65,000 attendees)
- Year 2017 No Action Weekday Evening Event
- Year 2017 Proposed Project Sunday Noon Event (proposed capacity event of 73,000 attendees)
- Year 2017 Proposed Project Weekday Evening Event

A year 2017 No Action event is expected to generate 17,255 vehicles, and a year 2017 Proposed Project Event is expected to generate 19,305 vehicles. This parking analysis will identify likely locations to accommodate the No Action and Proposed Project vehicle estimates. Year 2030 parking analysis was not performed since the parking demand for No Action and Proposed Project events will decrease by approximately 25 to 30 percent due to the availability of the future Southwest and Bottineau LRT corridors.

Two parking plan scenarios were analyzed under Proposed Project conditions: Reserved Parking Plan A and Plan B. Each plan identifies 2,500 reserved parking spaces in the area immediately adjacent to the new Stadium. Plan A results in a net increase of approximately 600 parking spaces and Plan B provides a net increase of approximately 1,100 parking spaces. These increases are a result of replacing existing surface lots with new parking ramps. Details of each parking plan are identified in Section 3.7.1.4.

Use data was gathered for eight downtown ramps to determine usage trends during different time periods and in different locations throughout downtown. In addition, use data was also gathered for on-street parking areas within ½ mile of the new Stadium. This parking utilization data was collected during:

- Thursday, October 18, 2012 (Thursday, no event)
- Thursday, October 25, 2012 (Thursday, event)

- Sunday, November 4, 2012 (Sunday, no event)
- Sunday, November 11, 2012 (Sunday, event)

3.7.2.1 Parking Locations

Study area boundaries for the analysis were created and parking analysis zones were formed within the study area. These zones were identified as parking areas most likely utilized for Stadium events. It is understood that patrons do utilize existing parking locations on the University of Minnesota's West Bank Campus during events. However, these locations were not accounted for in the parking analysis. The following is a description of each study zone. The boundaries of each zone are illustrated in **Figure 3.7-14**.

Stadium Parking (within ¼ mile walk to Stadium)

This area includes most of the parking within a ¼ mile walk of the new Stadium. The area is defined by 5th Avenue to the west, Washington Avenue to the north, I-35W to the east, and 10th Street/14th Street to the south. This area contains approximately 8,850 parking spaces, including parking ramps and private lots. Of these 8,850 spaces, approximately 85 percent are available for a Sunday noon event and approximately 80 percent are available for a weekday evening event. Currently, this area is heavily utilized during events and is expected to remain so under future No Action and Proposed Project conditions. In addition, this parking area contains approximately 1,200 on-street parking spaces. A portion of these will be used by patrons, but they are not included in the parking utilization calculations.

North of Washington Avenue Parking (approximately ¼ mile walk to Stadium)

This area contains all parking north of Washington Avenue between 5th Avenue and I-35W. This area contains approximately 1,550 parking spaces, including parking ramps and private lots. Of these 1,550 spaces, approximately 85 percent are available for a Sunday noon event and approximately 71 percent are available for a weekday evening event. Currently, this area is under-utilized during events, with only 40 to 50 percent of available parking spaces being utilized during events. In addition, this parking area contains approximately 430 on-street parking spaces. A portion of these will be used by patrons, but they are not included in the parking utilization calculations.

2nd Avenue to 5th Avenue Parking (approximately ¼ to ½ mile walk to Stadium)

This area contains all parking between 2nd Avenue and 5th Avenue from 10th Street to 1st Street. This area contains approximately 10,550 parking spaces, including parking ramps and private lots. Of these 10,550 spaces, approximately 90 percent are available for a Sunday noon event and approximately 85 percent are available for a weekday evening event. Current data indicates that this area is utilized during events. In addition, this parking area contains approximately 450 on-street parking spaces. A portion of these will be used by patrons, but they are not included in the parking utilization calculations.

West of 2nd Avenue Parking (over ½ mile walk to Stadium)

This area contains all of the parking ramps parking between Hennepin Avenue and 2nd Avenue from 10th Street to 3rd Street. This area also takes into account parking ramps A, B, and C. This area contains approximately 17,200 parking spaces, only including parking ramps. Of these 17,200 spaces, approximately 66 percent are available for a Sunday noon event and approximately 61 percent are available for a weekday evening event. Current data indicates that this area is slightly used during stadium events. This area was identified to account for any vehicles that cannot be accommodated in the previously defined parking areas east of 2nd Avenue.

Parking Capacity and Use

Within the study area, there are approximately 38,000 parking spaces. Of these, approximately 29,700 spaces (78 percent) are available for a Sunday noon event and approximately 27,700 (73 percent) are available for a weekday evening event. These totals will accommodate the projected needs for a 2017 Proposed Project event (19,305).

Tables 3.7-17 through **3.7-23** identify capacity and anticipated use for the 2017 No Action and Proposed Project Reserved Parking Plan A and Plan B events. These tables identify total capacity and the amount of available parking spaces for an event along with how many of the available spaces will be utilized during an event. These values were estimated using existing parking ramp utilization data. It is important to note that the 2030 parking analysis was not performed since the parking demand for No Action and Proposed Project events will decrease due to the availability of the future Southwest and Bottineau LRT lines.

Table 3.7-17. Current Parking Use and Availability

Parking Location	Capacity (parking stalls)	Sunday Noon Event		Weekday Evening Event	
		Percent Available	Stalls Available	Percent Available	Stalls Available
Stadium Parking					
Ramps	2,400	90%	2,160	85%	2,040
Hennepin Medical Center Ramp	1,192	50%	596	50%	596
Private Lots	5,257	90%	4,731	85%	4,469
Subtotal	*8,849*	*85%*	*7,487*	*80%*	*7,105*
North of Washington Avenue Parking					
Ramps	1,484	85%	1,261	70%	1,039
Private Lots	76	90%	68	80%	61
Subtotal	*1,560*	*85%*	*1,329*	*71%*	*1,100*
2nd Avenue to 5th Avenue Parking					
Ramps	9,406	90%	8,465	85%	7,995
Private Lots	1,159	90%	1,043	85%	985
Subtotal	*10,565*	*90%*	*9,508*	*85%*	*8,980*
West of 2nd Avenue Parking					
Ramp A	3,020	98%	2,960	87%	2,627
Ramp B	1,606	97%	1,558	82%	1,317
Ramp C	1,400	92%	1,288	70%	980
Other Ramps†	11,155	50%	5,577	50%	5,577
Subtotal	*17,181*	*66%*	*11,383*	*61%*	*10,501*
TOTAL	**38,155**	**78%**	**29,707**	**73%**	**27,686**

***** Based on 12:00 PM data for Sunday and 6:00 PM data for weekday.
† Includes parking ramps between Hennepin Avenue and 2nd Avenue S.

Table 3.7-18. Estimated Parking Use and Availability 2017 Sunday No Action Event

Parking Location	Capacity (parking stalls)	Percent Available	Stalls Available	Percent Used for Games	Used Supply (stalls)
Stadium Parking					
Ramps	2,400	90%	2,160	94%	2,040
Hennepin Medical Center Ramp	1,192	50%	596	90%	536
Private Lots	5,257	90%	4,731	100%	4,731
Subtotal	*8,849*	*85%*	*7,487*	*98%*	*7,307*
North of Washington Avenue Parking					
Ramps	1,484	85%	1,261	43%	547
Private Lots	76	90%	68	43%	29
Subtotal	*1,560*	*85%*	*1,329*	*43%*	*576*
2nd Avenue to 5th Avenue Parking					
Ramps	9,406	90%	8,465	94%	7,145
Private Lots	1,159	90%	1,043	100%	880
Subtotal	*10,565*	*90%*	*9,508*	*95%*	*9,038*
West of 2nd Avenue Parking					
Ramp A	3,020	98%	2,960	2%	59
Ramp B	1,606	97%	1,558	10%	148
Ramp C	1,400	92%	1,288	7%	84
Other Ramps†	11,155	50%	5,577	1%	43
Subtotal	*17,181*	*66%*	*11,383*	*3%*	*334*
TOTAL	**38,155**	**78%**	**29,707**	**58%**	**17,255**

* Includes parking ramps between Hennepin Avenue and 2nd Avenue S.

Table 3.7-19. Estimated Parking Use and Availability 2017 Sunday Proposed Project Event – Reserved Parking Plan A

Parking Location	Capacity (parking stalls)	Percent Available	Stalls Available	Percent Used for Games	Used Supply (stalls)
Stadium Parking					
Ramps	3,600	90%	3,240	94%	3,060
Hennepin Medical Center Ramp	1,192	50%	596	90%	536
Private Lots	4,672	90%	4,205	100%	4,205
Subtotal	*9,464*	*85%*	*8,041*	*97%*	*7,801*
North of Washington Avenue Parking					
Ramps	1,484	85%	1,261	47%	598
Private Lots	76	90%	68	47%	32
Subtotal	*1,560*	*85%*	*1,329*	*47%*	*630*
2nd Avenue to 5th Avenue Parking					
Ramps	9,406	90%	8,465	94%	7,995
Private Lots	1,159	90%	1,043	100%	1,043
Subtotal	*10,565*	*90%*	*9,508*	*95%*	*9,038*

Parking Location	Capacity (parking stalls)	Percent Available	Stalls Available	Percent Used for Games	Used Supply (stalls)
West of 2nd Avenue Parking					
Ramp A	3,020	98%	2,960	11%	339
Ramp B	1,606	97%	1,558	55%	853
Ramp C	1,400	92%	1,288	38%	484
Other Ramps†	11,155	50%	5,577	3%	160
Subtotal	*17,181*	*66%*	*11,383*	*16%*	*1,836*
TOTAL	**38,770**	**78%**	**30,261**	**64%**	**19,305**

* Includes parking ramps between Hennepin Avenue and 2nd Avenue S.

Table 3.7-20. Estimated Parking Use and Availability 2017 Sunday Proposed Project Event – Reserved Parking Plan B

Parking Location	Capacity (parking stalls)	Percent Available	Stalls Available	Percent Used for Games	Used Supply (stalls)
Stadium Parking					
Ramps	4,090	90%	3,681	94%	3,477
Hennepin Medical Center Ramp	1,192	50%	596	90%	536
Private Lots	4,663	90%	4,197	100%	4,197
Subtotal	*9,945*	*85%*	*8,474*	*97%*	*8,210*
North of Washington Avenue Parking					
Ramps	1,484	85%	1,261	47%	598
Private Lots	76	90%	68	47%	32
Subtotal	*1,560*	*85%*	*1,329*	*47%*	*630*
2nd Avenue to 5th Avenue Parking					
Ramps	9,406	90%	8,465	94%	7,995
Private Lots	1,159	90%	1,043	100%	1,043
Subtotal	*10,565*	*90%*	*9,508*	*95%*	*9,038*
West of 2nd Avenue Parking					
Ramp A	3,020	98%	2,960	9%	265
Ramp B	1,606	97%	1,558	43%	664
Ramp C	1,400	92%	1,288	29%	376
Other Ramps†	11,155	50%	5,577	2%	122
Subtotal	*17,181*	*66%*	*11,383*	*13%*	*1,427*
TOTAL	**39,251**	**78%**	**30,694**	**63%**	**19,305**

* Includes parking ramps between Hennepin Avenue and 2nd Avenue S.

Table 3.7-21. Estimated Parking Use and Availability 2017 Weekday Evening No Action Event

Parking Location	Capacity (parking stalls)	Percent Available	Stalls Available	Percent Used for Games	Used Supply (stalls)
Stadium Parking					
Ramps	2,400	85%	2,040	94%	1,920
Hennepin Medical Center Ramp	1,192	50%	596	90%	536
Private Lots	5,257	85%	4,469	100%	4,469
Subtotal	*8,849*	*80%*	*7,105*	*97%*	*6,925*
North of Washington Avenue Parking					
Ramps	1,484	70%	1,039	40%	412
Private Lots	76	80%	61	41%	25
Subtotal	*1,560*	*71%*	*1,100*	*40%*	*437*
2nd Avenue to 5th Avenue Parking					
Ramps	9,406	85%	7,995	89%	7,097
Private Lots	1,159	85%	985	100%	985
Subtotal	*10,565*	*85%*	*8,980*	*95%*	*8,510*
West of 2nd Avenue Parking					
Ramp A	3,020	87%	2,627	2%	65
Ramp B	1,606	82%	1,317	33%	433
Ramp C	1,400	70%	980	19%	187
Other Ramps†	11,155	50%	5,577	13%	698
Subtotal	*17,181*	*61%*	*10,501*	*13%*	*1,383*
TOTAL	**38,155**	**73%**	**27,686**	**62%**	**17,255**

* Includes parking ramps between Hennepin Avenue and 2nd Avenue S.

Table 3.7-22. Estimated Parking Use and Availability 2017 Weekday Evening Proposed Project Event – Reserved Parking Plan A

Parking Location	Capacity (parking stalls)	Percent Available	Stalls Available	Percent Used for Games	Used Supply (stalls)
Stadium Parking					
Ramps	3,600	85%	3,060	94%	2,880
Hennepin Medical Center Ramp	1,192	50%	596	90%	536
Private Lots	4,672	85%	3,971	100%	3,971
Subtotal	*9,464*	*81%*	*7,627*	*97%*	*7,387*
North of Washington Avenue Parking					
Ramps	1,484	70%	1,039	44%	453
Private Lots	76	80%	61	44%	27
Subtotal	*1,560*	*71%*	*1,100*	*44%*	*480*
2nd Avenue to 5th Avenue Parking					
Ramps	9,406	85%	7,995	94%	7,525
Private Lots	1,159	85%	985	100%	985
Subtotal	*10,565*	*85%*	*8,980*	*95%*	*8,510*

Parking Location	Capacity (parking stalls)	Percent Available	Stalls Available	Percent Used for Games	Used Supply (stalls)
West of 2nd Avenue Parking					
Ramp A	3,020	87%	2,627	5%	138
Ramp B	1,606	82%	1,317	70%	917
Ramp C	1,400	70%	980	41%	396
Other Ramps†	11,155	50%	5,577	26%	1,477
Subtotal	*17,181*	*61%*	*10,501*	*28%*	*2,928*
TOTAL	**38,770**	**73%**	**28,208**	**68%**	**19,305**

* Includes parking ramps between Hennepin Avenue and 2nd Avenue S.

Table 3.7-23. Estimated Parking Use and Availability 2017 Weekday Evening Proposed Project Event – Reserved Parking Plan B

Parking Location	Capacity (parking stalls)	Percent Available	Stalls Available	Percent Used for Games	Used Supply (stalls)
Stadium Parking					
Ramps	4,090	85%	3,477	94%	3,273
Hennepin Medical Center Ramp	1,192	50%	596	90%	536
Private Lots	4,663	85%	3,964	100%	3,964
Subtotal	*9,945*	*81%*	*8,037*	*97%*	*7,773*
North of Washington Avenue Parking					
Ramps	1,484	70%	1,039	44%	453
Private Lots	76	80%	61	44%	27
Subtotal	*1,560*	*71%*	*1,100*	*44%*	*480*
2nd Avenue to 5th Avenue Parking					
Ramps	9,406	85%	7,995	94%	7,525
Private Lots	1,159	85%	985	100%	985
Subtotal	*10,565*	*85%*	*8,980*	*95%*	*8,510*
West of 2nd Avenue Parking					
Ramp A	3,020	87%	2,627	5%	119
Ramp B	1,606	82%	1,317	60%	796
Ramp C	1,400	70%	980	35%	344
Other Ramps†	11,155	50%	5,577	23%	1,283
Subtotal	*17,181*	*61%*	*10,501*	*24%*	*2,542*
TOTAL	**39,251**	**73%**	**28,618**	**67%**	**19,305**

* Includes parking ramps between Hennepin Avenue and 2nd Avenue S.

Results

Results of the parking analysis indicate that:

- Under 2017 Proposed Project Event conditions, approximately 2,050 additional vehicles are generated when compared to 2017 No Action Event conditions.
- Reserved Parking Plan A results in a net increase of approximately 600 parking stalls when compared to No Action conditions.
- Reserved Parking Plan B results in a net increase of approximately 1,100 parking stalls when compared to No Action conditions.

- Approximately 98 percent of event vehicles can be accommodated in areas east of 2nd Avenue during a 2017 Weekend No Action event. During a 2017 Weekend Proposed Project event, this value is reduced to approximately 90 to 93 percent. These reductions indicate that a majority of the additional traffic will need to utilize parking west of 2nd Avenue.
- Approximately 92 percent of event vehicles can be accommodated in areas east of 2nd Avenue during a 2017 Weekday No Action event. During a 2017 Weekday Proposed Project event, this value is reduced to approximately 85 to 87 percent. These reductions indicate that a majority of the additional traffic will need to utilize parking west of 2nd Avenue.
- Parking north of Washington Avenue is underutilized during current Sunday and weekday events. This may be due to the current operations of Washington Avenue during the departure period when motorists experience significant congestion.

3.7.2.2 Dual Event Scenario

The potential of having a new Stadium and Target Field event at the same time was considered. The results of this parking analysis and the parking analysis results identified in the Minnesota Twins Urban Ballpark EIS Study (June 2007) indicate that each event would have conflicting parking needs in the central area of downtown Minneapolis. If a "dual event" were to occur, parking areas near the Minneapolis Convention Center and in St. Anthony Main will be needed to accommodate the parking demand for both events.

3.7.2.3 Parking Mitigation Strategies

Some of the main areas of congestion during event departures are anticipated to be the egress points from parking structures. Another concern is the availability of event attendees to find available parking, since vehicles circulating on local roadways adds to pre-event traffic and potential congestion. The following strategies may be considered to address event parking impacts.

- Maximize exiting flow rate from existing and new parking ramps by providing reversible entrance and exit lanes.
- Promote earlier arrival and later departure by event attendees.
- Promote carpooling through discounted parking prices or preferential parking location.
- Promote the use of parking facilities throughout downtown, especially those with nearby transit service to or near the new Stadium.
- Promote the use of transit by providing an event ticket and transit fare package.
- Transit route information should be made available on the new Stadium website.

3.7.3 Other Transportation Modes

3.7.3.1 Pedestrian Facilities

The Stadium site is surrounded by a robust street grid and pedestrian sidewalk network that provides good pedestrian access from throughout the city to the Stadium site. The anticipated pedestrian flows into and out of the new Stadium by direction are as follows:

- 52 percent to/from west
- 18 percent to/from north
- 18 percent to/from south
- 12 percent to/from east

The total volume of pedestrians in the Proposed Project study area is expected to increase by up to 8,000 as a result of the increased seating capacity of the new Stadium. This is expected to be most evident within the immediate area around the new Stadium but also throughout the downtown area. Based on existing and expected parking utilization, as discussed in Section 3.7.2.1, the increase in pedestrian flows outside the Proposed Project area would be expected primarily to and from the area north of Washington Avenue and to the Central Downtown area (east of 2nd Avenue). This would be expected to result in increased pedestrian volumes along Chicago Avenue to the north and on 4th Street, 5th Street, and 6th Street to the west. In the scenario with Park Avenue and Portland Avenue closed during weekend event arrival, pedestrian flows would be expected to be further concentrated along 4th Street and 5th Street based on the activities anticipated to occur in those blocks between Portland Avenue and the new Stadium.

The Proposed Project includes construction of the following pedestrian facilities:

- 8- to 20-foot public sidewalks around the new Stadium. No sidewalk improvements have been identified in the draft design plans outside the Proposed Project area. Proposed at-grade pedestrian access from transit and parking facilities to the new Stadium are shown in **Figure 3.7-15**.
- Skyways connecting the new Stadium to the proposed McGrew Block parking structure (Reserved Parking Plan A and Reserved Parking Plan B), the 1st Covenant Church parking structure (Reserved Parking Plan A), and the 1010 Building parking structure (Reserved Parking Plan A and Reserved Parking Plan B). Additionally, a skyway will connect the proposed parking structure on the McClellan Block (Reserved Parking Plan B) to the parking structure on the McGrew Block (see **Figure 3.7-16**). The skyways would be available to all event attendees for entrance and exit from the new Stadium to reduce the potential pedestrian/vehicle and pedestrian/LRT conflicts at street level.
- A tunnel is proposed to connect the new Stadium to the Downtown East Ramp.

In addition to new pedestrian facilities, the closure and vacation of 5th Street between 11th Avenue and either Chicago Avenue or Park Avenue will result in the removal of the existing barrier between 5th Street and 6th Street. This will improve pedestrian connectivity between the Elliot Park Neighborhood and the new Stadium, as well as to the Downtown East Neighborhood and the Mississippi River. However, the removal of the barrier could result in pedestrian crossings of 6th Street at mid-block locations, especially before and after events. Mid-block crossings, particularly when they occur during times of heavy traffic flow such as peak hours and during events, create safety issues and impact roadway capacity and vehicle traffic flow. The Proposed Project should therefore provide infrastructure to direct pedestrian flows and crossings of 6th Street to controlled locations. At least one identified pedestrian crossing of 6th Street, between the existing signals at 11th Avenue and Chicago Avenue, will likely be needed. Control of pedestrians between the designated crossings will be needed during events but may not be needed during non-event times.

Construction of a park on the McClellan Block would provide an enhanced pedestrian connection to the Stadium site from areas to the northwest. The proposed construction of a plaza/park space east of 5th Avenue would provide an enhanced pedestrian connection to the new Stadium from areas to the west.

The draft design plans do not address pedestrian infrastructure or flows in the plaza area or at the 4th Street/Chicago Avenue intersection, both of which were identified by the City of Minneapolis and Metro Transit as existing issues. The projected increase in transit ridership for westbound LRT lines, as discussed in Section 3.7.3.3, in addition to causing potential passenger queuing issues at 4th Street/Chicago Avenue would also be expected to result in increased pedestrian crossings of the LRT line.

These areas could potentially be addressed through at-grade or grade separated designs.

Draft design plans call for several driveways for on-site drop-off of event attendees along both 4th Street and 6th Street. The creation of new driveways has the potential to create additional conflicts with pedestrians entering and exiting the new Stadium. These potential conflict areas will need to be further addressed in the design of the sidewalks and driveways and may also need to be managed during events using traffic control officers.

Mitigation Measures

The following summarizes the potential pedestrian impacts under the Proposed Project and recommended mitigation measures:

- New skyways built as part of proposed parking structures should allow access to the new Stadium for both event attendees with reserved parking and suite level seating, as well as general event ticket holders.
- The MSFA, in consultation with the City of Minneapolis, Metro Transit, and the Vikings, will work to design plaza areas and infrastructure that effectively address high pedestrian volumes in the 4th Street/Chicago Avenue area.
- Pedestrian crossings of 6th Street between Chicago Avenue and 11th Avenue need to be addressed by the pedestrian infrastructure of the new Stadium and the Traffic Management Plan. The pedestrian infrastructure could be either permanent or temporary, based on the differing needs during event and non-event times.
- The design of driveways into and out of the new Stadium site, particularly in high volume pedestrian areas, should address the potential vehicle/pedestrian conflict areas. During events these areas should be considered for control by a traffic control officer.

The City of Minneapolis has requested that pedestrian facilities be designed in consultation with the Pedestrian Facilities Design Guidelines that can be found in the Access Minneapolis Plan. The Pedestrian Master Plan also provides a higher-level overview of design goals for pedestrian facilities in the city. The City of Minneapolis is currently working on creating guidelines for comingled pedestrian and bicycle facilities as part of the Gateway project, and draft concepts can be made available for guidance on the design of the pedestrian facilities for the Proposed Project.

3.7.3.2 Bicycle Facilities

Affected Environment

Within the study area, there are existing on-street bike lanes on 6th Street (eastbound only), 4th Street (eastbound only), 3rd Street (westbound only), Park Avenue (northbound only), Portland Avenue (southbound only), 5th Avenue (northbound only), 4th Avenue (southbound only), and 11th Avenue. An on-street bicycle lane along Norm McGrew Place connects the eastbound 4th Street facilities with the westbound 3rd Street facilities and also connects to the off-street bicycle trail that starts at 9th Avenue and merges into the Hiawatha Bike Trail which runs parallel to the Hiawatha LRT line as it heads southeast. These facilities are planned to remain in place with the Proposed Project (see **Figure 3.7-17**). Counts of existing bicycle parking during a Metrodome event showed approximately 20 bicycles parked on or adjacent to the stadium site. The Metrodome has one bicycle rack located in the southeast corner of the site.

Environmental Consequences

The Proposed Project identifies construction of an off-street two-way bicycle path on the south side of the new Stadium, parallel to 6th Street between Kirby Puckett Place and 11th Avenue (see **Figure 3.7-18**). The proposed bicycle path would provide a new westbound connection between Kirby Puckett Place and 11th Avenue and would replace the existing eastbound bike lane on 6th Street. The Proposed Project presents some potential operational challenges for traffic and bicyclists at the intersections of 6th Street/Chicago Avenue and 6th Street/11th Avenue, where eastbound bicyclists

would need to transition between the on-street lanes on the south side of 6th Street and the off-street path on the north side of 6th Street.

The volume of bicycle traffic to and from the new Stadium could increase as a result of the increased seating capacity. The draft design plans and narrative show a minimum of 300 bicycle parking spaces to be provided on the new Stadium site, with the ability to add an additional 200 spaces if demand warrants. The bicycle parking is proposed to be located in the northeast and southwest areas of the site, which are conveniently located next to existing bike lanes.

While it is proposed that Park and Portland Avenues be closed before weekend game events, bicycle access will continue to be permitted along these streets.

The Minneapolis Bicycle Master Plan identifies on-street bike lanes planned on 5th Street from 1st Avenue North to 11th Avenue. The segment of bike lanes planned between Park Avenue or Chicago Avenue and 11th Avenue would be impacted by the proposed closure of this segment of 5th Street.

There are no other expected impacts to bicycle facilities except during construction when temporary closures and/or detours may be needed.

Mitigation Measures

The following summarizes the bicycle facility impacts expected as a result of the Proposed Project and recommended mitigation measures:

- As the design plans advance for the Proposed Project, provide for:
  - Adequate bicycle parking on-site to accommodate the actual bicycle parking demand for all events, along with wayfinding signing to direct bicyclists to the bicycle parking areas
  - Bicycle infrastructure to serve westbound bicyclists and connect to the planned bicycle lanes on 5th Street west of the closed segment
  - Signage along 6th Street to direct eastbound bicyclists riding along 6th Street to the two-way bicycle facility on the north side of the roadway
  - Intersection striping and/or signalization at the intersection of Chicago and 11th Avenues to provide safe crossing opportunities for bicyclists

As the design advances for the Proposed Project, there will be ongoing coordination with the Minneapolis Bicycle Advisory Committee regarding the effective integration of the proposed bicycle facilities with the existing and planned bicycle system.

No Action Alternative

No changes to bicycle facilities would occur with the No Action Alternative. Moreover, identified gaps within the system would not be addressed or partially addressed as part of the Proposed Project.

3.7.3.3 Transit Facilities

The proposed parking structure on the McGrew Block is planned to have the first level be designated for buses, which could be used as a Metro Transit bus layover facility during weekday non-event periods and for charter bus parking during events. Charter bus facilities are discussed further in the next section.

Currently, approximately 5,150 to 8,225 event attendees (10 to 15 percent) use Hiawatha LRT (Blue Line) to or from the Metrodome. The LRT service is also supplemented with approximately 20 express buses that take passengers to park-and-ride locations along the Hiawatha LRT line after events. These buses are staged along 4th Street, east of Chicago Avenue.

As noted during observations of existing conditions, the existing plaza area is not designed to conveniently and efficiently accommodate queuing and loading of LRT passengers at the Downtown

East LRT station. Existing queues extended over much of the existing plaza area, and passenger queues took approximately one hour to clear after the end of the game. Transit ridership for events is expected to increase with the opening of the Central Corridor (Green Line), Southwest (Green Line Extension), and Bottineau LRT (Blue Line Extension) LRT. Metro Transit has identified the need for approximately 78,800 to 100,600 square feet of queuing space for eastbound LRT passengers and 69,000 to 90,700 square feet of queuing space for westbound passengers (*Capacity for Special Events at the Downtown East LRT Station*, 2012).

The projected 2017 event transit ridership forecast by Metro Transit was approximately 16,400 attendees (average), representing about 22 percent of Stadium capacity, and the projected 2030 event transit ridership was approximately 31,000 attendees (average), representing about 42 percent of Stadium capacity. If those forecasts are not met, due to a variety of factors, it is estimated that for every 1,000 event attendees that arrive and depart by passenger vehicle rather than transit, approximately 180 additional vehicles would be expected in the arrival peak hour and approximately 250 additional vehicles in the departure peak hour.

As discussed in Section 3.7.3.1, the City of Minneapolis and Metro Transit have identified concerns with the existing conflicts between pedestrians and LRT at the 4th Street/Chicago Avenue intersection during events. These conflicts not only have impacts on pedestrian flow and pedestrian safety but also impact the ability of trains to enter and leave the LRT station.

Although the current use of express buses is necessitated due to LRT system capacity constraints, Metro Transit has indicated that they would expect to continue to use up to 20 express buses to supplement LRT. Staging and loading areas for these buses will need to be identified to provide space for up to 10 eastbound buses (Hiawatha and Central Corridor lines) and 10 westbound buses (Southwest and Bottineau lines) in 2030. The loading area should be both visible to attendees exiting the new Stadium and also provide relatively convenient access to the freeway network to efficiently exit the downtown area.

The *Minnesota Urban Ballpark EIS* (2007) identified anticipated transit ridership for a weekend baseball event of approximately seven percent, equivalent to approximately 2,900 passengers. In a dual event scenario, with events at both the new Stadium and Target Field, the capacity of the LRT system would be expected to be met or exceeded. The potential impacts of this type of scenario could be lower transit ridership than a typical event at the new Stadium, due to the capacity constraints, and therefore increased demands on the roadway network, which will already see increased demand due to traffic and parking for both events. In this scenario, staggering of the start times of the events would help to ease the impacts on the overall transportation and parking systems. Promoting early arrivals and later departures to all event attendees, as well as carpooling, will also be important measures.

Mitigation Measures

The following summarizes the transit impacts expected as a result of the Proposed Project and recommended mitigation measures:

- As the design plans advance for the Proposed Project, pedestrian crossings of the LRT line at 4th Street/Chicago Avenue will be needed to order to efficiently move trains in and out of the station.
- Inclusion of transit wayfinding and signage to direct transit passengers to the correct areas to purchase tickets and queue for the appropriate LRT line. This will become increasingly important with the addition of new or extended LRT service.
- Staging and loading area close to the new Stadium needs to be identified for up to 20 Metro Transit express buses that would be used to supplement LRT service. Convenient access to the freeway network from the staging and loading area should be provided.

- Promotion of early arrival and late departure during dual event scenarios will be necessary in order to avoid exceeding the capacity of the transit system.

3.7.3.4 Other Modes

Charter Buses

The proposed parking structure on the McGrew Block is planned to have the first level be designated for charter buses during events. A bus routing plan will need to be developed to show charter bus circulation, drop-off, and storage. Up to 40 charter buses are anticipated for an NFL event. If all 40 charter buses cannot be accommodated in the parking structure on the McGrew Block, secondary areas for charter bus staging will need to be identified and signed. This should be determined as part of the parking structure design and the development of the Traffic Management Plan.

Taxis

A designated area will be needed to accommodate taxi loading and staging at the new Stadium, as well as drop-offs. The existing taxi zone along 6th Street between Park Avenue and Chicago Avenue may be impacted if the 6th Street contraflow lane option is chosen and the contraflow lane is provided to Park Avenue.

Trucks

Truck access to the new Stadium, as shown in the draft design plans, is planned to be provided from 11th Avenue and from 4th Street. These accesses will provide for shipping and receiving to the new Stadium but also will be used for media trucks. The volume of truck traffic on a typical weekday would be anticipated to be minimal and the impacts on the peak hours would be minimal, and comparable to the existing operations. Truck access during peak event arrival and departure should be avoided when possible due to the potential impacts on traffic flows near the Stadium site and the potential pedestrian conflicts.

Mitigation Measures

- A charter bus routing plan should be developed to address charter bus circulation, drop-off areas, and staging. If the number of charter buses exceeds the capacity of the McGrew Block parking structure, additional areas will need to be identified and signed. The charter bus operations will be addressed as part of the Traffic Management Plan.
- One or more taxi zones need to be identified near the new Stadium. The zones need to be convenient to the new Stadium, provide adequate space to meet the observed demand, and be signed accordingly.
- Truck access to the site for deliveries and media access should be done outside the event arrival and departure time periods.

3.7.3.5 Other Transportation Mitigation Strategies

From the evaluation of pedestrian, bicycle, transit, and other transportation modes, potential mitigation measures have been developed to improve the safety and efficiently of the transportation network around the new Stadium. The bullets below summarize all the mitigation measures discussed in this section.

- New skyways built as part of proposed parking structures should allow access to the new Stadium for both event attendees with reserved parking and suite level seating, as well as general event ticket holders.
- The MSFA, in consultation with the City of Minneapolis, Metro Transit, and the Vikings, will work to design plaza areas and infrastructure that effectively address high pedestrian volumes in the 4th Street/Chicago Avenue area.

- Pedestrian crossings of 6th Street between Chicago Avenue and 11th Avenue will be addressed by the pedestrian infrastructure of the new Stadium and the Traffic Management Plan. The pedestrian infrastructure could be either permanent or temporary, based on the differing needs during event and non-event times.
- The design of driveways into and out of the new Stadium site, particularly in high volume pedestrian areas, should address the potential vehicle/pedestrian conflict areas. During events these areas should be considered for control by a traffic control officer.
- Adequate bicycle parking on-site to accommodate the actual bicycle parking demand for all events, along with wayfinding signing to direct bicyclists to the bicycle parking areas
- Bicycle infrastructure to serve westbound bicyclists and connect to the planned bicycle lanes on 5th Street west of the closed segment
- As the design plans advance for the Proposed Project, pedestrian crossings of the LRT line at 4th Street/Chicago Avenue will need to be addressed in order to efficiently move trains in and out of the station and achieve the projected ridership.
- Inclusion of transit wayfinding and signage are needed to direct transit passengers to the correct areas to purchase tickets and queue for the appropriate LRT line. This will become increasingly important with the addition of new or extended LRT service.
- Staging and loading area close to the new Stadium needs to be identified for up to 20 Metro Transit express buses that would be used to supplement LRT service. Convenient access to the freeway network from the staging and loading area should be provided.
- Promotion of early arrival and late departure during dual event scenarios will be necessary in order to avoid exceeding the capacity of the transit system.
- A charter bus routing plan should be developed to address charter bus circulation, drop-off areas, and staging. If the number of charter buses exceeds the capacity of the McGrew Block parking structure, additional areas will need to be identified and signed. The charter bus operations will be addressed as part of the Traffic Management Plan.
- One or more taxi zones need to be identified near the new Stadium. The zones need to be convenient to the new Stadium, provide adequate space to meet the observed demand, and be signed accordingly.
- Truck access to the site for deliveries and media access should be done outside the event arrival and departure time periods.

3.7.4 Temporary Transportation Impacts

A transportation analysis was completed to determine the temporary impacts of using TCF Bank Stadium during the 2014 and 2015 seasons, and possibly the 2016 season depending on the construction schedule of the new Stadium. This analysis identified potential traffic impacts, available parking locations, and potential mitigation measures to minimize the impacts to the University of Minnesota campus and the surrounding neighborhoods as a result of the temporary use. This analysis compared an existing University of Minnesota football game event at TCF Bank Stadium (approximately 50,000 seats) to a proposed NFL event with expanded seating to accommodate approximately 53,000 attendees.

3.7.4.1 Event Trip Generation

An existing University of Minnesota football game has a different expected demographic of fans than an NFL event, which results in different estimates of vehicle traffic generated by the two types of events at the same facility. One key component of the different vehicle traffic is the amount of

students that attend a University of Minnesota football game. Many of these game attendees walk to the stadium from campus and therefore do not generate vehicle trips into or out of the area. The other key difference is planned improvements to TCF Bank Stadium to increase the number of seats for a capacity event from 50,000 to up to 53,000.

Based on information provided in the *University of Minnesota On-Campus Football Stadium Final Environmental Impact Statement* (February 2006), approximately 15,700 vehicle trips are currently expected for a capacity University of Minnesota football game at TCF Bank Stadium. This estimate assumes:

- 50,000 seats
- 7,500 people walk, bike, or ride transit (mainly students)
- Average vehicle occupancy of 2.7

For a capacity NFL event at TCF Bank Stadium, approximately 16,400 vehicle trips are expected. This implies that an additional 700 parking spaces need to be identified for a Vikings game when compared to a Gopher football game. This estimate assumes:

- A capacity event of 53,000 people
- 500 people arrive via Metro Transit Bus
- 5,000 people arrive via LRT
- 2,000 people arrive via charter buses
- 500 people walk/bike
- Average vehicle occupancy of 2.75

3.7.4.2 Parking Evaluation

Based on information provided in the *University of Minnesota On-Campus Football Stadium Final Environmental Impact Statement* (February 2006) and the *TCF Bank Stadium Transportation Management Plan* (July 2009), approximately 15,300 public parking spaces are available on Saturday between the East Bank, West Bank, and St. Paul Campuses during a University of Minnesota football game. The breakdown of these parking spaces is as follows (see **Figure 3.7-19**):

- 9,400 spaces on East Bank Campus
- 1,600 spaces on West Bank Campus
- 4,300 spaces on St. Paul Campus

For an NFL event, it is assumed that the available parking on East Bank, West Bank, and St. Paul Campuses will be fully utilized (15,300 spaces). Since 16,400 vehicle trips are expected for an NFL event, an additional 1,100 parking spaces would need to be identified for use by event patrons. Potential parking locations for these vehicles could be downtown Minneapolis near the existing Metrodome stadium or at the Minnesota State Fairgrounds near the St. Paul Campus.

Assuming the average vehicle occupancy of 2.75, transit service from parking locations on the West Bank Campus, St. Paul Campus, downtown Minneapolis, and the Minnesota State Fairgrounds to TCF Bank Stadium would need to accommodate approximately 3,000 passengers. This service could be provided through a combination of the Central Corridor LRT line, which will connect the University of Minnesota to downtown Minneapolis, but shuttle buses will also be required. The University of Minnesota currently continuously operates 20 shuttle buses to remote parking facilities for football games at TCF Bank Stadium.

3.7.4.3 Traffic Analysis

No additional intersection traffic analysis was completed as part of this EIS. The previous TCF Bank Final EIS identified potential impacts to the transportation network as a result of a capacity event at the stadium. A Transpiration Management Plan was developed to mitigate these potential transportation impacts. From a traffic perspective, the parking on the East Bank Campus is nearly full for existing University of Minnesota football games, and therefore minimal additional vehicle traffic should be directly destined for the University of Minnesota East Bank Campus. As a result, the intersection operations before and after an NFL event at TCF Bank Stadium would be expected to be similar to that of a capacity University of Minnesota football game. The most likely areas for potential traffic impacts would be at other parking areas that are not currently used to capacity for a University of Minnesota football game. However, the most likely parking locations would be in downtown Minneapolis near the Metrodome, with LRT transit service to TCF Bank Stadium, or perhaps the State Fairgrounds with bus transit service provided similar to the current system of University of Minnesota shuttles.

3.7.4.4 Temporary Transportation Mitigation Strategies

The transportation mitigation strategies employed to address the impacts of the temporary use of TCF Bank Stadium for NFL events would be made up of the following elements:

- The current TCF Bank Stadium Transportation Management Plan (TMP) should be utilized for all NFL events. Key components of this plan include:
  - All parking spaces on East and West Bank are pre-reserved and require a parking pass
  - Traffic control officers will be used at certain intersections
  - Short-term road closures
  - Traffic signal timing plans for pre-game and post-game
  - Ingress/egress routes should be published on websites and distributed to ticket holders in advance of the event

In additional to the existing procedures in the TCF Bank Stadium Transportation Management Plan, the following should be incorporated:

- Currently, three to five charter buses arrive for University of Minnesota football games. The number of charter buses expected for an NFL event is assumed to increase to approximately 40 buses. Loading/unloading areas and parking locations need to be identified for the additional charter buses.
- During the Minnesota Vikings game against the Chicago Bears in December 2010, an increase in taxi use was observed. Drop-off and pick-up areas need to be identified for the expected increase in taxi use.
- Consider using additional shuttle bus service between the University of Minnesota St .Paul and East Bank Campuses.
- The University of Minnesota has a good portion of students that commute to campus. The scheduling of NFL events at TCF Bank Stadium should be avoided when school is in session since many of the parking spaces will be occupied by students.
- A proposed NFL event at TCF Bank Stadium could utilize the approximately 4,300 parking spaces at the St. Paul Campus. The scheduling of NFL events at TCF Bank Stadium should be avoided during the Minnesota State Fair since many of these parking spaces will be occupied by State Fair attendees. The State Fair also uses spaces on the University of Minnesota East Bank Campus.

- Management of the Stadium Village and East Bank CCLRT stations, including working with Metro Transit to provide additional trains during the arrival and departure of these larger events.
- Provide information and communication to NFL event patrons about traveling to games at TCF Bank Stadium, including:
  - If you do not have a parking pass on the University East Bank or West Bank, do not drive to these locations.
  - If you do not have a reserved parking space on the University East Bank or West Bank, use your existing parking location in downtown Minneapolis and use the new CCLRT transit service. For patrons traveling to/from the eastern portion of the Twin Cities, consider parking at the University of Minnesota St. Paul Campus and using the shuttle service.
  - The Hiawatha LRT line can continue to be used to travel to games via transfer to the new CCLRT line at the Downtown East station.
  - Use of communication to improve the transportation experience, including links to websites, media, mailings to tickets holders, etc.
- Coordination between the MSFA, Vikings, University of Minnesota, City of Minneapolis, Metro Transit, representatives of the adjacent neighborhoods, State Fair, and MnDOT will be necessary.

3.8 Vehicle-Related Air Emissions

3.8.1 Emission from Vehicles Traveling to/from the Stadium

3.8.1.1 Affected Environment

Motorized vehicles affect air quality by emitting airborne pollutants. Changes in traffic volumes, travel patterns, and roadway locations affect air quality by changing the number of vehicles and the congestion levels in a given area. The air quality impacts from the Proposed Project are analyzed by addressing criteria pollutants, a group of common air pollutants regulated by the US Environmental Protection Agency (EPA) on the basis of criteria (i.e., information on health and/or environmental effects of pollution). The criteria pollutants identified by the EPA are ozone, particulate matter, carbon monoxide, nitrogen dioxide, lead, and sulfur dioxide. Potential impacts resulting from these pollutants are assessed by comparing projected concentrations to National Ambient Air Quality Standards (NAAQS). In addition to the criteria air pollutants, the EPA also regulates air toxics. The scope and methods of the analysis documented in this section were developed in collaboration with the MPCA.

3.8.1.2 Environmental Consequences

NAAQS Criteria Pollutants

- Ozone

Ground-level ozone is a primary constituent of smog and is a pollution problem throughout many areas of the United States. Exposures to ozone can make people more susceptible to respiratory infection, result in lung inflammation, and aggravate preexisting respiratory diseases such as asthma. Ozone is not emitted directly from vehicles but is formed as volatile organic compounds (VOCs) and nitrogen oxides (NO_x) react in the presence of sunlight. Transportation sources emit NO_x and VOCs and can therefore affect ozone concentrations. However, due to the phenomenon of atmospheric formation of ozone from chemical precursors, concentrations are not expected to be elevated near a particular roadway.

The MPCA, in cooperation with various other agencies, industries, and groups, has encouraged voluntary control measures for ozone and has begun developing a regional ozone modeling effort. Ozone concentrations in the lower atmosphere are influenced by a complex relationship of precursor concentrations, meteorological conditions, and regional influences on background concentrations. MPCA staff have begun development of ozone modeling for the Twin Cities metropolitan area. The MPCA has recently indicated that the ozone models currently use federal default traffic data and a relatively coarse modeling grid. As such, ozone modeling in Minnesota is in its developmental stage, and there is therefore no available method of determining the contribution of a single roadway to regional ozone concentrations. Ozone levels in the Twin Cities metropolitan area currently meet state and federal standards, and reductions in ozone levels have been observed between 2007 and 2010. Additionally, the state of Minnesota is classified by the EPA as an "ozone attainment area," which means that Minnesota has been identified as a geographic area that meets the national health-based standards for ozone levels. Because of these factors, a quantitative ozone analysis was not conducted for this EIS.

- Particulate Matter

Particulate matter (PM) is the term for particles and liquid droplets suspended in the air. Particles come in a wide variety of sizes and have been historically assessed based on size, typically measured by the diameter of the particle in micrometers. $PM_{2.5}$ or fine particulate matter refers to particles that are 2.5 micrometers or less in diameter. PM_{10} refers to particulate matter that is 10 micrometers or less in diameter.

Motor vehicles (i.e., cars, trucks, and buses) emit direct PM from their tailpipes, as well as from normal brake and tire wear. Vehicle dust from paved and unpaved roads may be re-entrained, or re-suspended, in the atmosphere. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur dioxide, nitrogen oxides, and VOCs. $PM_{2.5}$ can penetrate the human respiratory system's natural defenses and damage the respiratory tract when inhaled. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including:

- Premature death in people with heart or lung disease
- Nonfatal heart attacks
- Irregular heartbeat
- Aggravated asthma
- Decreased lung function
- Increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing[3]

On December 14, 2012, the EPA issued a final rule revising the annual health NAAQS for fine particles ($PM_{2.5}$). The EPA website states:

> With regard to primary (health-based) standards for fine particles (generally referring to particles less than or equal to 2.5 micrometers (mm) in diameter, $PM_{2.5}$), the EPA is strengthening the annual $PM_{2.5}$ standard by lowering the level to 12.0 micrograms per cubic meter ($\mu g/m^3$). The existing annual standard, 15.0 $\mu g/m^3$, was set in 1997. The EPA is revising the annual $PM_{2.5}$ standard to 12.0 $\mu g/m^3$ so as to provide increased protection against health effects associated with long- and short-term exposures (including premature mortality, increased hospital admissions and emergency department visits, and development of chronic respiratory disease), and

[3] Source: http://www.epa.gov/air/particlepollution/health.html

> to retain the 24-hour $PM_{2.5}$ standard at a level of 35 µg/m^3 (the EPA issued the 24-hour standard in 2006). The EPA is revising the Air Quality Index (AQI) for $PM_{2.5}$ to be consistent with the revised primary $PM_{2.5}$ standards.[4]

The EPA also retained the existing standards for coarse particle pollution (PM_{10}). The NAAQS 24-hour standard for PM_{10} is 150 µg/m^3, which is not to be exceeded more than once per year on average over three years.

The entire state of Minnesota has been designated as an unclassifiable/attainment area for PM. This means that Minnesota has been identified as a geographic area that meets the national health-based standards for PM levels and therefore is exempt from performing PM qualitative hot-spot analyses.

While Minnesota has been identified as a geographic area that meets the national health-based standards for PM levels, ambient concentrations of $PM_{2.5}$ in the Twin Cities region are nearer to national standards following EPA's 2012 revision to $PM_{2.5}$ standards. MPCA has recommended a series of best practices for the construction phase of the Proposed Project to minimize $PM_{2.5}$ emissions from diesel-powered construction equipment. Details of these practices are discussed in Section 3.8.2.3.

- Nitrogen dioxide (Nitrogen oxides)

Nitrogen oxides, or NO_x, are the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. Nitrogen oxides form when fuel is burned at high temperatures, as in a combustion process. The primary sources of NO_x are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels. The MPCA's *Annual Pollution Report to the Legislature: A Summary of Minnesota's Air Emissions and Water Discharges* (April 2011) indicates that:

> On-road gasoline vehicles and diesel vehicles account for 40% of NO_x emissions in Minnesota. In addition to being a precursor to ozone, NO_x can cause respiratory irritation in sensitive individuals and can contribute to acid rain.

Nitrogen dioxide (NO_2), which is a form of nitrogen oxide (NO_x), is regularly monitored in the Twin Cities metropolitan area. Currently, NO_2 levels meet state and federal standards.

Within the Proposed Project area, it is unlikely that NO_2 standards will be approached or exceeded based on the relatively low ambient concentrations of NO_2 in Minnesota and the long-term trend toward reduction of NO_x emissions. Because of these factors, a specific analysis of NO_2 was not conducted for this EIS.

- Sulfur Dioxide

Sulfur dioxide (SO_2) and other sulfur oxide gases (SO_x) are formed when fuel containing sulfur, such as coal, oil, and diesel fuel, is burned. Sulfur dioxide is a heavy, pungent, colorless gas. Elevated levels can impair breathing, lead to other respiratory symptoms, and at very high levels aggravate heart disease. People with asthma are most at risk when SO_2 levels increase. Once emitted into the atmosphere, SO_2 can be further oxidized to sulfuric acid, a component of acid rain.

The MPCA's *Annual Pollution Report to the Legislature: A Summary of Minnesota's Air Emissions and Water Discharges* (April 2011) indicates that on-road mobile sources account for just 14 percent of SO_2 emissions in Minnesota. Over 53 percent of SO_2 released into the air comes from electric utilities, especially those that burn coal. MPCA monitoring shows that ambient SO_2 concentrations are consistently below state and federal standards. The MPCA has concluded that long-term trends

[4] Source: http://www.epa.gov/pm/actions.html

in both ambient air concentrations and total SO_2 emissions in Minnesota indicate steady improvement.

Emissions of sulfur oxides from transportation sources are a small component of overall emissions and continue to decline due to the desulphurization of fuels. Additionally, the state of Minnesota is classified by the EPA as a "sulfur dioxide attainment area," which means that Minnesota has been identified as a geographic area that meets the national health-based standards for sulfur dioxide levels. Because of these factors, a quantitative analysis for sulfur dioxide was not conducted for this EIS.

- Lead

Due to the phase out of leaded gasoline, lead is no longer a pollutant associated with vehicular emissions.

- Carbon Monoxide

Carbon monoxide (CO) is the traffic-related pollutant that has been of concern in the Twin Cities metropolitan area. In 1999, the EPA redesignated all of Hennepin, Ramsey, Anoka, and portions of Carver, Scott, Dakota, Washington, and Wright counties as a maintenance area for CO. This means the area was previously classified as a nonattainment area but has now been found to be in attainment. This area includes the Proposed Project area, which is located in Hennepin County. Evaluation of CO for assessment of air quality impacts is required for environmental approval.

- Air Quality Conformity

Conformity ensures that public investments will not result in transportation impacts causing the state to return to a condition of nonattainment by exceeding federal standards for ambient CO concentrations. On November 8, 2010, the EPA approved a limited maintenance plan request for the Twin Cities maintenance area. Under the limited maintenance plan, the level of CO emissions and resulting ambient concentrations will be monitored to demonstrate attainment of the CO NAAQS.

Transportation conformity will be evaluated for the Proposed Project based on the results of detailed intersection carbon monoxide dispersion analysis. Results from these "hot-spot" analyses demonstrating that projected carbon monoxide concentrations are below state and federal standards will determine that the Proposed Project will not be expected to result in a compliance violation.

- Hot-Spot Analysis

The effects of the Proposed Project on air quality were examined through analysis of the predicted impacts on CO concentrations. The following section discusses the CO analysis modeling methods and results.

To assess CO concentration changes, background concentrations were measured and adjusted for future background traffic growth and changes in vehicle emissions. Potential CO impacts on air quality were analyzed with respect to intersection conditions for the Proposed Project. One year after opening conditions (2017) traffic was used to model future CO concentrations as the worst-case conditions. The methods, procedures, and scope of this analysis were developed in collaboration with MPCA.

Air quality modeling was performed using current versions of EPA CO emission (MOVES2010b) and dispersion modeling (CAL3QHC) software. All methods and procedures used in the air quality analyses are generally accepted by the EPA and MPCA as approved for industry-standard analytical methods.

Predicted CO concentrations have been compared to state and federal standards to determine whether the Proposed Project would be expected to exceed allowed levels. Federal NAAQS concentration limits for CO are 35 ppm for one-hour concentrations and nine ppm for eight-hour concentrations. Minnesota has a one-hour standard of 30 ppm for CO that is more stringent than the federal one-hour standard.

- Background Carbon Monoxide Concentrations

Background CO concentrations are needed for air quality analysis purposes to represent conditions without the influence of nearby vehicles. By definition, the background CO concentration in any particular area is that concentration which exists independently of direct contributions from nearby traffic. The background concentrations are added to intersection-scale modeled results to yield predicted CO levels.

Background CO concentrations for the analysis documented in this study were obtained from MPCA's monitoring site located at 528 Hennepin Avenue in downtown Minneapolis. The second-highest observed one-hour and eight-hour concentrations were obtained from MPCA's *2012 Annual Air Monitoring Network Plan* and are given in **Table 3.8-1**. The one-hour concentration during the 2010 period was 2.5 ppm, and the eight-hour concentration was 1.8 ppm. Background concentrations were also adjusted for future year 2017 conditions to account for background traffic growth, using a factor of 1.2. To represent worst-case conditions, no background reduction factor to account for future emissions-control improvements was used, which likely results in overestimations of ambient background CO concentrations. Results of background CO monitoring and the adjustment calculations are presented in **Table 3.8-1**.

Table 3.8-1. Background Carbon Monoxide Concentrations

528 Hennepin Avenue, Minneapolis (MPCA Site ID: 954)	1-Hour Concentration	8-Hour Concentration
Year 2010 – Second Highest Average Concentration	2.5 ppm	1.8 ppm
Background Traffic Growth – 2010 to 2017	1.2	1.2
Year 2017 Background Concentration	3.0 ppm	2.2 ppm

Source: *2012 Annual Air Monitoring Network Plan*, MPCA, July 2012, http://www.pca.state.mn.us/index.php/view-document.html?gid=15856

- Carbon Monoxide Emission Factors

EPA's Motor Vehicle Emissions Simulator (MOVES) software was used to develop emission factors for vehicles in the study area. This evaluation was completed using the MOVES run specification for a project-level analysis, as directed by EPA and FHWA for evaluation of air quality impacts in project-specific traffic evaluations. The modeling data sources and assumptions used in this analysis are outlined in **Table 3.8-2**.

Table 3.8-2. Project-Level MOVES2010 Input Data Sources

Data Input	Source
Links	Project-specific link characteristics: traffic volumes, number of lanes, speeds
Vehicle Source Type	2010 DVS Vehicle Registration Data for Hennepin County (Source: Metropolitan Council)
Link Drive Schedule	Not required
Off-Network Activity	2010 DVS Vehicle Registration Data for Hennepin County (Source: Metropolitan Council) Parking Facility Characteristics from Parking Analysis (Section 3.8.2)

Data Input	Source
Operating Mode Distribution	Parking Duration Distribution from Parking Analysis (Section 3.8.2)
Vehicle Age Distribution	2008 DVS Vehicle Registration Data for Metro Area (Source: MPCA)
Fuel Technologies	MOVES default
Fuel Supply	MOVES default
Fuel Formulation	MOVES default
Meteorology	Hennepin County MOVES Input Data for 2010 (Source: Metropolitan Council)
Inspection & Maintenance Coverage	MOVES default
Generic	Not required

The CO emissions factors were produced by the MOVES emission model at varying speeds for year 2017 conditions. **Table 3.8-3** below provides the emissions factors at all speeds evaluated for year 2017 conditions. Emission factors for speeds above zero miles per hour (mph) are given in grams per vehicle-mile (g/veh-mi), while the emission factor for idling vehicles is given in grams per vehicle-hour (g/veh-hr). These units correspond to the proper input values for the CAL3QHC model used to complete the CO dispersion analysis.

Table 3.8-3. MOVES2010 Carbon Monoxide Emissions Factors for Year 2017 Conditions

Speed	Carbon Monoxide Emission Factor
Idle	23.6 g/veh-hr
2.5 mph	20.1 g/veh-mi
3 mph	17.5 g/veh-mi
4 mph	14.3 g/veh-mi
5 mph	12.4 g/veh-mi
10 mph	8.5 g/veh-mi
15 mph	7.3 g/veh-mi
20 mph	6.5 g/veh-mi
25 mph	5.5 g/veh-mi
30 mph	5.2 g/veh-mi
35 mph	4.8 g/veh-mi
40 mph	4.5 g/veh-mi
45 mph	4.3 g/veh-mi
50 mph	4.2 g/veh-mi
55 mph	4.3 g/veh-mi
60 mph	4.3 g/veh-mi
65 mph	4.5 g/veh-mi

- Intersection Carbon Monoxide Analysis

Three assessments were performed to calculate carbon monoxide concentrations in the study area. Each assessment included adjacent signalized intersections that were determined to experience operational failures during Stadium events in the traffic operations analysis. Additional details of the traffic analysis and operational characteristics are provided in Section 3.7. The intersections selected represent the worst-case conditions in terms of congestion and idling vehicles. The locations selected for the assessments include:

- Assessment 1: Year 2017 Weekend Event Reserved Parking Plan B Departure Conditions
  - 3rd Street & Chicago Avenue
  - 3rd Street & Park Avenue
  - 4th Street & Park Avenue
- Assessment 2: Year 2017 Weekday Event Reserved Parking Plan B Arrival Conditions
  - 5th Street & 11th Avenue
  - 6th Street & 11th Avenue
- Assessment 3: Year 2017 Weekday Event Reserved Parking Plan B Arrival Conditions
  - Washington Avenue & 11th Avenue
  - Washington Avenue & I-35W Southbound Ramps
  - Washington Avenue & I-35W Northbound Ramps

Carbon monoxide concentrations near the intersections were estimated using forecast traffic volumes, proposed intersection geometrics, optimized signal timing, emission levels from the MOVES2010b model, and dispersion modeling using the EPA model CAL3QHC.

- Evaluation Results

The intersection CO modeling results are shown in **Table 3.8-4**. These results are the worst-case results from the CAL3QHC dispersion model, showing the location of the highest expected concentration, the value of the highest one-hour and eight-hour concentrations, and the wind angle that produced those concentrations. The CO results provided represent background CO concentrations plus modeled intersection CO concentrations.

Table 3.8-4. Carbon Monoxide Modeling Results

Assessment Conditions	Highest CO Receptor Location	1-Hour Concentration	8-Hour Concentration	Wind Direction
Assessment 1: Year 2017 Weekend Event Plan B Departure Conditions	Northeast Quadrant of 3rd Street and Park Avenue	3.8 ppm	2.8 ppm	240°
Assessment 2: Year 2017 Weekday Event Plan B Arrival Conditions	Southeast Quadrant of 6th Street and 11th Avenue	4.5 ppm	3.3 ppm	320°
Assessment 3: Year 2017 Weekday Event Plan B Arrival Conditions	Southwest Quadrant of Washington Avenue and 11th Avenue	6.2 ppm	4.4 ppm	120°

- Discussion and Conclusions

Intersection-level CO modeling was performed for the worst operating intersection under worst-case conditions. The worst-case was identified during Weekday Event Reserved Parking Plan B arrival conditions near the intersection of Washington Avenue and 11th Avenue, with a predicted one-hour concentration of 6.2 ppm and an eight-hour concentration of 4.4 ppm. Based on these results, concentrations of CO in the study area would not exceed the federal one-hour standard of 35 ppm, the Minnesota one-hour standard of 30 ppm, and the federal eight-hour standard of 9 ppm.

These CO modeling results show that the Proposed Project is not expected to cause CO concentrations exceeding state or federal standards. Since no localized CO concentrations are expected to exceed allowable limits, the Proposed Project is also expected not to interfere with CO conformity requirements due to a compliance violation.

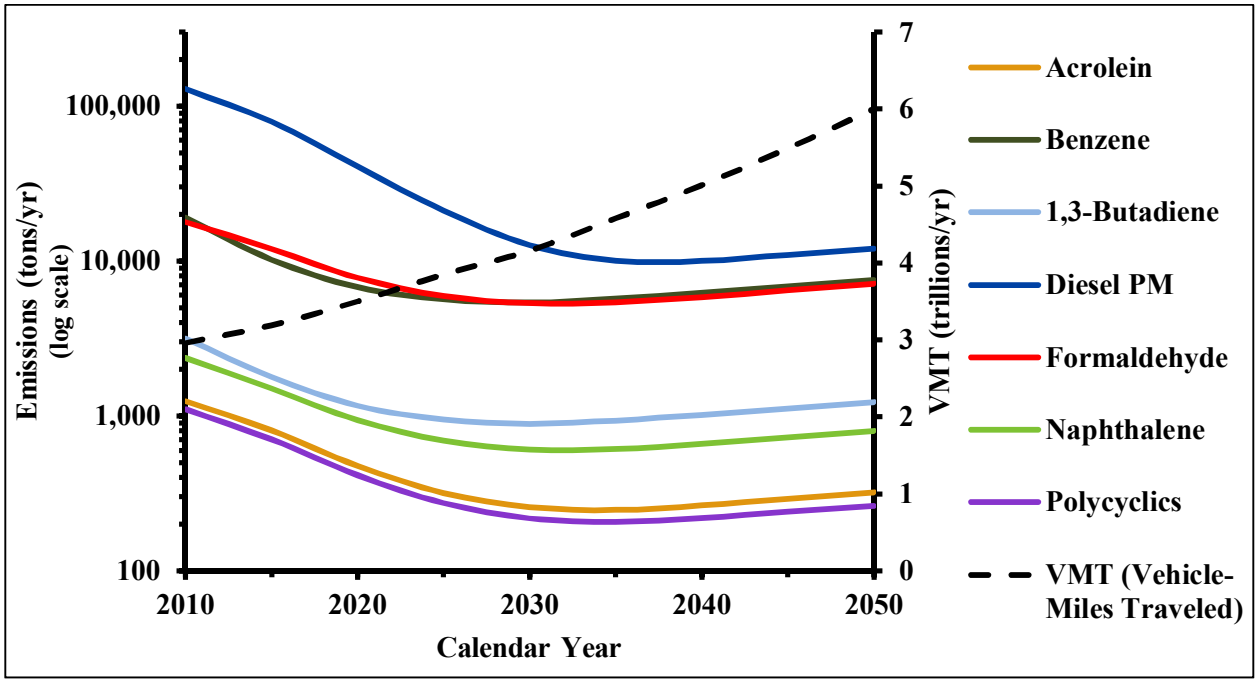
Mobile Source Air Toxics

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://www.epa.gov/iris/).

In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines.

Based on an FHWA analysis using EPA's MOVES2010b model, as shown in **Figure 3.8-1**, even if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

Figure 3.8-1. National MSAT Emission Trends 1999 - 2050 for Vehicles Operating on Roadways Using EPA's MOVES2010b Model



Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.
Source: EPA MOVES2010b model runs conducted during May - June 2012 by FHWA.
http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/nmsatetrends.cfm

Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the Proposed Project area are likely to be lower in the future in nearly all cases. On a regional basis, EPA's vehicle and fuel regulations will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

3.8.1.3 Mitigation

No unacceptable air quality impacts were identified for the Proposed Project. As a result, no mitigation measures are required for the operating phase of the Proposed Project.

3.8.1.4 No Action Alternative

Air quality impacts expected for the No Action Alternative are expected to be similar to the Proposed Project. Traffic characteristics were found to be similar between the No Action Alternative and the Proposed Project, with worst-case conditions occurring under the Proposed Project. The additional new Stadium capacity under the Proposed Project results in higher levels of congestion, which in turn creates the worst-case traffic operations. The carbon monoxide hot-spot intersection analysis completed in Section 3.8.1.2 demonstrated that no CO concentrations are expected to exceed state or federal standards. Since the Proposed Project conditions are slightly worse than No Action conditions, no unacceptable air quality impacts are expected under No Action conditions.

3.8.2 Construction-Related Emissions

3.8.2.1 Affected Environment

The construction of the Proposed Project would have the potential to affect traffic volumes and operations along roadways in and around the Proposed Project area. During construction, some intersections may need to temporarily operate with reduced capacities or temporarily close. Under these conditions, traffic would be expected to detour to parallel roadway facilities near the Proposed Project area. This increased traffic may result in increased emissions and higher concentrations of air pollutants near homes and businesses. These emissions levels would not be expected to result in localized concentrations that would exceed any state or federal air quality standards.

3.8.2.2 Environmental Consequences

In addition to traffic-related emissions increases, construction activities can also result in higher concentrations of air pollutants. Construction equipment powered by fossil fuels emits the same air pollutants as highway vehicles. Exposed earthen materials can also produce increased particulate matter when they are moved or disturbed by wind. It is not expected that concentrations of these air pollutants would exceed any state or federal standards.

3.8.2.3 Mitigation

The analysis presented in this EIS demonstrates there will be no anticipated exceedances of air pollutant concentrations during the construction phase of the Proposed Project; therefore, no mitigation measures are necessary. The State of Minnesota does not require permits related to air quality for projects of this type.

However, a series of BMPs will be implemented during construction to control dust. This may include the following preventive and mitigative measures:

- Minimization of land disturbance during site preparation
- Use of watering trucks to minimize dust
- Covering of trucks while hauling soil/debris off-site or transferring materials

- Stabilization of dirt piles if they are not removed immediately
- Use of dust suppressants on unpaved areas
- Minimization of unnecessary vehicle and machinery idling
- Revegetation of any disturbed land post-construction

Traffic control measures will be developed in subsequent stages of the Proposed Project to address detours and flow of traffic.

MPCA has developed this list of recommendations to reduce particulate emissions for construction of Minnesota projects. These recommendations are consistent with a report completed for the Lake Michigan Air Directors Consortium (LADCO) titled *Evaluation of Candidate Mobile Source Control Measures for LADCO States in 2009 and 2012* (March 21, 2007) which evaluated a series of control strategies for on-road and off-road equipment. In order to protect air quality in the Proposed Project area during construction, strategies to reduce diesel emissions will be required of site contractors to the extent feasible. These measures may include:

- Use or contract for the use of construction highway vehicles 2007 or newer, which are equipped with diesel particulate filters
- Use or contract for the use of construction off-road equipment 2007 or newer that meet Tier 3 emission standards
- Follow a strict no idling policy and make that part of any sub-contract
- Use a B-20 diesel blend to further reduce fine particle emissions

3.8.2.4 No Action Alternative

No air quality impacts are associated with construction under the No Action Alternative.

3.8.3 Potential Impacts Associated with the Use of TCF Bank Stadium

3.8.3.1 Affected Environment

Areas near TCF Bank Stadium will experience increased traffic and congestion during Minnesota Vikings events held there during the 2014 and 2015 seasons. Traffic conditions during these events are expected to be substantially similar to the traffic evaluation performed for the *University of Minnesota On-Campus Football Stadium Environmental Impact Statement* (February 2006). Air quality analyses were completed in that EIS for years 2009 and 2030 event conditions. These analyses concluded that no locations were expected to exceed state of federal standards.

3.8.3.2 Environmental Consequences

The analyses completed for the *University of Minnesota On-Campus Football Stadium EIS* were reevaluated for year 2014 conditions when Vikings events will be held at TCF Bank Stadium. This analysis was accomplished using methods consistent with those described in the carbon monoxide hot-spot intersection evaluation documented in Section 3.8.1.2. For this EIS, the same intersections and traffic volumes were used as in the analysis for the *On-Campus Football Stadium EIS* but vehicle emission factors were updated with the MOVES2010b emission model to represent year 2014 conditions. Similarly, background carbon monoxide concentrations provided in **Table 3.8-1** were subject to background traffic growth for year 2014 conditions with a factor of 1.1. The resulting background concentrations are provided in **Table 3.8-5**.

Table 3.8-5. Background Carbon Monoxide Concentrations

528 Hennepin Avenue, Minneapolis (MPCA Site ID: 954)	1-Hour Concentration	8-Hour Concentration
Year 2010 – Second Highest Average Concentration	2.5 ppm	1.8 ppm
Background Traffic Growth – 2010 to 2014	1.1	1.1
Year 2014 Background Concentration	2.8 ppm	2.0 ppm

Source: *2012 Annual Air Monitoring Network Plan*, MPCA, July 2012, http://www.pca.state.mn.us/index.php/view-document.html?gid=15856

The MOVES model was used to prepare emission factors calculated for year 2014 conditions. All MOVES inputs were consistent with those documented in **Table 3.8-2**, but the year of analysis was changed to 2014. The resulting emission factors are provided in **Table 3.8-6**.

Table 3.8-6. MOVES2010 Carbon Monoxide Emission Factors for Year 2014 Conditions

Speed	Carbon Monoxide Emission Factor
Idle	36.7 g/veh-hr
2.5 mph	25.1 g/veh-mi
3 mph	21.7 g/veh-mi
4 mph	17.6 g/veh-mi
5 mph	15.1 g/veh-mi
10 mph	10.2 g/veh-mi
15 mph	8.6 g/veh-mi
20 mph	7.6 g/veh-mi
25 mph	6.6 g/veh-mi
30 mph	6.1 g/veh-mi
35 mph	5.6 g/veh-mi
40 mph	5.3 g/veh-mi
45 mph	5.0 g/veh-mi
50 mph	4.9 g/veh-mi
55 mph	4.9 g/veh-mi
60 mph	5.0 g/veh-mi
65 mph	5.2 g/veh-mi

The *University of Minnesota On-Campus Football Stadium EIS* included evaluation of three intersection areas during stadium event conditions. These locations encompass areas where significant vehicle congestion and heavy pedestrian activity will be present in conjunction with stadium events. These locations include:

- University Avenue/I-35W Interchange
  - University Avenue & I-35W Southbound Ramps
  - University Avenue & I-35W Northbound Ramps
  - University Avenue & 10th Avenue
- Franklin Avenue & East River Road & 27th Avenue
- University Avenue & Oak Street

Each of these locations was evaluated using EPA's CAL3QHC dispersion model. The results are presented in **Table 3.8-7** for each location, and the table denotes the receptor with the highest concentration, the worst-case one-hour and eight-hour concentrations, and the wind direction that produced those concentrations.

Table 3.8-7. Carbon Monoxide Modeling Results

Assessment Conditions	Highest CO Receptor Location	1-Hour Concentration	8-Hour Concentration	Wind Direction
University Avenue/ I-35W Interchange	Southeast Quadrant of University Avenue and I-35W Northbound Ramp	4.9 ppm	3.5 ppm	310°
Franklin Avenue & East River Road & 27th Avenue	Southwest Quadrant of Franklin Avenue and East River Road	3.9 ppm	2.8 ppm	240°
University Avenue & Oak Street	Southwest Quadrant of University Avenue and Oak Street	4.4 ppm	3.1 ppm	310°

The results in **Table 3.8-7** demonstrate that no locations are expected to exceed the state or federal standards for carbon monoxide concentrations. Therefore, the use of TCF Bank Stadium for Vikings events is not expected to cause any unacceptable air quality impacts.

3.8.3.3 Mitigation

No unacceptable air quality impacts were identified for temporary use of TCF Bank Stadium. As a result, no mitigation measures are required.

3.9 Odors, Noise, and Dust

This section presents potential impacts associated with construction noise, odors, and dust; vehicular traffic noise; and event noise. The description of the affected environment, the environmental consequences, and mitigation measures are presented separately for each of these three considerations.

3.9.1 Construction Phase Impacts

3.9.1.1 Affected Environment

Adjacent land uses surrounding the Proposed Project are a variety of typical land uses found in a major metropolitan downtown area, including multi-story offices, restaurants, hotels, government offices, institutional uses (churches), light warehousing, transportation uses (parking and LRT station), and supporting utility infrastructure. Residential land uses are also found within several blocks of the Proposed Project area.

3.9.1.2 Environmental Consequences

Odors

There will be the potential for construction-related odors to drift outside of the Proposed Project area during construction. These potential odors include, but are not limited to, diesel fuel and exhaust fumes from construction equipment, specifically where trucks and other heavy equipment are staging and queuing for earthmoving operations. Odors from products used in construction of the Proposed Project (e.g., roofing products) could also drift outside of the Proposed Project area during construction. Depending upon the wind and construction activities, some nearby properties could be temporarily affected.

Noise

Noise will be generated by equipment and vehicles used in the construction of the Proposed Project and associated improvements. Elevated noise levels during construction are unavoidable for this type of project. Noise levels and potential adverse effects due to construction activities will vary

depending on the type of equipment, the location of the equipment, the location of noise receptors, the duration of operations, and the time of operations. High-impact construction equipment (e.g., pile drivers) typically results in the greatest potential for construction noise issues. At a distance of 50 feet, an impact pile driver can produce peak noise levels of up to 101 decibels.[5] It is anticipated that construction of earth retaining systems in the northeast corner of the Proposed Project site will require pile driving.

Noise will also be generated during demolition of the existing Metrodome. Demolition methods have yet to be determined but could potentially include implosion. Demolition is anticipated to begin in the northeast corner of the existing Metrodome. The sequencing of building demolition activities will be determined during detail design.

Dust

Fugitive dust will occur during site grading and construction. Demolition of the Metrodome and other structures on the Metrodome property can also generate fugitive dust. Exposed soils on the site may be susceptible to wind erosion. Depending upon the wind, intervening structures, and construction conditions, some nearby properties may be temporarily affected by fugitive dust. After construction of the Proposed Project is complete, dust levels are anticipated to be minimal because all soil surfaces exposed during construction would be in permanent cover (i.e., paved or re-vegetated areas).

3.9.1.3 Mitigation

Odors

Due to the proximity of adjacent land uses and roadways, odors cannot be reasonably confined within the Proposed Project area. Several construction site staging practices could be employed to minimize construction-related odors. These include minimizing excessive idling of construction equipment and configuring the construction site to limit queuing of equipment during earthmoving activities.

Noise

There are several standard practices that could be used as necessary to control construction-related noise. Some of these methodologies are described below. The contractor would be required to adhere to City of Minneapolis noise control ordinances.

- Use of modern equipment and equipment that is in proper working order
- Hours and days of construction in compliance with City code
- Schedule more noise intense construction activities (e.g., use of high-impact construction equipment) during daytime hours
- Where practical and feasible, configure the construction site to minimize back-up alarm noise
- Provide advance notice to adjacent property owners regarding abnormally loud construction activities
- Provide a communications coordinator to function as a liaison between construction contractors and neighboring property owners to address complaints regarding construction noise

[5] Federal Highway Administration. *Construction Noise Handbook*. FHWA-HEP-06-015. DOT-VNTSC-FHWA-06-02. NTIS No. PB2006-109102. August 2006.

Dust

Dust generated during construction would be minimized through standard construction practices for dust control. The Proposed Project proposes to implement dust control BMPs including:

- Watering down the construction site as required
- Street sweeping as required
- Crushed rock filter at all construction entrances/exits

3.9.1.4 No Action Alternative

The No Action Alternative assumes continued use of the Metrodome, and construction activities would not occur at the Proposed Project site. As a result, there would be no temporary construction impacts related to odors, noise, and dust.

3.9.2 Vehicular Traffic Noise Analysis

3.9.2.1 Affected Environment

Background Information on Noise

Noise is defined as any unwanted sound. Sound travels in a wave motion and produces a sound pressure level. This sound pressure level is commonly measured in decibels. Decibels (dB) represent the logarithm of the ratio of a sound energy relative to a reference sound energy. For highway traffic noise, an adjustment, or weighting, of the high- and low- pitched sound is made to approximate the way that an average person hears sound. The adjusted sound levels are stated in units of "A-weighted decibels" (dBA). A sound increase of 3 dBA is barely noticeable by the human ear, a 5 dBA increase is clearly noticeable, and a 10 dBA increase is heard as twice as loud. For example, if the sound energy is doubled (i.e., the amount of traffic doubles), there is a 3 dBA increase in noise, which is just barely noticeable to most people. On the other hand, if traffic increases by a factor of ten, the resulting sound level will increase by about 10 dBA and be heard as twice as loud.

In Minnesota, traffic noise impacts are evaluated by measuring and/or modeling the traffic noise levels that are exceeded 10 percent and 50 percent of the time during the hours of the day and/or night that have the loudest traffic scenario. These numbers are identified as the L_{10} and L_{50} levels, respectively. The L_{10} value is the noise level that is exceeded for a total of 10 percent of an hour, or 6 minutes. The L_{50} value is the noise level that is exceeded for a total of 50 percent of an hour, or 30 minutes.

Table 3.9-1 provides a rough comparison of the noise levels of some common noise sources.

Table 3.9-1. Decibel Levels of Common Noise Sources

Sound Pressure Level (dBA)	Noise Source
140	Jet Engine (at 75 feet)
130	Jet Aircraft (at 300 feet)
120	Rock and Roll Concert
110	Pneumatic Chipper
100	Jointer/Planer
90	Chainsaw
80	Heavy Truck Traffic
70	Business Office
60	Conversational Speech
50	Library

Sound Pressure Level (dBA)	Noise Source
40	Bedroom
30	Secluded Woods
20	Whisper

Source: "A Guide to Noise Control in Minnesota," Minnesota Pollution Control Agency, http://www.pca.state.mn.us/index.php/view-document.html?gid=5355 accessed 3/29/2013.

Along with the volume of traffic and other factors (e.g., topography of the area and vehicle speed) that contribute to the loudness of traffic noise, the distance of a receptor from a sound's source is also an important factor. Sound level decreases as distance from a source increases. A general rule regarding sound level decrease due to increasing distance from a line source (roadway) is: beyond approximately 50 feet from the sound source, each doubling of distance from the line source over hard ground (such as pavement or water) will reduce the sound level by 3 dBA, whereas each doubling of distance over soft ground (such as vegetated or grassy ground) results in a sound level decrease of 4.5 dBA.

Minnesota State Noise Standards

Minnesota State Noise Standards have been established for daytime and nighttime periods. For residential land uses (identified as Noise Area Classification 1 or NAC 1), the Minnesota State Standards for L_{10} are 65 dBA for daytime and 55 dBA for nighttime; the standards for L_{50} are 60 dBA for daytime and 50 dBA for nighttime. The MPCA defines daytime as 7:00 AM to 10:00 PM and nighttime from 10:00 PM to 7:00 AM. State noise standards are depicted in **Table 3.9-2**. Minnesota State noise standards apply to the outdoor atmosphere (i.e., exterior noise levels).

Table 3.9-2. Minnesota State Noise Standards

Minnesota State Noise Standards					
Land Use	Noise Area Classification	Daytime Hours (7:00 AM to 10:00 PM)		Nighttime Hours (10:00 PM to 7:00 AM)	
		L10 (dBA)	L50 (dBA)	L10 (dBA)	L50 (dBA)
Residential	1	65	60	55	50
Commercial	2	70	65	70	65
Industrial	3	80	75	80	75

State noise standards apply to trunk highway facilities and local roadways within the city of Minneapolis. Minnesota Rules 7030.0050, subp. 3, lists exceptions to the State noise standards and land use classifications identified in **Table 3.9-2**. The noise area classification for a land use may be changed if applicable conditions in Minnesota Rules 7030.0050, subp. 3, are met. For example, under Minnesota Rules 7030.0050, subp. 3A, the daytime standard for Noise Area Classification (NAC) 1 is applied to NAC 1 during the nighttime if the land use activity does not include overnight lodging. Other exceptions for NAC 1, 2, and 3 are described in Minnesota Rules 7030.0050, subp. 3B through subp. 3D.

3.9.2.2 Affected Environment

The Proposed Project is located in the city of Minneapolis. Adjacent land uses surrounding the Proposed Project area include residential (multi-story condominiums), multi-story offices, restaurants, hotels, government offices, institutional uses (churches), light warehousing, transportation uses (parking and light rail transit station), and supporting utility infrastructure. For purposes of this traffic noise analysis, modeled receptor locations were identified within an area that extends from Washington Avenue to the north, 11th Avenue to the east, 8th Street to the south, and 5th Avenue to the west.

3.9.2.3 Environmental Consequences

Noise Monitoring

Noise level monitoring is commonly performed during a noise study to document existing noise levels. Existing noise levels were monitored at three sites adjacent to the Proposed Project area and were chosen to represent areas of outdoor human activity. Noise monitoring locations are described below (see also **Figure 3.9-1**).

- Monitoring site 1 (Receptor H) is located at 903 Washington Avenue. Receptor H represents an outdoor dining area of a commercial property along the south side of Washington Avenue.
- Monitoring site 2 (Receptor S) is located at 416 Portland Avenue. Receptor S represents an outdoor seating/gathering area in the northwest quadrant of the Portland Avenue/5th Street intersection.
- Monitoring site 3 (Receptor BB) is located at 1010 Metrodome Square (intersection of 11th Avenue and 7th Street). Receptor BB represents a courtyard area at the entrance to a multi-story office building.

Daytime noise levels were monitored on November 7, 2012. Noise levels were monitored at each receptor location twice; once during the morning and again during the afternoon. A trained noise monitoring technician was present at each session for the entire monitoring session to ensure correct operation of the noise meter. The morning and afternoon monitored levels are presented below in **Table 3.9-3**. Average monitored daytime traffic noise levels (average of morning and afternoon measurements) ranged from 60.0 dBA (L_{10}) to 63.6 dBA (L_{10}).

Table 3.9-3. Field Measurement Summary Table

Receptor ID	Location Description	Measurement Time		Measured Level (dBA)			
		Start	End	L_{10}	L_{50}	L_{90}	L_{eq}
H	903 Washington Avenue (outdoor dining area)	11:25 am	11:55 am	64.5	58.5	55.0	61.2
		2:47 pm	3:18 pm	62.5	58.0	54.0	60.1
S	416 Portland Avenue South (outdoor seating area across from Star Tribune building)	9:25 am	9:55 am	63.0	57.0	53.5	60.7
		12:53 pm	1:27 pm	61.5	55.5	52.0	59.7
BB	1010 Metrodome Square (Courtyard facing 7th Street)	10:23 am	10:53 am	60.0	54.5	50.5	57.9
		1:50 pm	2:25 pm	60.0	55.5	52.0	57.3

Field measurements are presented in **Table 3.9-4** along with the computer modeling results for existing daytime traffic noise levels using classified traffic counted during the measurement periods. Field measurements and modeling results presented in **Table 3.9-4** are an average of the morning and afternoon measurements described above.

Table 3.9-4. Field Measurements and Predicted Noise Levels

Receptor ID	Field Measurements*		Modeled Noise Levels†		Difference	
	L_{10} (dBA)	L_{50} (dBA)	L_{10} (dBA)	L_{50} (dBA)	L_{10} (dBA)	L_{50} (dBA)
H	63.6	58.3	65.2	60.4	1.6	2.1
S	62.3	56.3	64.7	60.5	2.4	4.2
BB	60.0	55.0	61.9	57.1	1.9	2.1

* Average of morning and afternoon field measurements
† Average of modeled noise levels using classified traffic counted during morning and afternoon measurement periods

A discrepancy equal to or less than 3.0 dBA between field measurements and modeled noise levels is considered acceptable for noise model validation. Field measurements at Receptors H, S, and BB were 1.6 dBA (L_{10}) to 2.4 dBA (L_{10}) less than modeled noise levels using classified traffic counted during the measurement periods (e.g., cars, medium trucks, heavy trucks) and posted speeds (e.g., 30 miles per hour). Because the field measurements are within 3.0 dBA (L_{10}) of the modeled levels, the model is considered validated.

Traffic Noise Modeling

Noise modeling for the Proposed Project was done using the noise prediction program MINNOISE31, a version of the Federal Highway Administration (FHWA) STAMINA model adapted by MnDOT for use in Minnesota. This model uses traffic volumes, speed, class of vehicle, and the typical characteristics of the roadway being analyzed (e.g., roadway horizontal and vertical alignment). The noise modeling assumed free-flow conditions through signalized intersections within and adjacent to the Proposed Project area. Traffic data input into the MINNOISE31 noise model input files for the Proposed Project included the existing PM peak hour (4:30-5:30 PM),[6] year 2017 No Action Alternative (weekday and weekend event arrival), and year 2017 Proposed Project traffic volumes (weekday and weekend event arrival). The 2017 Proposed Project weekend event arrival included evaluation of the East/West Alternate Plaza Configuration (i.e., Park Avenue and Portland Avenue closed between 4th Street and 5th Street two hours prior to weekend NFL games). To account for when congested conditions cause reduced speeds during the PM peak and event arrival periods, a default traffic volume of 700 vehicles per lane per hour was used in the noise model input files where appropriate.

Traffic noise levels were modeled for year 2017 (year of opening) because this represents a worst-case scenario compared to future year 2030 conditions. Lower traffic volumes are expected on City of Minneapolis streets under year 2030 conditions as a greater number of trips are predicted to use transit services. Traffic noise levels were also modeled for year 2017 Proposed Project under the Reserved Parking Plan B scenario only. Reserved Parking Plan B represents a worst-case scenario with respect to traffic noise for adjacent land uses because of a greater number of parking spaces (and corresponding traffic volumes) closer to the Proposed Project site.

Modeled Noise Receptor Locations

Traffic noise impacts were assessed by modeling noise levels at representative receptor sites adjacent to the Proposed Project area likely to be affected by changes in traffic patterns and volumes on local streets with the Proposed Project. Traffic noise levels were modeled at 45 representative receptor locations within the Proposed Project area representing exterior areas where frequent human use occurs (e.g., balconies/patios of residential properties, outdoor dining areas).

[6] Existing traffic volumes from year 2011 Minnesota Department of Transportation (MnDOT) counts for downtown Minneapolis. 2011 Publication Traffic Volumes Metro Street Series – 3E available on the MnDOT Website at http://www.dot.state.mn.us/traffic/data/data-products.html#volume, accessed 3/6/2013.

The model receptor locations are illustrated in **Figure 3.9-1**. Land uses are listed with each modeled receptor location in **Table 3.9-5 through Table 3.9-10**.

Noise Model Results (Weekday)

Results of the noise modeling analysis for weekday existing conditions (PM peak hour), the future (2017) No Action Alternative (PM peak hour), the future (2017) No Action Alternative (Event Arrival), and Proposed Project (Event Arrival) are tabulated in **Table 3.9-5 though Table 3.9-7**. The results of the weekday traffic noise modeling analysis (L_{10} and L_{50} descriptors) are summarized below.

Existing daytime modeled noise levels (PM peak hour) at modeled receptor locations range from 62.9 dBA (L_{10}) to 74.9 dBA (L_{10}). Modeled daytime traffic noise levels exceed State daytime L_{10} and L_{50} standards at 27 modeled receptor locations under existing PM peak hour conditions. In general, these modeled receptor locations primarily represent residential land uses (NAC 1). Modeled noise levels exceed State daytime L_{10} standards only at one commercial receptor location (Receptor U), while modeled noise levels at remaining receptor locations are below applicable State daytime L_{10} and L_{50} standards.

Future (2017) daytime modeled noise levels with the Proposed Project (weekday event arrival period) are predicted to range from 64.4 dBA (L_{10}) to 77.3 dBA (L_{10}). Modeled daytime traffic noise levels are predicted to increase by up to 1.8 dBA (L_{10}) compared to the No Action Alternative with weekday event arrival traffic. Modeled traffic noise levels are predicted to exceed State daytime L_{10} and L_{50} standards at 32 modeled receptor locations under the Proposed Project during weekday event arrival periods. Modeled noise levels are projected to exceed State daytime L_{50} standards only at one residential receptor location (Receptor J) and are predicted to exceed State daytime L_{10} standards only at one modeled receptor location (Receptor Y). Modeled noise levels at the remaining 11 receptor locations are projected to be below applicable State daytime L_{10} and L_{50} standards.

Table 3.9-5. Traffic Noise Analysis Model Results (Weekday) – Receptors A-I

Receptor ID	NAC*	Existing (2011) PM Peak Hour		No Action (2017) PM Peak Hour		No Action (2017) Event Arrival		Difference (No Action PM Peak – No Action Event Arrival)		Proposed Project (2017) Event Arrival, Parking Plan B		Difference (Event Arrival, Proposed Project – No Action)	
		L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
A (C)	2	**73.0**	**66.8**	**74.4**	**68.8**	**75.0**	**69.8**	0.6	1.0	**75.1**	**69.8**	0.1	0.0
B (R)	1	**73.6**	**67.2**	**75.0**	**69.3**	**75.7**	**70.2**	0.7	0.9	**75.7**	**70.3**	0.0	0.1
C-1 (R)	1	**73.3**	**66.9**	**74.7**	**69.0**	**75.4**	**70.0**	0.7	1.0	**75.4**	**70.1**	0.0	0.1
C-2 (R)	1	**73.1**	**66.9**	**74.5**	**68.9**	**75.2**	**69.9**	0.7	1.0	**75.2**	**70.0**	0.0	0.1
C-3 (R)	1	**72.8**	**66.8**	**74.2**	**68.8**	**74.9**	**69.8**	0.7	1.0	**74.9**	**69.9**	0.0	0.1
C-4 (R)	1	**72.5**	**66.6**	**73.9**	**68.7**	**74.5**	**69.6**	0.6	0.9	**74.6**	**69.7**	0.1	0.1
D (R)	1	**71.8**	**66.3**	**73.2**	**68.4**	**73.9**	**69.5**	0.7	1.1	**74.0**	**69.6**	0.1	0.1
E-1 (R)	1	**74.2**	**67.2**	**75.7**	**69.3**	**76.4**	**70.3**	0.7	1.0	**76.4**	**70.3**	0.0	0.0
E-2 (R)	1	**73.7**	**67.0**	**75.2**	**69.2**	**75.8**	**70.1**	0.6	0.9	**75.9**	**70.1**	0.1	0.0
E-3 (R)	1	**73.2**	**66.9**	**74.6**	**68.9**	**75.2**	**69.9**	0.6	1.0	**75.3**	**69.9**	0.1	0.0
E-4 (R)	1	**72.6**	**66.6**	**74.0**	**68.7**	**74.6**	**69.6**	0.6	0.9	**74.7**	**69.7**	0.1	0.1
E-5 (R)	1	**72.1**	**66.4**	**73.5**	**68.4**	**74.1**	**69.4**	0.6	1.0	**74.1**	**69.4**	0.0	0.0
E-6 (R)	1	**71.6**	**66.2**	**73.0**	**68.2**	**73.6**	**69.1**	0.6	0.9	**73.6**	**69.1**	0.0	0.0
F (C)	2	**70.3**	**65.7**	**71.6**	**67.5**	**72.3**	**68.4**	0.7	0.9	**72.3**	**68.5**	0.0	0.1
G-1 (R)	1	**73.7**	**67.2**	**75.2**	**69.4**	**76.0**	**70.5**	0.8	1.1	**76.0**	**70.6**	0.0	0.1
G-2 (R)	1	**73.3**	**67.1**	**74.7**	**69.2**	**75.5**	**70.3**	0.8	1.1	**75.6**	**70.4**	0.1	0.1
G-3 (R)	1	**72.8**	**66.9**	**74.3**	**69.0**	**75.0**	**70.1**	0.7	1.1	**75.0**	**70.2**	0.0	0.1
G-4 (R)	1	**72.3**	**66.7**	**73.8**	**68.8**	**74.5**	**69.9**	0.7	1.1	**74.5**	**69.9**	0.0	0.0
H (C)	2	65.1	60.9	66.3	62.6	66.9	63.3	0.6	0.7	67.0	63.5	0.1	0.2
I (C)	2	65.2	61.6	66.3	62.9	66.6	63.3	0.3	0.4	66.9	63.7	0.3	0.4
State Daytime Noise Standards													
NAC-1	--	65	60	65	60	65	60	--	--	65	60	--	--
NAC-2	--	70	65	70	65	70	65	--	--	70	65	--	--
NAC-3	--	80	75	80	75	80	75	--	--	80	75	--	--

Bold numbers are above State daytime standards.
(R) – Residential; (C) – Commercial; (B) – Business/Office; (Ch) – Church; (I) – Industrial; (P) – Park/Trail; (T) – Transportation
* Noise Area Classification (NAC) associated with each modeled receptor location.

Table 3.9-6. Traffic Noise Analysis Model Results (Weekday) – Receptors J-Z

Receptor ID	NAC*	Existing (2011) PM Peak Hour		No Action (2017) PM Peak Hour		No Action (2017) Event Arrival		Difference (No Action PM Peak – No Action Event Arrival)		Proposed Project (2017) Event Arrival, Parking Plan B		Difference (Event Arrival, Proposed Project – No Action)	
		L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
J (R)	1	62.9	59.9	63.9	**61.2**	64.2	**61.6**	0.3	0.4	64.7	**62.2**	0.5	0.6
K (C)	2	74.9	67.4	76.4	69.6	77.3	70.8	0.9	1.2	77.3	70.8	0.0	0.0
L-1 (R)	1	**70.2**	**65.5**	**71.8**	**67.8**	**72.4**	**68.7**	0.6	0.9	**72.5**	**68.7**	0.1	0.0
L-2 (R)	1	**70.1**	**65.5**	**71.8**	**67.8**	**72.3**	**68.6**	0.5	0.8	**72.4**	**68.6**	0.1	0.0
M-1 (R)	1	**67.6**	**61.4**	**69.8**	**64.4**	**70.3**	**65.1**	0.5	0.7	**70.3**	**65.2**	0.0	0.1
M-2 (R)	1	**67.4**	**61.4**	**69.7**	**64.3**	**70.1**	**65.1**	0.4	0.8	**70.2**	**65.1**	0.1	0.0
N (C)	2	66.4	61.6	68.2	64.1	68.7	64.8	0.5	0.7	68.8	64.9	0.1	0.1
O (R)	1	**66.2**	**61.7**	**67.4**	**63.4**	**68.2**	**64.5**	0.8	1.1	**68.3**	**64.8**	0.1	0.3
P (P)	1	**69.4**	**62.0**	**69.8**	**62.6**	**69.4**	**61.8**	-0.4	-0.8	**71.2**	**64.1**	1.8	2.3
Q (I)	3	68.1	62.2	69.9	64.2	69.8	63.9	-0.1	-0.3	70.2	64.6	0.4	0.7
R (C)	2	68.9	62.9	69.6	63.8	**70.4**	65.0	0.8	1.2	**71.0**	**65.9**	0.6	0.9
S (C)	2	66.6	60.7	68.3	62.6	69.0	63.5	0.7	0.9	69.4	64.2	0.4	0.7
T (T)	2	65.2	60.7	66.7	62.4	63.7	61.0	-3.0	-1.4	64.4	61.8	0.7	0.8
U (C)	2	**70.6**	64.5	**71.5**	**65.9**	**72.7**	**67.5**	1.1	1.6	**73.1**	**68.2**	0.4	0.7
V (C)	2	63.6	59.7	65.4	62.0	65.3	61.9	-0.1	-0.1	66.0	62.7	0.7	0.8
W (M)	1	**65.3**	**60.5**	**66.9**	**62.6**	**67.8**	**63.9**	0.9	1.3	**68.0**	**64.3**	0.2	0.4
X (C)	2	66.3	59.5	67.4	61.3	66.3	60.6	-1.1	-0.7	66.4	60.9	0.1	0.3
Y (C)	2	67.2	60.1	67.6	60.9	**70.3**	64.4	2.7	3.5	**70.6**	64.8	0.3	0.4
Z (R)	1	**66.6**	59.8	**66.9**	**60.4**	**69.6**	**63.9**	2.7	3.5	**69.8**	**64.4**	0.2	0.5
State Daytime Noise Standards													
NAC-1	--	65	60	65	60	65	60	--	--	65	60	--	--
NAC-2	--	70	65	70	65	70	65	--	--	70	65	--	--
NAC-3	--	80	75	80	75	80	75	--	--	80	75	--	--

Bold numbers are above State daytime standards.
(R) – Residential; (M) – Medical Services; (C) – Commercial/Business/Office; (Ch) – Church; (I) – Industrial; (P) – Park/Trail; (T) – Transportation
* Noise Area Classification (NAC) associated with each modeled receptor location.

Table 3.9-7. Traffic Noise Analysis Model Results (Weekday) – Receptors AA-FF

Receptor ID	NAC*	Existing (2011) PM Peak Hour		No Action (2017) PM Peak Hour		No Action (2017) Event Arrival		Difference (No Action PM Peak – No Action Event Arrival)		Proposed Project (2017) Event Arrival, Parking Plan B		Difference (No Action PM Peak – Proposed Project Event Arrival)	
		L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
AA (R)	1	64.3	59.0	64.8	60.0	**67.0**	**62.7**	2.2	2.7	**67.3**	**63.2**	0.3	0.5
BB (C)	1	62.9	58.2	64.1	60.0	65.5	61.8	1.4	1.8	65.7	62.0	0.2	0.2
CC (R)	1	**68.0**	**63.4**	**68.2**	**63.7**	**69.2**	**65.1**	1.4	1.9	**69.4**	**65.5**	0.2	0.4
DD (Ch)	1	64.4	59.7	**65.1**	**60.9**	**66.8**	**63.0**	1.7	2.1	**67.0**	**63.3**	0.2	0.3
EE (R)	1	**68.8**	**61.4**	**71.3**	**64.8**	**72.0**	**65.9**	0.7	1.1	**72.0**	**65.9**	0.0	0.0
FF (P)	1	63.4	56.8	64.6	58.4	65.0	59.1	0.4	0.7	**65.1**	59.3	0.1	0.2
State Daytime Noise Standards													
NAC-1	--	65	60	65	60	65	60	--	--	65	60	--	--
NAC-2	--	70	65	70	65	70	65	--	--	70	65	--	--
NAC-3	--	80	75	80	75	80	75	--	--	80	75	--	--

Bold numbers are above State daytime standards.
(R) – Residential; (M) – Medical Services; (C) – Commercial/Business/Office; (Ch) – Church; (I) – Industrial; (P) – Park/Trail; (T) – Transportation
* Noise Area Classification (NAC) associated with each modeled receptor location.

Table 3.9-8. Traffic Noise Analysis Model Results (Weekend) – Receptors A-I

Receptor ID	NAC*	No Action (2017) Event Arrival		Proposed Parking (2017) Event Arrival, Parking Plan B		Difference (Event Arrival, No Action – Proposed Project)		Proposed Project (2017) Event Arrival, Parking Plan B, Park/ Portland Closed		Difference (Event Arrival, No Action – Proposed Project, Park/ Portland Closed)	
		L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
A (C)	2	66.8	60.2	67.2	60.9	0.4	0.7	66.6	60.0	-0.2	-0.2
B (R)	1	**67.4**	**60.7**	**67.8**	**61.4**	0.4	0.7	**67.1**	**60.2**	-0.3	-0.5
C-1 (R)	1	**67.1**	**60.6**	**67.6**	**61.4**	0.5	0.8	**66.8**	60.0	-0.3	-0.6
C-2 (R)	1	**67.0**	**60.6**	**67.5**	**61.4**	0.5	0.8	**66.7**	60.0	-0.3	-0.6
C-3 (R)	1	**66.9**	**60.6**	**67.3**	**61.4**	0.4	0.8	**66.5**	60.0	-0.4	-0.6
C-4 (R)	1	**66.6**	**60.5**	**67.1**	**61.4**	0.5	0.9	**66.3**	59.9	-0.3	-0.6
D (R)	1	**66.5**	**61.0**	**67.3**	**62.3**	0.8	1.3	**65.8**	59.9	-0.7	-1.1
E-1 (R)	1	**67.6**	**60.2**	**68.0**	**60.8**	0.4	0.6	**67.5**	60.0	-0.1	-0.2
E-2 (R)	1	**67.4**	**60.3**	**67.7**	**60.9**	0.3	0.6	**67.2**	**60.1**	-0.2	-0.2
E-3 (R)	1	**67.0**	**60.3**	**67.3**	**60.9**	0.3	0.6	**66.9**	**60.2**	-0.1	-0.1
E-4 (R)	1	**66.6**	**60.3**	**67.0**	**60.9**	0.4	0.6	**66.5**	**60.1**	-0.1	-0.2
E-5 (R)	1	**66.3**	**60.2**	**66.6**	**60.8**	0.3	0.6	**66.1**	**60.1**	-0.2	-0.1
E-6 (R)	1	**65.9**	**60.1**	**66.3**	**60.7**	0.4	0.6	**65.8**	59.9	-0.1	-0.2
F (C)	2	65.8	60.3	66.4	61.3	0.6	1.0	65.7	60.2	-0.1	-0.1
G-1 (R)	1	**69.4**	**62.3**	**69.9**	**63.0**	0.5	0.7	**69.0**	**61.7**	-0.4	-0.6
G-2 (R)	1	**68.9**	**62.1**	**69.4**	**62.8**	0.5	0.7	**68.5**	**61.5**	-0.4	-0.6
G-3 (R)	1	**68.4**	**61.9**	**68.9**	**62.6**	0.5	0.7	**68.0**	**61.2**	-0.4	-0.7
G-4 (R)	1	**67.9**	**61.6**	**68.4**	**62.4**	0.5	0.8	**67.5**	**61.0**	-0.4	-0.6
H (C)	2	60.6	55.5	61.3	56.8	0.7	1.3	60.7	56.0	0.1	0.5
I (C)	2	60.2	55.4	61.4	57.3	1.2	1.9	61.3	57.2	1.1	1.8
State Daytime Noise Standards											
NAC-1	--	65	60	65	60	--	--	65	60	--	--
NAC-2	--	70	65	70	65	--	--	70	65	--	--
NAC-3	--	80	75	80	75	--	--	80	75	--	--

Bold numbers are above State daytime standards.
(R) – Residential; (M) – Medical Services; (C) – Commercial/Business/Office; (Ch) – Church; (I) – Industrial; (P) – Park/Trail; (T) – Transportation
* Noise Area Classification (NAC) associated with each modeled receptor location.

Table 3.9-9. Traffic Noise Analysis Model Results (Weekend) – Receptors J-Z

Receptor ID	NAC*	No Action (2017) Event Arrival		Proposed Project (2017) Event Arrival, Parking Plan B		Difference (Event Arrival, No Action – Proposed Project)		Proposed Project (2017) Event Arrival, Parking Plan B, Park/ Portland Closed		Difference (Event Arrival, No Action – Proposed Project, Park/ Portland Closed)	
		L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
J (R)	1	57.8	54.1	60.0	56.5	2.2	2.4	60.4	56.7	2.6	2.6
K (C)	2	**70.7**	62.7	**71.1**	63.3	0.4	0.6	70.4	62.2	-0.3	-0.5
L-1 (R)	1	**66.9**	**61.4**	**67.5**	**62.2**	0.6	0.8	**67.2**	**61.7**	0.3	0.3
L-2 (R)	1	**66.8**	**61.4**	**67.3**	**62.1**	0.5	0.7	**67.0**	**61.6**	0.2	0.2
M-1 (R)	1	**65.3**	58.4	**66.2**	59.5	0.9	1.1	**66.0**	59.2	0.7	0.8
M-2 (R)	1	**65.2**	58.3	**66.0**	59.4	0.8	1.1	**65.9**	59.1	0.7	0.8
N (C)	2	63.6	58.1	64.3	59.0	0.7	0.9	64.1	58.7	0.5	0.6
O (R)	1	61.9	56.9	64.4	59.7	2.5	2.8	62.8	57.4	0.9	0.5
P (P)	1	61.1	51.9	**66.9**	58.7	5.8	6.8	**68.1**	**60.2**	7.0	8.3
Q (I)	3	65.0	57.5	66.6	60.0	1.6	2.5	66.9	60.4	1.9	2.9
R (C)	2	64.5	57.6	65.9	59.6	1.4	2.0	65.8	59.4	1.3	1.8
S (C)	2	62.7	55.9	63.9	57.5	1.2	1.6	62.0	57.9	-0.7	2.0
T (T)	2	59.1	55.2	61.0	57.6	1.9	2.4	58.2	55.1	-0.9	-0.1
U (C)	2	68.7	62.5	69.8	64.1	1.1	1.6	**70.2**	64.6	1.5	2.1
V (C)	2	60.6	56.0	62.6	58.5	2.0	2.5	60.8	56.3	0.2	0.3
W (M)	1	63.0	57.8	64.6	**60.1**	1.6	2.3	64.0	59.1	1.0	1.3
X (C)	2	61.7	54.5	62.6	56.1	0.9	1.6	61.4	54.9	-0.3	0.4
Y (C)	2	67.1	60.5	67.9	61.6	0.8	1.1	67.6	61.2	0.5	0.7
Z (R)	1	**66.5**	**60.1**	**67.2**	**61.1**	0.7	1.0	**66.9**	**60.7**	0.4	0.6
State Daytime Noise Standards											
NAC-1	--	65	60	65	60	--	--	65	60	--	--
NAC-2	--	70	65	70	65	--	--	70	65	--	--
NAC-3	--	80	75	80	75	--	--	80	75	--	--

Bold numbers are above State daytime standards.
(R) – Residential; (M) – Medical Services; (C) – Commercial/Business/Office; (Ch) – Church; (I) – Industrial; (P) – Park/Trail; (T) – Transportation
* Noise Area Classification (NAC) associated with each modeled receptor location.

Table 3.9-10. Traffic Noise Analysis Model Results (Weekend) – Receptors AA-FF

Receptor ID	NAC*	No Action (2017) Event Arrival		Proposed Project (2017) Event Arrival, Parking Plan B		Difference (Event Arrival, No Action – Proposed Project)		Proposed Project (2017) Event Arrival, Parking Plan B, Park/ Portland Closed		Difference (Event Arrival, No Action – Proposed Project, Park/ Portland Closed)	
		L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
AA (R)	1	63.8	58.5	64.6	59.7	0.8	1.2	64.4	59.4	0.6	0.9
BB (C)	1	61.7	56.8	62.6	58.1	0.9	1.3	62.3	57.6	0.6	0.8
CC (R)	1	**66.1**	**61.1**	**66.6**	**62.0**	0.5	0.9	**66.7**	**62.0**	0.6	0.9
DD (Ch)	1	63.1	58.0	63.8	59.0	0.7	1.0	63.6	58.7	0.5	0.7
EE (R)	1	**65.8**	57.9	**66.6**	59.0	0.8	1.1	**66.5**	58.9	0.7	1.0
FF (P)	1	57.7	50.1	58.3	51.2	0.6	1.1	58.2	51.0	0.5	0.9
State Daytime Noise Standards											
NAC-1	--	65	60	65	60	--	--	65	60	--	--
NAC-2	--	70	65	70	65	--	--	70	65	--	--
NAC-3	--	80	75	80	75	--	--	80	75	--	--

Bold numbers are above State daytime standards.
(R) – Residential; (M) – Medical Services; (C) – Commercial/Business/Office; (Ch) – Church; (I) – Industrial; (P) – Park/Trail; (T) – Transportation
* Noise Area Classification (NAC) associated with each modeled receptor location.

Noise Model Results (Weekend)

Future (2017) daytime modeled noise levels under the Proposed Project (weekend event arrival period) are predicted to range from 58.3 dBA (L_{10}) to 71.1 dBA (L_{10}). In general, modeled daytime traffic noise levels are predicted to increase by 0.3 dBA (L_{10}) to 2.5 dBA (L_{10}) compared to the No Action Alternative with weekday event arrival traffic. Modeled traffic noise levels at Receptor P, representing the Hiawatha Trail along 3rd Street south of Norm McGrew Place, are projected to increase by 5.8 dBA (L_{10}) because of the increase in traffic volumes on 3rd Street under the Proposed Project.

Modeled traffic noise levels are predicted to exceed State daytime L_{10} and L_{50} standards at 20 modeled receptor locations under the Proposed Project during the weekday event arrival period. Modeled noise levels are projected to exceed State daytime L_{10} standards only at five modeled receptor locations (Receptor K, Receptor M-1, Receptor M-2, Receptor P, and Receptor EE) under the Proposed Project, whereas modeled noise levels are projected to exceed State daytime L_{50} standards only at one modeled receptor location (Receptor W) under the Proposed Project. Modeled noise levels at the remaining 20 receptor locations are projected to be below applicable State daytime L_{10} and L_{50} standards.

Future (2017) daytime modeled noise levels with the Proposed Project (weekend event arrival period, Park and Portland Avenues closed) are predicted to range from 58.2 dBA (L_{10}) to 70.4 dBA (L_{10}). In general, modeled daytime traffic noise levels are predicted to increase by up to 2.6 dBA (L_{10}) compared to the No Action Alternative with weekday event arrival traffic; however, modeled traffic noise levels at receptor locations along Washington Avenue are projected to experience small decreases in traffic noise levels (less than 1.0 dBA, L_{10}) as some traffic shifts to other roadways. Modeled traffic noise levels at Receptor P are projected to increase 7.0 dBA (L_{10}) compared to the No Action Alternative because of the increase in traffic volumes on 3rd Street under the Proposed Project.

Modeled traffic noise levels are predicted to exceed State daytime L_{10} and L_{50} standards at 14 modeled receptor locations under the Proposed Project during the weekend event arrival period with closure of Park Avenue and Portland Avenue. Modeled noise levels are projected to exceed State daytime L_{10} standards only at 11 modeled receptor locations. Modeled noise levels at the remaining 20 receptor locations are projected to be below applicable State daytime L_{10} and L_{50} standards.

3.9.2.4 Mitigation

Construction of the Proposed Project would result in increases in traffic noise of less than 3.0 dBA at most all modeled receptor locations compared to the No Action Alternative with event arrival traffic. Under the Proposed Project scenario with closure of Park and Portland Avenues, some receptor locations are projected to experience a decrease in sound levels of less than 1 dBA (L_{10}) compared to the No Action Alternative. A change in sound levels of 3 dBA is barely noticeable by the human ear. Therefore, the change in traffic noise levels under the Proposed Project is not anticipated to be readily perceptible.

Modeled noise levels would exceed State daytime standards at nearly two-thirds of the modeled receptor locations under the Proposed Project during the weekday event arrival scenario. During the weekend event arrival scenario, just over half of the modeled receptor locations would exceed State daytime standards with the Proposed Project. As described in Section 3.9.2.2, modeled traffic noise levels currently exceed State daytime noise standards at more than half of the modeled receptor locations. Traffic noise levels at nearly two-thirds of the modeled receptor locations are projected to exceed State daytime standards under the future No Action Alternative.

Construction of noise barriers along city streets in downtown Minneapolis to reduce traffic noise levels is not feasible or reasonable because of the proximity of roadways, sidewalks, and buildings to one another. Travel demand strategies that reduce Proposed Project related traffic volumes could

also reduce related traffic noise levels. As previously described, a change in sound levels of 3 dBA is barely noticeable by the human ear. A doubling (or halving) of sound energy (i.e., the amount of traffic is doubled or is reduced by one-half) results in a 3 dBA change in sound levels. As such, the reduction in traffic volumes with any travel demand strategy would have to be substantial for any decrease in traffic noise levels to be perceptible.

3.9.2.5 No Action Alternative

With the No Action Alternative, traffic patterns around the Metrodome site would be expected to remain at current levels. Increases in traffic noise levels would be expected at modeled receptor locations as a result of background traffic growth. Traffic noise analysis results under the No Action Alternative are summarized below.

No Action Alternative (Weekday)

Future (2017) daytime modeled noise levels under the No Action Alternative (PM peak hour) are predicted to range from 63.9 dBA (L_{10}) to 76.4 dBA (L_{10}). Modeled daytime traffic noise levels are predicted to increase by 0.2 dBA (L_{10}) to 2.5 dBA (L_{10}) under the No Action Alternative compared to existing conditions. This increase is the result of forecast traffic growth in downtown Minneapolis. Modeled traffic noise levels are predicted to exceed State daytime L_{10} and L_{50} standards at 30 modeled receptor locations under the No Action Alternative. Modeled noise levels are projected to exceed State daytime L_{50} standards only at one residential receptor location (Receptor J), while modeled noise levels at remaining receptor locations are below applicable State daytime L_{10} and L_{50} standards.

Future (2017) daytime modeled noise levels under the No Action Alternative (weekday event arrival period) are predicted to range from 63.7 dBA (L_{10}) to 77.3 dBA (L_{10}). Modeled daytime traffic noise levels are predicted to increase by up to 2.7 dBA (L_{10}) compared to No Action Alternative PM peak hour conditions. However, some modeled receptor locations surrounding the existing Metrodome site are projected to experience a decrease in modeled traffic noise levels of up to 3.0 dBA (L_{10}) under the No Action Alternative with weekday event arrival traffic because of roadway closures during events.

Modeled traffic noise levels are predicted to exceed State daytime L_{10} and L_{50} standards at 31 modeled receptor locations under the No Action Alternative during the weekday event arrival period. Modeled noise levels are projected to exceed State daytime L_{50} standards only at one residential receptor location (Receptor J), and are predicted to exceed State daytime L_{10} standards only at two modeled receptor locations (Receptor R and Receptor Y). Modeled noise levels at the remaining 11 receptor locations are projected to be below applicable State daytime L_{10} and L_{50} standards.

No Action Alternative (Weekend)

Future (2017) daytime modeled noise levels under the No Action Alternative (weekend event arrival period) are predicted to range from 57.7 dBA (L_{10}) to 70.7 dBA (L_{10}). Modeled traffic noise levels are predicted to exceed State daytime L_{10} and L_{50} standards at 20 modeled receptor locations under the No Action Alternative during weekend event arrival periods. Modeled noise levels are projected to exceed State daytime L_{10} standards only at four modeled receptor locations (Receptor K, Receptor M-1, Receptor M-2, and Receptor EE). Modeled noise levels at the remaining 21 receptor locations are projected to be below applicable State daytime L_{10} and L_{50} standards.

3.9.2.6 Potential Impacts Associated with the Use of TCF Bank Stadium

No additional traffic noise analysis was completed as part of the Proposed Project with the use of TCF Bank Stadium. The *University of Minnesota On-Campus Football Stadium Final EIS* (February 2006) discuss the traffic noise impacts to adjacent properties during TCF Bank Stadium events. Roadways leading to University of Minnesota parking have a certain amount of capacity for which

traffic can move under free-flow conditions. As traffic volumes increase leading up to an event at TCF Bank Stadium, the amount of traffic would eventually exceed the roadway capacity, creating congested conditions and lower traffic speeds. Highway traffic noise levels are typically the greatest when traffic is free-flowing and at or near a level of service C condition.

From a traffic volume perspective, the impacts from the use of TCF Bank Stadium by the Vikings will be similar to the impacts documented in the *University of Minnesota On-Campus Football Stadium EIS*. Additional vehicle traffic on the University of Minnesota Campuses is not expected. Therefore, traffic noise levels due to the use of the TCF Bank Stadium for NFL events would be expected to be similar to that of a capacity University of Minnesota football game.

3.9.3 Event Noise Analysis

3.9.3.1 Affected Environment

The existing noise environment in the Proposed Project area is dominated by vehicular traffic on adjacent roadways. Hiawatha LRT operations and commercial facilities also contribute to the noise environment. Noise levels in the Proposed Project area vary and are generally relative to proximity to these sources.

The area surrounding the Stadium site is predominately business/commercial. The closest noise-sensitive areas (NSAs) to the Stadium site were identified during the field reconnaissance; the locations of these NSAs, most of which are residential land uses, are shown in **Figure 3.9-2**. For purposes of this analysis, the Hennepin County Medical Examiner/Sheriff's Office building is considered a commercial land use.

Sound Level Measurements

A series of sound level measurements was performed at representative locations to quantify the ambient noise environment in the Proposed Project area. The measurements were performed between November 4, 2012 and November 8, 2012. The measurements were performed on a Sunday, Monday, or Thursday, at times of day that a football game is typically played.

A Larson Davis Model 720 American National Standards Institute (ANSI) Type 2 Integrating Sound Level Meter (SLM) was used as the data-collection device. The meter was mounted on a tripod roughly five feet above ground to simulate the average height of the human ear. The meter was calibrated before and after the measurement period. The measured ambient sound levels are summarized in **Table 3.9-11**. The sound levels ranged from approximately 60 dBA L_{10} to 66 dBA L_{10} and 55 dBA L_{50} to 60 dBA L_{50}. Sources contributing to the ambient noise environment during the measurement periods included vehicular traffic, wind in vegetation, distant railroad noise, and a cooling tower (at monitor location ML2 only).

Table 3.9-11. Measured Ambient Sound Levels

Measurement Location*	Date	Time	L_{10} (dBA)	L_{50} (dBA)
ML1	November 4, 2012	12:05 PM – 1:05 PM	63.0	58.4
	November 5, 2012	7:05 PM – 8:05 PM	62.5	54.9
ML2	November 4, 2012	1:20 PM – 2:20 PM	63.5	57.3
	November 5, 2012	8:15 PM – 9:15 PM	62.5	58.5
ML3	November 4, 2012	2:35 PM – 3:35 PM	63.7	57.3
	November 8, 2012	7:05 PM – 8:05 PM	65.8	60.3
ML4	November 8, 2012	8:10 PM – 9:10 PM	64.3	58.3
ML5	November 8, 2012	9:20 PM – 10:05 PM	59.6	54.7

* See **Figure 3.9-2** for noise measurement locations referenced in table.

Project Noise Assessment

Events associated with the Proposed Project would generate noise from three areas: the new Stadium, the tailgating areas, and the plaza. The Stadium noise would consist of attendee activities and public address (PA) system usage. The tailgating noise would consist of attendee activities that may include amplified music. The plaza noise may consist of radio station trucks or other amplified music.

- Stadium Noise

Stadium noise is characterized by relatively low noise levels associated with conversational speech and movement among the crowd, punctuated by sporadic high noise levels associated with PA announcements, introductory or celebratory music, and crowd reactions. Because of the intermittent nature of this noise source, the appropriate metric for determination of compliance is the L_{10}, the noise level exceeded 10 percent of the time. In addition, events would normally occur during daytime hours (7:00 AM to 10:00 PM) only; therefore, the noise level at the NSAs potentially impacted by the Proposed Project were evaluated with respect to the daytime noise level limit of 65 dBA L_{10} at residential uses and 70 dBA L_{10} at commercial uses. Games could occasionally extend into the nighttime period (10:00 PM to 7:00 AM); however, this is expected to be an infrequent occurrence and was not analyzed.

To appropriately predict the L_{10} generated by the new Stadium, the average sound level in the stands during high noise generation periods was used in the model. Noise levels during this condition at other stadiums (e.g., Oriole Park at Camden Yards [Baltimore, MD], Jacobs Field [Cleveland, OH], and Ameriquest Field [Arlington, TX] [WJHW 2006: Ballpark Stadium Noise Levels]) were measured at 85-90 dBA; noise levels at the new Stadium during football games is expected to be similar. The average L_{10} associated with the new Stadium was assumed to be 88 dBA. This noise level includes patron noise and PA system noise. As a detailed speaker placement plan has not been developed for the Proposed Project, the noise analysis assumed PA speakers would be distributed evenly through the new Stadium.

- Tailgating

Tailgating may occur at locations in the area bounded by 4th Avenue on the west, 11th Avenue on the east, 6th Street on the south, and the riverbank on the north (Minneapolis City Code § 319.310(c)). A series of measurements was conducted during tailgating in the parking lot bounded by 3rd Street, 4th Street, 5th Avenue, and Portland Avenue on the morning of Sunday, November 11, 2012. The measurements indicated that tailgating activities generally produce an average in-tailgating-area noise level of approximately 87 dBA L_{10}.

- Plaza

Events on the plaza may include amplified music. It was assumed that plaza events would include multiple noise generation sources and a high density of Stadium patrons preparing for the event, and thus produce noise levels similar to tailgating activities.

- Modeling

The Datakustik CadnaA Noise Prediction Model was used to estimate the Proposed Project-generated sound levels. CadnaA predicts and assesses noise levels for a variety of noise sources. The model uses industry-accepted propagation algorithms and accepts sound power levels (in decibels re: 1 picoWatt) based on ISO 9613-2 standards. ISO 9613-2 is an internationally recognized standard that establishes a method for calculating the attenuation of outdoor sound propagation, in order to predict the levels of environmental noise at a distance from a variety of sources. The calculations account for classical sound wave divergence, plus attenuation factors resulting from air absorption and basic ground effects. Shielding afforded by nearby buildings was

not incorporated into the model; as such, the model presents a worst-case condition. Air absorption was determined using "standard day" conditions (59°F, 70% relative humidity, no wind effects).

The Stadium configuration was imported into CadnaA from computer-aided design (CAD) files of draft design plans. The noise attenuating effects from the new Stadium walls, decks, and other structures were modeled. In the interest of a worst-case scenario, it was assumed that the roof and door options (east and west) were operable and open. The total Stadium capacity was modeled in seats according to the seating reference plan. Seating areas were modeled as area sources comprised of the appropriate number of individual patrons with a sound power level of 88 dBA each; this approach results in an average in-stand L_{10} of 88 dBA. The calculated noise contours produced by the new Stadium are shown in five-decibel increments on **Figure 3.9-3**. The contours represent the sound pressure level in dBA L_{10} at a height of five feet above ground.

Project noise levels were also evaluated at specific NSAs closest to the Proposed Project. These buildings are multi-story structures; due to the assumed operable roof of the new Stadium, noise attenuation from the new Stadium structure would be less effective at higher elevations above the ground. Therefore, the noise level at each NSA was predicted at the assumed top-floor elevation of the building. Stadium use would generate noise levels as shown in **Table 3.9-12**. The Proposed Project would generate Stadium noise levels ranging from approximately 46 dBA L_{10} at monitor location ML1 to 75 dBA L_{10} at NSA6. These noise levels are from the Proposed Project only and are not composite sound levels including the ambient noise in the area. Refer to **Figure 3.9-3** and **Table 3.9-11** for further details.

Tailgating activities would generate noise levels up to 65 dBA L_{10} at approximately 235 feet from the edge of the parking lot and 70 dBA L_{10} at approximately 110 feet.

Plaza events would generate noise levels as shown in **Table 3.9-12**. The Proposed Project would result in plaza noise levels ranging from 43 dBA L_{10} at ML5 to 73 dBA L_{10} at NSA6.

Table 3.9-12. Proposed Project-Generated Event Noise Levels

Noise-Sensitive Area	Land Use	Distance/ Direction*	Impact Threshold	Ambient Noise Level	Stadium-Generated Noise Level	Plaza-Generated Noise Level	Impact?
ML1	Residential	1,500 feet SE	65 dBA L_{10}	63 dBA L_{10}	55 dBA L_{10}	48 dBA L_{10}	No
ML2	Residential	950 feet S	65 dBA L_{10}	64 dBA L_{10}	54 dBA L_{10}	62 dBA L_{10}	No
ML3	Residential	1,625 feet NNW	65 dBA L_{10}	65 dBA L_{10}	64 dBA L_{10}	58 dBA L_{10}	No
ML4	Residential	1,675 feet WNW	65 dBA L_{10}	64 dBA L_{10}	46 dBA L_{10}	56 dBA L_{10}	No
ML5	Recreational	525 feet NE	65 dBA L_{10}	60 dBA L_{10}	56 dBA L_{10}	43 dBA L_{10}	No
NSA6	Medical	750 feet SW	70 dBA L_{10}	-	75 dBA L_{10}	73 dBA L_{10}	Yes (Stadium)
NSA7	Residential	2,000 feet E	65 dBA L_{10}	-	60 dBA L_{10}	45 dBA L_{10}	No
NSA8	Residential	900 feet N	65 dBA L_{10}	-	51 dBA L_{10}	60 dBA L_{10}	No

* Distance and direction are approximate and are relative to the center of the new Stadium.

3.9.3.2 Environmental Consequences

Under Minnesota Rules, new Stadium events would result in an impact if daytime noise levels exceed 65 dBA L_{10} at residential land uses or 70 dBA L_{10} at commercial land uses.

At NSA6, without mitigation, sound levels from new Stadium events and plaza activity would exceed the 70 dBA L_{10} daytime sound level limit at a commercial land use. At all other NSAs, without mitigation, sound levels from new Stadium events would not exceed the 65 dBA L_{10} daytime sound level limit at residential land uses.

Without mitigation, tailgating within 235 feet of a residential structure would exceed the 65 dBA L_{10} daytime sound level limit. Without mitigation, tailgating within 110 feet of a commercial structure would exceed the 70 dBA L_{10} daytime sound level limit.

Sound levels from plaza events would not exceed the 65 dBA L_{10} daytime sound level limit for residential land uses.

3.9.3.3 Mitigation

Proposed event noise mitigation measures could include:

- Stadium design elements that work to block the line of sight between the open western doors and the eastern stands
- Requiring amplified music speakers in the plaza area be located 110 feet or more from NSA6 and oriented away from NSA6
- Restricting tailgating areas to distances beyond 235 feet from residential structures and beyond 110 feet from commercial structures
- Restricting the sound level of amplified music in tailgating areas

3.9.3.4 No Action Alternative

In the No Action Alternative, Metrodome events and tailgating activities would continue to occur as planned. The plaza would not exist as planned; therefore, events at that plaza would not occur. Under the assumption that Metrodome events and tailgating activities currently comply with the requirements of the Minnesota Rules, there are no adverse event noise impacts associated with the No Action Alternative.

3.10 Nearby Resources: Archaeological, Historical, or Architectural Resources

3.10.1 Affected Environment

The Proposed Project site is located within the Downtown East neighborhood in Minneapolis. The Downtown East neighborhood is bounded by the Mississippi River to the north, by Portland Avenue on the west, by Interstate 35W on the east, and by 5th Street on the south. The Downtown East neighborhood has a vibrant mix of structures and uses, including parks and riverfront, the existing Metrodome, the Guthrie Theater, the Mill City Museum, historic buildings including old mills and factories, residences, and commercial and industrial uses.

There are no locally or nationally recognized historic districts or architectural resources identified within the Proposed Project area. There are two historic districts within ½ mile of the new Stadium site: The Saint Anthony Falls Historic District and the South Ninth Street Historic District. There are four buildings within a block of the project site and proposed plaza that are listed on the National Register of Historic Places (NRHP): the Minneapolis Armory, the Advance Thresher/Emerson-Newton Company, the Northern Implement Company, and the Grain Exchange Building. Two other

NRHP-listed properties (the Minneapolis City Hall and the Flour Exchange Building) are over a block away from the proposed plaza (**see Figure 3.10-1**).

3.10.1.1 Historic Districts

The Saint Anthony Falls Historic District includes the buildings that were once a part of the milling and trade center along the Mississippi riverfront and celebrates the milling history of the city of Minneapolis, the nation's most important milling complex during its peak. The district lies two blocks north of the new Stadium site and is generally bounded by Plymouth Avenue, 2nd Street, 10th Avenue, 6th Avenue, and University Avenue. The Saint Anthony Falls Historic District includes portions of the following Minneapolis neighborhoods: North Loop, Downtown West, Downtown East, Marcy Holmes, Nicollet Island/East Bank, and St. Anthony West.

The South Ninth Street Historic District includes a number of multiple-family dwellings from the turn of the century and is one of the best and most-cohesive collections of multiple-family dwellings within the city. The district, located within the Elliot Park neighborhood, is generally located along 9th and 10th Streets between the intersections of Park Avenue and 5th Avenue; the district also extends south to include properties along East 14th and East 16th Streets. Located southeast of the downtown core, this area continues to serve as an important transition zone between the high density business district of downtown and the lower density residential districts surrounding the city.

3.10.1.2 Historic Buildings

The Minneapolis Armory building was designed by St. Paul architect P.C. Bettenburg and was built as part of a Public Works Administration (PWA) grant. The PWA Moderne style structure was built for the Minnesota National Guard in 1935-6 and housed their operations until 1980. Since then, the structure has been used for concerts, civic events, sports tournaments, production of music videos, and most recently an indoor parking facility. It was listed on the NRHP in 1985.

The Advance Thresher/Emerson-Newton Company property was designed by architects Kees and Colburn in the Chicago Commercial style and is located at 700-08 3rd Street South. The property is comprised of two adjoining buildings built in 1900 and 1904, respectively, and was listed on the NRHP in 1977. The five and six story structures were originally designed as manufacturing facilities and today house commercial uses.

The Northern Implement Company building was also designed by architects Kees and Colburn in the Chicago Commercial style and is located at 616 3rd Street South. Built in 1910, the structure was originally designed for production and retail purposes. Today, the seven story building houses commercial uses. It was listed on the NRHP in 1977.

The Grain Exchange Building was also designed by architects Kees and Colburn in the Chicago Commercial style and is located at 400-412 4th Street South. It was built in 1900-1902 to house the growing demands of the Minneapolis Grain Exchange. Today, it houses a variety of office tenants in addition to the Minneapolis Grain Exchange. It was listed on the NRHP in 1977.

3.10.1.3 Area Master Plans

The Proposed Project site falls within the guidance of the Downtown East/North Loop Master Plan, prepared by the Minneapolis CPED/Planning Division and IBI Group, and approved by the Minneapolis City Council in October 2003. The master plan identified the Metrodome site under Development Precinct Six and suggested that the Metrodome site would either remain viable and active, with redevelopment opportunities surrounding it, or it would become obsolete and be redeveloped with high-density mixed-use if an alternate site were selected for a new football stadium.

A small area plan is currently underway to update the Downtown East/North Loop Master Plan and will reflect the proposed new Stadium on the Proposed Project site.

3.10.1.4 Archaeological Resources

There are no known archaeological sites identified within the Proposed Project area. In their review of the Scoping EAW/Draft SDD, the State Historic Preservation Office stated, "Due to the nature and location of the proposed project, we believe it is unlikely that any intact archaeological sites remain. Therefore, no archaeological survey work is requested, and we believe that the proposed project will have no effect on archaeological resources."

3.10.2 Environmental Consequences

None of the designated historic districts or NRHP-listed landmarks identified above are located within the Proposed Project area, and therefore, no direct impacts to those historic resources are expected.

Potential indirect impacts to the identified properties, including impacts on visual settings, traffic patterns, and noise, are discussed below.

3.10.2.1 Visual Settings

As discussed in Section 3.12, the height and massing of the Proposed Project would be larger than the height and massing of the Metrodome. The Proposed Project will be surrounded by existing multi-story buildings as the Metrodome is today. The proposed materials and design for the Proposed Project's new Stadium is a departure from the existing billowed, cushion roof and concrete bowl of the Metrodome. However, the primary proposed materials (steel and glass) would provide a greater visual connection from the surrounding area to the new Stadium (and from the new Stadium to the surrounding area) and would respond to the design guidelines in the Downtown East/North Loop Master Plan that seek greater connectivity between "a single enormous structure and a series of finer-grain neighborhoods that surround it."

The views of the new Stadium site to and from the St. Anthony Falls Historic District and the South Ninth Street Historic District are limited and are partially obscured by existing multi-story buildings. Partial views of the Metrodome may be seen between buildings, from streets, and from upper level floors of some buildings. In general, only the top of the Metrodome or a narrow section of the building can be seen in some locations. Views of the Proposed Project's new Stadium will be similarly obscured, but the roof line will be more visible because the new Stadium peak will be approximately 100 feet higher (at its highest point) than the Metrodome roof line.

The proposed construction of a park (Reserved Parking Plan A) or a parking structure (Reserved Parking Plan B) on the northwest corner of the new Stadium site would change the views to and from the Advance Thresher/Emerson-Newton Company and Northern Implement Company properties. Under the No Action Alternative, the view to the southeast from these properties is of surface parking lots, with some landscaping, a small commercial building, and the Metrodome.

Construction of a park on the McClellan Block would provide a public realm connection and view corridor to the Stadium site from areas to the northwest, including the Advance Thresher/Emerson-Newton Company and Northern Implement Company properties, and to the southwest, including the Minneapolis Armory. Construction of a parking structure on the McClellan Block would partially obscure the view of the new Stadium from Advance Thresher/Emerson-Newton Company and Northern Implement Company properties, obscure views of these historic buildings from the southeast, and change the form in the vicinity of the historic buildings to a sidewalk-fronting urban scale structure, a form that would also be carried east on 3rd Street by the proposed parking structure on the McGrew Block between 4th Street and 5th Street. This structure would also change the view to and from the Grain Exchange Building.

The proposed construction of a plaza/park space east of 5th Avenue would change the view to and from the Northern Implement Company building. Under the No Action Alternative, the view to the

southeast is of a surface parking lot and, at a block-plus distance, the Metrodome. The proposed plaza/park space would provide a public realm connection and view corridor to the Stadium site from areas to the west, including the site of the Grain Exchange Building and the Minneapolis Armory. See Section 3.12 for further discussion of visual impacts.

3.10.2.2 Traffic Impacts

No significant changes in traffic are expected to occur in the St. Anthony Falls Historic District (southern boundary is 2nd Street) or the South Ninth Street Historic District (northern boundary is 9th Street). Both historic districts currently experience increased traffic during events at the existing Metrodome and increased event parking. These impacts are expected to continue with the Proposed Project. Vehicular traffic is expected to increase before and after events due to the expanded seating capacity of the new Stadium. A permanent road closure of 5th Street between 11th Avenue and Chicago Avenue or Park Avenue is proposed as part of the Proposed Project. Park Avenue and Portland Avenue may also be temporarily closed during the weekend event arrival period. These permanent and temporary changes to the roadway network will result in both long-term and short-term changes in traffic patterns in downtown Minneapolis. Traffic management strategies, such as traffic control agents and event signal timing plans, would be implemented during events to manage increased traffic levels surrounding the new Stadium. For additional discussion of traffic impacts, parking, transit, and event traffic management, refer to Section 3.7.

The permanent closure of 5th Street adjacent to the new Stadium may result in decreased traffic on 5th Street adjacent to the Minneapolis Armory, compared to the No Action conditions; however, 5th Street adjacent to the Armory would remain open, and access to the property would not be expected to be impacted. Traffic on the roadways adjacent to the Minneapolis Armory would be expected to increase by up to 70 to 85 percent during event arrival and up to 25 to 35 percent during the event departure for the Proposed Project Weekend Event scenario, compared to the No Action Weekend Event scenario. However, the event arrival and departure peak hour traffic volumes would still be expected to be less than the current weekday AM and PM peak hour traffic on the roadways adjacent to the Armory, except for 6th Street in the arrival peak hour and 6th Street and Portland Avenue in the departure peak hour. The traffic on these roadways are anticipated to increase by up to 20 to 35 percent, compared to current weekday AM and PM peak hour traffic. During event arrival for the Proposed Project Weekday Event scenario, traffic would be expected to increase by up to five to 10 percent compared to the No Action Weekday Event arrival volumes. Event traffic volumes on Portland Avenue adjacent to the Minneapolis Armory would be expected to be reduced by up to 100 percent if the Park Avenue/Portland Avenue temporary closure was implemented, compared to No Action Weekend event conditions, whereas traffic volumes on 5th Avenue and 6th Street would be expected to increase by up to 95 percent.

The permanent closure of 5th Street adjacent to the new Stadium may result in increased traffic volumes by up to five to 15 percent on Washington Avenue and Portland Avenue adjacent to the Advance Thresher/Emerson-Newton Company and Northern Implement Company properties, compared to the No Action conditions; however, access to the properties would not be expected to be impacted. Traffic on the roadways adjacent to the Advance Thresher/Emerson-Newton Company and Northern Implement Company properties would be expected to increase by up to 20 to 35 percent during event arrival and by up to 15 to 55 percent during the event departure for the Proposed Project Weekend Event scenario, compared to the No Action Weekend Event scenario. However, the Proposed Project Weekend Event arrival and departure peak hour traffic volumes would still be expected to be less than the current weekday AM and PM peak hour traffic, except for Washington Avenue in the arrival peak hour and Washington Avenue, 3rd Street, and Park Avenue in the departure peak hour. The traffic on these roadways are anticipated to increase by up to five to 80 percent, compared to current weekday AM and PM peak hour traffic. During event arrival for the Proposed Project Weekday Event scenario, traffic would be expected to increase by up to five to 10 percent compared to the No Action Weekday Event arrival volumes. Event arrival traffic on the

adjacent roadways would be expected to increase by up to 15 to 25 percent if the Park Avenue/Portland Avenue temporary closure was implemented, compared to No Action Weekend event conditions.

The permanent closure of 5th Street adjacent to the new Stadium is not expected to impact traffic on the roadways adjacent to the Grain Exchange Building, compared to the No Action conditions. Traffic on the roadways adjacent to the Grain Exchange Building would be expected to increase by up to 15 to 45 percent during event arrival and by up to 50 to 65 percent during the event departure for the Proposed Project Weekend Event scenario, compared to the No Action Weekend Event scenario. However, the Proposed Project Weekend Event arrival and departure peak hour traffic volumes would still be expected to be less than the current weekday AM and PM peak hour traffic, except for 4th Street and 4th Avenue in the arrival peak hour and 3rd Street in the PM peak hour. The traffic on these roadways is anticipated to increase by up to one to 80 percent, compared to current weekday AM and PM peak hour traffic. During event arrival for the Proposed Project Weekday Event scenario, traffic would be expected to increase by zero to 10 percent compared to the No Action Weekday Event arrival volumes. Event arrival traffic on the adjacent roadways would be expected to increase by up to 15 to 40 percent if the Park Avenue/Portland Avenue temporary closure was implemented, compared to No Action Weekend event conditions.

The traffic increases and decreases on roadways adjacent to the historic or potentially historic properties, as described in this section, still result in traffic volumes that are generally less than the existing weekday peak hour volumes on these roadways. In addition, the event traffic volumes are temporary in nature and are expected to occur on less than 16 days per year and will be managed through transportation mitigation strategies. Therefore, the expected traffic changes are not considered to be significant impacts.

3.10.2.3 Noise Impacts

Modeled noise levels would exceed State daytime standards at the Armory under the Proposed Project during the 2017 weekday event arrival scenario. Modeled noise levels would also be exceeded at the Armory under the Proposed Project during the 2017 weekend event arrival scenario if Park/Portland Avenues are closed. Modeled noise levels would increase at the Minneapolis Armory by a level ranging from 0.4 to 1.5 dBA compared to No Action conditions, depending on the Proposed Project scenario. Typically, a change in sound levels of 3 dBA is barely noticeable by the human ear. Therefore, the change in traffic noise levels at the Armory under the Proposed Project is not anticipated to be readily perceptible. Construction of noise barriers along city streets in downtown Minneapolis to reduce traffic noise levels is not feasible or reasonable because of the proximity of roadways, sidewalks, and buildings to one another.

It is not anticipated that any other properties listed on the NRHP will experience noise-related impacts due to the Proposed Project.

3.10.2.4 Economic Impacts

The primary uses in the St. Anthony Falls Historic District and the South Ninth Street Historic District are residential, office, entertainment, restaurants, and some limited retail. The primary uses in the historic buildings immediately adjacent to the Stadium site are office. Given there is an existing stadium on the Stadium site, the changes in visual setting, traffic, and noise resulting from the Proposed Project are not anticipated to negatively affect the economic viability of the identified historic districts and structures. There may be positive economic effects on the historic districts and structures as a result of construction and operation of the new Stadium including increased property values, increased residential development, and increased restaurant, entertainment, and retail activity. Construction and Stadium jobs will be available to residents living in nearby neighborhoods.

During construction, there will be additional traffic, congestion, and detours caused by the construction of the new Stadium and the related infrastructure, proposed plaza, and streetscape improvements. However, these impacts are not expected to impact the office uses in the adjacent historic structures. The two historic districts are several blocks from the Stadium site, and therefore, limited economic impacts are expected during construction.

Ultimately, the potential long-term economic benefits will likely benefit the integrity and visibility of both historic districts.

3.10.3 Mitigation

Mitigation measures associated with traffic impacts are documented in the traffic section (see Section 3.7). Mitigation measures to minimize or avoid short-term construction related economic impacts will include construction communications (website, news releases, and signage as appropriate) to direct customers to area businesses and advise neighborhood residents of construction activities. The MSFA will discuss potential mitigation measures related to visual impacts with the City of Minneapolis.

3.10.4 No Action Alternative

The No Action Alternative would not result in any changes to the visual setting, traffic patterns, noise, economic viability, or other impacts to nearby historic resources.

3.11 Nearby Resources: Parkland, Recreation Areas, or Trails

For discussion of pedestrian and bicycle trails, see Sections 3.7.3.1 and 3.7.3.2, respectively.

3.11.1 Parkland and Recreation Areas

3.11.1.1 Affected Environment

There are no parklands or recreation areas within the Proposed Project area. The nearest parks are Gold Medal Park, two blocks north of the Stadium site, and Elliot Park, two blocks south of the Stadium site.

3.11.1.2 Environmental Consequences

The Proposed Project is not expected to affect the use or operation of Gold Medal Park or Elliot Park. Potential temporary disruptions to trails or sidewalks that would be used to access the park facilities are discussed in Sections 3.7.3.1 and 3.7.3.2.

3.11.1.3 Mitigation

No adverse effects on parklands or recreation areas have been identified; therefore, no mitigation measures are proposed.

3.11.1.4 No Action Alternative

No changes to surrounding parklands or recreation areas would occur with the No Action Alternative.

3.12 Visual Impacts

3.12.1 Stadium Structure

3.12.1.1 Affected Environment

The physical setting of the new Stadium is on the existing site of the Metrodome and lies within the Downtown East Neighborhood. The Stadium site is on the eastern edge of downtown Minneapolis, generally from 3rd Street to 6th Street and from Park Avenue to 11th Avenue. The immediate surroundings of the Stadium site consist of a mix of surface parking lots and low-rise structures that range in height from one to ten stories (see **Figure 3.12-1**). The downtown core of Minneapolis, identifiable by its many high-rise structures, begins a few blocks west of the Stadium site.

3.12.2 Environmental Consequences

Draft design plans reveal that the new Stadium would be a bold, iconic, geometric structure with long sloping, angular facets that are primarily directed toward the downtown Minneapolis skyline. Each of the building façades is a dynamic blend of metal panels and transparent or translucent curtain wall or ETFE (ethylene tetrafluoroethylene) membranes.

The draft design plans indicate façades of the new Stadium are a combination of metal panels, aluminum curtain wall systems, and Kasota limestone. The west elevation, also the proposed main entrance, features a video board behind perforated metal panels. Both the west and east elevations include three options for large sections of aluminum curtain wall: fixed, pivoting panels, and sliding panels.

The draft fixed roof design option uses stainless steel metal panels and integrates snow management gutters and a sub roof with a snow management basin. On the more vertically oriented faces of the roof, a clear or fritted ETFE membrane system is proposed and would allow natural light into the new Stadium. The draft operable-roof design option uses the same materials as the fixed roof option but has one large or two smaller panels that slide to create an opening in the roof.

The exterior materials of the new Stadium respond to context and climate of the Stadium site. The proposed design options would create dramatic views to and from the new Stadium from all sides, while also emphasizing the view from inside the Stadium to downtown Minneapolis.

The Metrodome and new Stadium are dominant views for properties abutting the Stadium site along 11th Avenue, 3rd Street, 5th Street, and Park (or Chicago) Avenue. Other properties further away from the Stadium site have obscured views of the Metrodome, either views of the roofline or views of a narrow section of the structure. These properties will have similar obscured and/or partial views of the new Stadium. The new Stadium is somewhat larger and, at its highest point, is approximately 100 feet taller than the Metrodome, assuming it is built at the same elevation as the existing structure. Therefore, the roofline of the building may be seen from a further distance in some locations, depending on the height of intervening buildings.

3.12.2.1 Mitigation

No adverse effects have been identified; therefore, no mitigation measures are proposed.

3.12.2.2 No Action Alternative

The No Action Alternative would not result in any changes to the existing stadium structure.

3.12.3 Lighting

A qualitative assessment of the nighttime lighting during events was performed to assess the possible spillover light from the new Stadium to areas surrounding the site. Impacts to the

surrounding environment of the new Stadium include artificial light spillover. The assessment compares the opacity of exterior materials and placement and quantity of exterior lighting of the existing Metrodome to that of the new Stadium draft design plans.

3.12.3.1 Affected Environment

The Metrodome façades are primarily comprised of opaque concrete, with little to no light spillover from the interior of the stadium. The dome of the stadium is translucent and casts a diffuse glow when the stadium is illuminated. The exterior of the building is illuminated on all sides with a variety of lighting types, including direct spot-lighting, and is a prominent and highly visible feature of the evening skyline on game days as well as non-game days. The Metrodome also features illuminated signs and message boards on its exterior.

3.12.3.2 Environmental Consequences

The new Stadium façades are proposed to be made of stone, metal panels, and large sections of translucent or transparent curtain walls or ETFE membrane systems that will allow a high degree of visibility and light transmission between the exterior and interior of the new Stadium. The proposed fixed roof option is primarily constructed of metal panels but would also include translucent ETFE membrane systems. The proposed operable roof options would also be constructed of a combination of metal panels and ETFE membrane systems; however, they have a higher percentage of translucent materials and would also open to allow natural lighting in and event lighting out. The new Stadium would feature a video board on the west façade as well as other exterior illumination.

The desired increase in visibility into and out of the new Stadium would also create additional light spillover from the new Stadium to the surrounding areas. Increased light levels are expected in the areas immediately surrounding the Stadium site during events. This additional light would contribute to a more vibrant and active pedestrian environment surrounding the Stadium site but may also adversely affect surrounding buildings, particularly residences, with additional light spillover during events.

3.12.3.3 Mitigation

Stadium Bowl Lighting

Vertical (150-200 foot-candle (FC)) and horizontal (250 FC) illuminance requirements for the field and air space above it are high, as expected. However, the requirement for all sports lighting luminaires to have internal louvers or external shields/visors will greatly reduce the amount of uplight spilled from this system. The multi-zone aiming requirement will limit light from being projected to unintentional areas, thereby further reducing the amount of light that will escape the new Stadium through the general admission entrances. The roof cover may also prevent direct sports lighting visibility from the sports lighting fixtures within the new Stadium.

Exterior Building Lighting

Specifics of the exterior building lighting system have yet to be determined; however, based on the draft design plans, it has a moderate potential for light spillover. To mitigate potential impacts to the surrounding environment, ambient and façade lighting should be aimed down, whenever possible. Additionally, building luminaires should not be exposed beyond what is needed to illuminate the building itself. Also, luminaire intensity should be kept to a minimum to prevent reflectivity from exterior building materials and minimize impacts to the motoring public on adjacent streets.

Site and Landscape Lighting

Exterior site lighting is proposed to be achieved with tall light towers that will feature floodlights for illuminating the ground plane and floodlights to illuminate the new Stadium façade. The floodlights

used to illuminate the new Stadium façade have a high potential for light spillover, both vertically and horizontally. To mitigate the amount of light spilled over, care will be taken to mount and aim the floodlights no higher than the new Stadium façade. Down lights mounted at the height of the façade would potentially be visible for two to three blocks when unobstructed by other buildings/structures or trees of a comparable height. Luminaire intensity and aiming angles towards the building should be kept to a minimum to minimize direct reflectivity from building materials, especially glass and steel. LED uplighting of landscape features should be sized appropriately to minimize penetration beyond foliage and other landscape features.

Interior Lighting

The interior lighting proposed should have minimal contribution to light spillover. Design plans should minimize light trespass in areas where the exterior walls are glass or transparent, such as the general admission plazas. Uplighting of architectural design features should be minimized in these areas as well but will not likely be visible beyond the immediate blocks adjacent to the new Stadium.

Exhibition Lighting

Exhibition lighting should have minimal contribution to light spillover. Exhibition lighting will only be used for special events and is not anticipated to be used on a regular basis. Luminaires used for special events will primarily be sourced from LED spot lights that will be aimed down onto exhibition floors and stages. Design plan elements should direct these luminaires only at the intended focus point to prevent lights from trespassing up and/or out of the new Stadium premise, particularly through the roof opening if that option is exercised.

3.12.3.4 No Action Alternative

The No Action Alternative would not result in any changes to the nighttime lighting during events

3.12.4 Downtown Skyline

3.12.4.1 Affected Environment

The Metrodome is a prominent and recognizable feature in the foreground of many views of the Minneapolis skyline. A photographic survey from street level was undertaken as part of the analysis of the potential impacts to the skyline, and several notable views of the Stadium site from various parts of the city were identified:

- View looking west from I-35W, between the Mississippi River and I-94
- View looking west from the Cedar Riverside Neighborhood
- View looking north from northbound I-35W as travelers approach downtown Minneapolis
- Views from the Elliot Park Neighborhood
- Views from close proximity to the Stadium site
  - The specific effects on these views are discussed in the section below.

3.12.4.2 Environmental Consequences

The massing, scale, and height of the Metrodome were compared to that of the new Stadium to assess the potential effects on the views of the skyline and other relevant viewsheds. The comparison study revealed that the new Stadium is somewhat larger than the Metrodome and is taller by approximately 100 feet at its highest point, assuming the existing and proposed structures are at a similar elevation. The surrounding structures are primarily multi-story office buildings or parking structures mixed with a small number of multi-story residential properties.

When comparing the elevations of the Metrodome and new Stadium the east and west elevations are nearly identical in width, but the new Stadium is approximately 100 feet taller at its highest point (290 feet) than the peak of the existing stadium (195 feet). When comparing the north and south elevations of the two stadiums, it is apparent that the new Stadium has a larger footprint; however, the sloping roof of the new Stadium is approximately the same height at its low, or eastern, peak (190 feet) as the peak of the Metrodome (195 feet). In general, the new Stadium is a larger and taller facility, and it would be more visible in the skyline and from other notable viewpoints surrounding the city. **Figure 3.12-2** shows existing views of the downtown skyline and the Metrodome from key viewpoints. The specific effects on the noted viewpoints are as follows:

- The existing view looking west from I-35W, between the Mississippi River and I-94, varies from a clear and unobstructed view of the Metrodome to a partially or fully obstructed view. The additional height of the new Stadium peak would make it more visible, but it would have minimal impact on views of the downtown skyline due to the viewing distance.
- The view looking west from the Cedar Riverside Neighborhood toward the downtown skyline would also change slightly when considering the additional height of the new Stadium peak. However, due to the distance between the viewing point and the new Stadium, the effect on views of the downtown skyline would be minimal.
- The view from northbound I-35W as travelers approach downtown Minneapolis ranges from a partial view to a fully obstructed view of the Metrodome. It is expected that the new Stadium would be slightly more visible in some views due to the height of the stadium peak. However, there would be minimal effect on views of the downtown skyline due to the distance between the viewing point and the new Stadium.
- There are a variety of views of the existing Metrodome from the Elliot Park Neighborhood that range from fully-obstructed to fully visible and visually predominant. Due to its proximity to the new Stadium, the visual effects of the additional mass would be greatest in this part of the city compared to the other notable views identified. It is expected that increased views of the new Stadium would occur at those locations where the existing stadium is currently fully or partially visible. These changes will have minimal impact on views of the downtown skyline.
- Other significant views proximate to the Stadium site include views from properties that are listed on the NHRP, identified in Section 3.10. Properties that have full views of the existing Metrodome will have somewhat more dominant views of the new Stadium, given the larger scale of the building. Properties that have partial views of the existing Metrodome (roofline or partial building views) will have similar views of the new Stadium but somewhat more dominant views of the roofline due to the increased height of the building peak. These changes will have minimal impact on views of the downtown skyline.

3.12.4.3 Mitigation

No adverse effects have been identified; therefore, no mitigation measures are proposed.

3.12.4.4 No Action Alternative

The No Action Alternative would not result in any changes to the downtown skyline.

3.13 Impact on Infrastructure and Public Services

3.13.1 Associated Public Infrastructure Improvements

Infrastructure improvements related to water use (Sections 3.2), stormwater management (Section 3.4), wastewater (Section 3.5), traffic (Section 3.7.1), parking (Section 3.7.2), and pedestrian movement (Section 3.7.3.1) are addressed elsewhere in this EIS.

3.13.2 Energy

3.13.2.1 Xcel Energy

Affected Environment

Xcel Energy currently serves the Metrodome with electrical power. Xcel Energy owns and operates the Elliot Park Electrical Substation, located immediately east of the Stadium site, east of 11th Avenue and north of 5th Street. This substation has two 115 kilovolt (kV) underground transmission lines in 11th Avenue that run to the substation from the north.

Xcel Energy owns and operates a 13.8 kV underground distribution line that runs from the substation in 11th Avenue, across the northeast corner of the existing Metrodome parking lot, before branching west in 4th Street and north under 4th Street/3rd Street in what was the 10th Avenue right-of-way. There are three Xcel electrical vaults located in the Metrodome parking lot associated with this underground distribution line. See **Figure 3.2-1** for existing utility information.

Environmental Consequences

Xcel Energy has the capacity to serve the new Stadium. There are no anticipated environmental consequences on Xcel Energy's Elliot Park Electrical Substation or its two 115 kV underground transmission lines. Construction of the new Stadium will require the relocation of Xcel Energy's 13.8 kV underground distribution line.

Mitigation

Any utility work or reconstruction of 11th Avenue will be required to work around Xcel Energy's two existing 115 kV underground transmission lines. Vault castings may need to be adjusted. Xcel Energy will be required to relocate its 13.8 kV underground distribution line and three electrical vaults before the commencement of construction. The likely relocation corridor would be along the south retaining wall along 4th Street.

No Action Alternative

Under the No Action Alternative the Metrodome would continue to function as it currently does. No changes to Xcel Energy's substation, transmission, or distribution system would be required to continue to allow the Metrodome to function.

3.13.2.2 CenterPoint Energy

Affected Environment

CenterPoint Energy currently serves the Metrodome with natural gas service. CenterPoint Energy owns and operates a 12 inch natural gas main in the planned vacated 5th Street right-of-way. See **Figure 3.2-1** for existing utility information.

Environmental Consequences

CenterPoint Energy has the capacity to serve the new Stadium with natural gas service. There are no anticipated environmental consequences on CenterPoint Energy's 12 inch natural gas main.

Mitigation

Any utility work or reconstruction in the vacated 5th Street right-of-way will be required to work around or relocate CenterPoint Energy's 12 inch natural gas main. This gas main will be potholed[7] to

[7] Potholing means excavating to determine the location and depth of underground utilities. This is typically done with a vacuum truck hose and pneumatically removing soil.

confirm horizontal and vertical location to confirm no impact by utility, roadway, or plaza construction required for the new Stadium.

No Action Alternative

Under the No Action Alternative the Metrodome would continue to function as it currently does. No changes to CenterPoint Energy's gas main system would be required to continue to allow the Metrodome to function.

3.13.2.3 District Energy

Affected Environment

NRG Energy, Inc. operates the Energy Center Minneapolis which supplies district heating and cooling in the city of Minneapolis. NRG Energy currently serves the Metrodome with steam. NRG Energy operates a cooling facility at 616 10th Street South, immediately south of Stadium site. NRG Energy also owns and operates underground district energy infrastructure in 6th Street, Chicago Avenue, and 5th Street west of Chicago Avenue.

Environmental Consequences

NRG Energy Inc. has the capacity to serve the new Stadium with steam. There are no anticipated environmental consequences to NRG Energy's cooling facility located at 616 10th Street South. There are no anticipated environmental consequences to NRG Energy's underground district energy infrastructure in 6th Street, Chicago Avenue, and 5th Street west of Chicago Avenue.

Mitigation

Any utility work or reconstruction in the 6th Street right-of-way, vacated 5th Street right-of-way, or Chicago Avenue right-of-way will be required to work around or relocate NRG Energy's underground district energy infrastructure. It will be prudent to pothole these facilities to confirm horizontal and vertical location to confirm no impact by utility, roadway, or plaza construction required for the stadium.

No Action Alternative

Under the No Action Alternative the Metrodome would continue to function as it currently does. No changes to NRG Energy district energy system would be required to continue to allow the Metrodome to function.

3.13.3 Communications

3.13.3.1 CenturyLink Communications

Affected Environment

CenturyLink Communications currently serves the Metrodome with telecommunications service. CenturyLink Communications owns and operates a large underground duct bank system in the planned vacated 5th Street right-of-way.

Environmental Consequences

CenturyLink Communications has the capacity to serve the new Stadium. There are no anticipated environmental consequences on CenturyLink Communications' underground duct bank system in the planned vacated 5th Street right-of-way.

Mitigation

Any utility work or reconstruction in the vacated 5th Street right-of-way will be required to work around or relocate CenturyLink Communications' underground duct bank system. This duct bank

system will be potholed to confirm horizontal and vertical location to confirm no impact by utility, roadway, or plaza construction required for the stadium.

No Action Alternative

Under the No Action Alternative the Metrodome would continue to function as it currently does. No changes to CenturyLink Communications' underground duct bank system would be required to continue to allow the Metrodome to function.

3.13.3.2 Data Center

Affected Environment

Ologix owns and operates the Minneapolis Gateway Data Center, located at 511 11th Avenue South. This data center is a carrier hotel for numerous national, regional, and local communication network clients. The public right-of-way around this facility contains national, regional, and local communication network underground communication infrastructure.

Environmental Consequences

There are no anticipated environmental consequences to the Minneapolis Gateway Data Center located at 511 11th Avenue South. There are no anticipated environmental consequences to the national, regional, and local communication network underground communication infrastructure in the public right-of-way.

Mitigation

Any utility work or reconstruction in the 6th Street right-of-way, vacated 5th Street right-of-way, 11th Avenue right-of-way, or Chicago Avenue right-of-way will be required to work around or relocate the national, regional, and local communication network underground communication infrastructure in the public right-of-way. It will be prudent to pothole these facilities to confirm horizontal and vertical location to confirm no impact by utility, roadway, or plaza construction required for the new Stadium.

No Action Alternative

Under the No Action Alternative the Metrodome would continue to function as it currently does. No changes to national, regional, and local communication network underground communication infrastructure would be required to continue to allow the Metrodome to function.

3.13.4 Public Services

3.13.4.1 Affected Environment

Among the public services provided by the City of Minneapolis that are potentially affected by the Proposed Project are emergency response services and public street/sidewalk maintenance. Solid waste management is addressed in Section 3.6.

3.13.4.2 Environmental Consequences

No substantive change in demand for public safety services is anticipated as a result of the Proposed Project. The Proposed Project includes features and staffing for patron and staff safety within the new Stadium and on the Stadium site.

The MSFA will consult with the City of Minneapolis Police and Fire Departments as design progresses to ensure safe and efficient access is provided to the site for emergency vehicles. The MSFA will also consult with Hennepin County Medical Center regarding ambulance accessibility and service.

The MSFA will be responsible for the removal of snow on the Stadium site and general maintenance of the new Stadium.

3.14 Cumulative Potential Effects

3.14.1 Background

This section describes the potential for cumulative effects, both direct and indirect, from the Proposed Project in combination with other past, present, and future actions.

A cumulative effects analysis takes into account other known or reasonably foreseeable actions and their potential impacts that are unrelated to the proposed action, except to the extent that their impacts may, in combination with the impacts from the proposed action, result in adverse impacts. Cumulative impacts are defined in Minnesota Rules 4410.0200 as the following:

> Cumulative Impact: "the impact on the environment that results from incremental effects of the project in addition to other past, present, and reasonably foreseeable future projects regardless of what person undertakes the other projects. Cumulative impacts can result from individually minor but collectedly significant projects taking place over a period of time."

The cumulative impacts analysis includes the following steps:

- **Identify effects associated with the proposed action.** The goal of this assessment is to identify the cumulative effects on social, economic, and environmental resources that may result from construction and operation of the Proposed Project and other reasonably foreseeable projects. The assessment is based on information compiled for the EIS as well as information readily available for the other actions identified.

  The Proposed Project may affect several resources either directly or indirectly. However, the role of the cumulative effects assessment is to narrow the focus of the cumulative effects analysis to those issues for which the Proposed Project has an effect that could potentially combine with effects from other actions to create a cumulative impact. Resources that are only affected by the development of the new Stadium site (e.g., encountering contamination) or where the impact is positive (e.g., generation of wastewater) do not have potential for cumulative impacts. Issues for which the Proposed Project has an adverse impact, whether the impact is minor or substantial, need to be considered for potential cumulative impacts. For the Proposed Project, the issues relevant to cumulative impacts assessment include the following:

  - Groundwater/Surface Water
  - Erosion and Sedimentation
  - Water Quality: Surface Water Runoff
  - Site Generated Waste
  - Traffic
  - Parking
  - Other Transportation Modes – Bicycle Facilities
  - Traffic Noise
  - Event Noise
  - Historical/Architectural Resources
  - Visual Impacts
  - Construction-Related Impacts

- **Establish the geographic scope for the analysis.** The geographic scope appropriate for the cumulative impacts analysis is the Stadium site influence-area, generally bounded by Park

Avenue to the west, 6th Street to the south, 11th Avenue to the east, and 3rd Street to the north. An alternate alignment of the plaza may be in an east/west orientation. This East/West Alternate Plaza Configuration would be between Chicago and 5th Avenues, between 4th and 5th Streets.

- **Establish the timeframe for the analysis.** The timeframe is in the 10-year horizon which reflects the understood implementation schedule for reasonably foreseeable projects, identified below.
- **Identify other actions affecting the resources, ecosystems, and human communities of concern.** The following projects have been identified as reasonably foreseeable and have the potential to interact with the Proposed Project as to cause varying degrees of reasonably foreseeable cumulative impacts. Each of the identified projects is or has elements that are geographically proximate to the Stadium site.
  - Infrastructure improvements
    - 10th Avenue Bridge rehabilitation
    - Traffic and safety improvements on 4th Avenue South from 10th Street South to 3rd Street South
    - Replacement of the driving surface on 4th Street South, 8th Street South, and 9th Street South from Hennepin Avenue to Chicago Avenue
    - Replacement of the driving surface on 14th Street South from Park Avenue to 11th Avenue South
    - Rehabilitation/repairs of the Central City and MnDOT (I-35W) storm water tunnels
    - Sealcoating on 10th Street South between 3rd Avenue South and 11th Avenue South
    - Street resurfacing of 11th Street South between 3rd Avenue South and 11th Avenue South
    - Tunnel work on Washington Street between Hennepin Avenue and Portland Avenue
    - A signal timing optimization project that includes all signalized intersections in downtown Minneapolis
    - Construction of a new freeway entrance ramp from 4th Street South to I-35W northbound
    - Central Corridor LRT line sharing the existing Hiawatha LRT alignment within the Proposed Project area, utilizing the same stations
    - Two-way operations on Park Avenue South and Portland Avenue South
    - Two-way operations on 9th Street South and 10th Street South, east of 5th Avenue South
    - New exit ramp from westbound I-94 to 7th Street South
    - Changes to Washington Avenue South and 3rd Street South interchanges at I-35W
  - Development
    - Parking ramp development is being included in the assessment of the Proposed Project (under various options). It is possible that additional development/ redevelopment (e.g., new housing, office, retail, restaurant uses) will be proposed in the area during the timeframe for analysis; however, no specific proposals are identified at this time.

3.14.2 Potential Cumulative Impacts

The final step in the process is the evaluation of potential for cumulative impacts on the identified issues, as discussed below.

3.14.2.1 Groundwater/Surface Water

Proposed Action: Dewatering would be required during Proposed Project construction and as part of the permanent new Stadium design. The use of wells and/or cut-off walls can be anticipated to control groundwater during construction. Discharge of all dewatering efforts would pass through approved on-site BMPs prior to discharge.

Other Actions: The other foreseeable future actions may also require dewatering due to the high water table in the project vicinity.

Potential for Cumulative Impact: A Minnesota DNR Water Appropriation Permit is required for dewatering that withdraws more than 10,000 gallons of water per day. Since the DNR is able to manage the number of permits it allows, the potential for adverse cumulative impacts on groundwater is minimal.

3.14.2.2 Erosion/Sedimentation

Proposed Action: The potential for erosion and sedimentation during construction exists as soils are disturbed by excavation and grading. Particular attention should be paid to areas with steep slopes as they can present unstable soil conditions that can result in erosion if not properly managed during construction activities. There is one area of steep slopes in the northeast quadrant of the Stadium site. Erosion and sedimentation of all exposed soils within the Proposed Project area would be minimized by utilizing the appropriate BMPs during construction, as required by the NPDES construction stormwater permit.

Other Actions: Most of the infrastructure improvement projects identified above are unlikely to cause erosion or sedimentation due to nature of the work. There is potential for erosion in the other actions involving road construction, tunnel work, and site work for new development/redevelopment. Each project would be required to conform to regulatory requirements (e.g., NPDES construction stormwater permit).

Potential for Cumulative Impact: Erosion control plans and appropriate BMPs are required as part of the NPDES construction stormwater permit and City permitting processes; therefore, there is minimal potential for adverse cumulative impacts due to soil erosion and sedimentation.

3.14.2.3 Water Quality: Surface Water Runoff

Proposed Action: The Proposed Project is estimated to result in an increase of 1.3 acres of impervious surface (as a worst case).

Other Actions: With the exception of the ramp additions, the infrastructure improvement projects listed above would not likely generate additional impervious surface. Future development in the area has the potential to increase impervious surfaces; however, as this is a developed urban area the increase would not be substantial.

Potential for Cumulative Impact: Because the regulatory requirements for the Proposed Project are more stringent than when the Metrodome was built, the Proposed Project, with mitigation, would likely reduce runoff volume, and water quality may be improved over that of the No Action Alternative. Other actions affecting water quality and runoff would also be subject to similar requirements. Therefore, there is minimal potential for adverse cumulative impacts due to water quality and surface water runoff.

3.14.2.4 Site Generated Waste

Proposed Action: The Proposed Project would involve complete demolition of the Metrodome, outlying facilities, neighboring buildings, city streets, and underground infrastructure, which would result in demolition debris. It is estimated that 95 percent to 98 percent of the solid wastes generated during demolition would be recycled, and the remainder would be disposed at a State permitted landfill. However, if those projections are not met the Proposed Project would require disposal of solid waste materials at area landfills, thereby shortening the operating life of those facilities. Handling, transportation, and disposal of solid wastes generated during the demolition, site preparation, and construction of the Proposed Project would also result in transient environmental consequences in the areas of traffic; vehicle-related air emissions; odors, noise, and dust; soil conditions; surface water runoff; erosion and sedimentation; and visual impacts.

Other Actions: Some of the infrastructure improvement projects and any new development/ redevelopment would likely generate waste during construction.

Potential for Cumulative Impact: The potential for cumulative impacts on the capacity of State permitted landfills depends upon the Proposed Project's ability to reach the recycling objectives for demolition debris and the generation and management of similar debris by other future projects; however, it is likely to be minimal.

3.14.2.5 Traffic

Proposed Action: The Proposed Project would result in varying impacts to local traffic depending upon scenario and year of analysis; the two roadway network options and two parking plans that were analyzed resulted in one or more additional intersections operating at LOS E or F compared to the No Action Alternative. The freeway analysis also identified scenarios where freeway ramp locations were identified as approaching or over capacity.

Other Actions: The infrastructure improvement projects would not add traffic in the study area. Traffic generation due to future development/redevelopment would depend upon density and land use.

Potential for Cumulative Impact: The traffic analysis assumed the proposed ramp improvements and background growth rate of 0.5% a year that should account for impacts from typical downtown redevelopment activity. Therefore, the potential for cumulative traffic effects is minimal.

3.14.2.6 Parking

Proposed Action: The Proposed Project is expected to generate an additional 2,050 vehicles compared to No Action event conditions. Depending upon the parking plan scenario, up to 1,100 additional parking stalls are proposed; most of the remaining event vehicles can be accommodated by the reserve capacity in the Downtown East area, with the 2017 weekday event and the dual event scenarios resulting in the least ability to accommodate all vehicles in the nearby downtown area. By 2030 parking demand is expected to decrease by 25 to 30 percent.

Other Actions: Infrastructure improvements would result in no additional parking demand. The parking demand resulting from future development/redevelopment would depend upon density and land use but is mitigated by the availability and on-going investment in transit.

Potential for Cumulative Impact: As noted, parking demand is expected to decline over time due to the transit services of the future Southwest and Bottineau LRT lines. This combined with proposed additional parking would result in a minimal potential for adverse cumulative effects.

3.14.2.7 Other Transportation Modes – Bicycle Facilities

Proposed Action: The Proposed Project would pose potential operational challenges for traffic and bicyclists at the intersections of 6th Street/Chicago Avenue and 6th Street/11th Avenue.

Other Actions: It is not anticipated that the infrastructure or potential development projects identified above would result in permanent impacts on bicycle facilities, though short term effects during street projects could occur.

Potential for Cumulative Impact: Signage and coordination with the Minneapolis Bicycle Advisory Committee are recommended as mitigation for any impacts of the Proposed Project on bicycle facilities. It is expected that the Minneapolis Bicycle Advisory Committee would be consulted on other projects that could affect bicycle facilities. Therefore, the potential for adverse cumulative impacts to bicycle facilities should be minimal.

3.14.2.8 Traffic Noise

Proposed Action: Construction of the Proposed Project would result in increases in traffic noise of less than 3.0 dBA at most modeled receptor locations compared to the No Action Alternative with event arrival traffic. Under the Proposed Project scenario with closure of Park and Portland Avenues, some receptor locations are projected to experience a decrease in sound levels of less than 1 dBA (L_{10}) compared to the No Action Alternative.

Other Actions: The infrastructure improvement projects listed above mainly consist of reconstruction, rehabilitation, and safety-related improvements that are not likely to generate additional traffic noise. Ramp additions have the potential for resulting in traffic noise changes. New development may generate additional traffic depending upon density and use.

Potential for Cumulative Impact: The noise analysis utilized forecast traffic volumes that assume future foreseeable development; therefore, the noise analysis already considers cumulative impacts associated with traffic noise.

3.14.2.9 Event Noise

Proposed Action: Without mitigation, event noise associated with the new Stadium is anticipated to exceed the sound level requirements of the Minnesota Rules at a commercial land use, tailgating within 235 feet of a residential structure and 110 feet of a commercial structure would exceed the sound level requirements of the Minnesota Rules, and sound levels from plaza events would exceed the sound levels of the Minnesota Rules at a commercial land use.

Other Actions: It is not anticipated that the future infrastructure or development projects identified above would generate event noise.

Potential for Cumulative Impact: The other foreseeable future actions are not likely to generate additional event noise; therefore, there is minimal potential for adverse cumulative impacts.

3.14.2.10 Historical/Architectural Resources

Proposed Action: The Proposed Project would result in some change to the views to and from NRHP listed properties. The Proposed Project would change traffic volumes during events in the vicinity of the Minneapolis Armory, the Advance Thresher/Emerson-Newton Company and Northern Implement Company, and the Grain Exchange properties. State daytime noise standards would be exceeded at the Minneapolis Armory under various Proposed Project scenarios.

Other Actions: The potential for visual (views and lighting), traffic, and noise impacts from other actions are noted elsewhere in this section. Based on these impacts, it is not anticipated that the future infrastructure or development projects identified above would have additional effect on the NRHP-listed properties.

Potential for Cumulative Impact: The other foreseeable future actions are not likely to generate additional effects to the NRHP-listed properties; therefore, there is minimal potential for adverse cumulative impacts.

3.14.2.11 Visual Impacts

Proposed Action: The Proposed Project is a new Stadium that is somewhat larger and, at its highest point, approximately 100 feet taller than the existing Metrodome, assuming it is built at the same elevation as the existing structure. Therefore, the roofline of the building may be seen from a further distance in some locations, depending on the height of the intervening buildings. Increased light levels are expected in the areas immediately surrounding the site during events. This additional light would contribute to a more vibrant and active pedestrian environment surrounding the site but may also adversely affect surrounding buildings, particularly residences, with additional light spillover during events.

Other Actions: It is not anticipated that the infrastructure projects identified above would result in impacts affecting downtown views or impacts related to lighting. Typical downtown office, commercial, and residential redevelopment is compatible with the downtown visual environment and does not include unusual lighting.

Potential for Cumulative Impact: The other foreseeable future actions are not likely to generate additional visual impacts due to lighting; therefore, there is minimal potential for adverse cumulative impacts.

3.14.2.12 Construction Related Impacts

Proposed Action: In addition to the impacts listed above that are specific to construction, the Proposed Project would result in construction related impacts including temporary noise, construction related odors, fugitive dust, and change in traffic patterns.

Other Actions: Each of the other actions has the potential for temporary noise, odors, dust, and change in traffic patterns during the construction phase.

Potential for Cumulative Impact: The temporary impacts of the Proposed Project would be mitigated through standard good construction practices and adherence to City ordinances. The potential for similar temporary effects are expected to be mitigated in the same way. Therefore, the potential for adverse cumulative impacts due to construction related impacts would be minimal.

3.14.2.13 Conclusion

The Proposed Project has minimal potential for cumulative impacts to the resources directly or indirectly affected by the Proposed Project.

3.15 Construction Related Impacts

3.15.1 Construction Staging and Phasing

3.15.1.1 Demolition of the Existing Facility

A pre-demolition survey will be conducted prior to the commencement of demolition. Demolition of the Metrodome will commence as soon as the facility is vacated, which is expected to occur in January 2014. Demolition will begin with the removal of the fabric roof and its structure and demolition of the loading dock area. After the roof material is removed, demolition of the stadium structure will commence in the northeast quadrant of the building. It has yet to be determined in what sequence the demolition will proceed. Implosion has not been eliminated as a possible means of demolition. Regardless of the demolition methods, there will be strict adherence to the City's street cleaning, noise, and dust control ordinances. Dust control BMPs will include watering down the construction site as required, street sweeping as required, and using crushed rock filters at all construction entrances and exits. No concrete crushing on site is anticipated.

The Proposed Project would also involve the demolition of the existing Star Tribune building on the block bounded by 4th and 5th Streets, and Park and Portland Avenues. Approximately 600 people currently work in the 425 Portland. If these employees need to be relocated, the Star Tribune has stated that it will search for existing space in downtown Minneapolis to lease. Demolition of this building is expected to occur prior to new Stadium completion. A pre-demolition survey will be conducted prior to the commencement of building demolition.

All demolition debris will be recycled or disposed off-site in appropriate facilities, as required for demolition materials or other regulated substances. Necessary demolition permits would be obtained from the City.

3.15.1.2 Construction Staging

The start of construction has not yet been determined due to various factors, including design issues and contractual matters. It is anticipated that construction may start as early as October 1, 2013 and as late as January 1, 2014. It is anticipated that the Excel Energy distribution line which crosses the northeast side of the site will be relocated by Excel Energy prior to October 1, 2013.

The existing stormwater system will be utilized until demolition of the Metrodome. Temporary measures may be needed to reroute portions of the system prior to the start of demolition. Stormwater affected by demolition of the existing system will be filtered on site and subsequently pumped into the active stormwater utility system. The existing sanitary line on the west side of the site will remain in service throughout construction. Management of stormwater will be in accordance with the Stormwater Pollution Prevention Plan to be prepared for the project, and part of the NPDES permit.

During the first quarter of 2014, the closure of 5th Street will occur and be in effect throughout the duration of the Proposed Project. Kirby Puckett Place will experience intermittent road closures during the Proposed Project, and at this point these are not anticipated to be long-term closures. Intermittent lane closures are anticipated to occur at 6th Street for road modifications managed by the City of Minneapolis.

The primary vehicular access for construction vehicles associated with deliveries and hauling will be off of 4th Street. Vehicle gates are anticipated at both the northwest and northeast corners of the site off of 4th Street. There will be no construction trade parking on site, and the Proposed Project will not be designating any specific off-site parking for construction trade workers.

3.15.1.3 Construction Process

The general construction sequence and time frame will occur as follows:

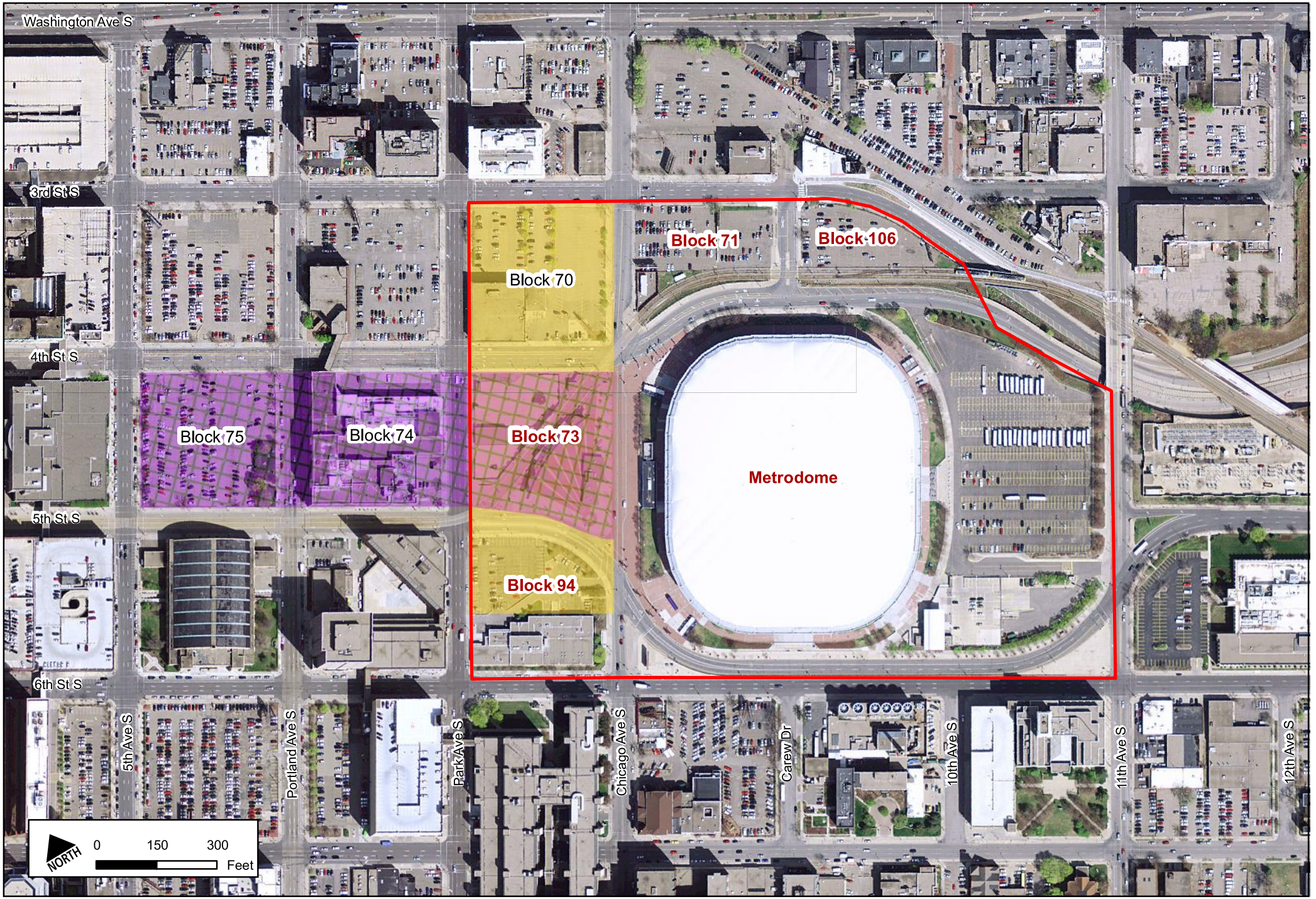
- Improvements to TCF Stadium – summer 2014
- Demolition of Metrodome – first quarter of 2014
- Excavation – first quarter of 2014 to third quarter of 2014
- Foundations – first quarter of 2014 to fourth quarter of 2014
- Building structure – second quarter of 2014 to second quarter of 2015
- Roof structure – third quarter of 2014 to fourth quarter of 2015
- Enclosure – second quarter of 2014 to fourth quarter of 2015
- Interior finishes – fourth quarter of 2015 to second quarter of 2016
- Sitework – third quarter of 2015 to second quarter of 2016

3.15.1.4 Construction Techniques to Address Nearby Facilities

The first phase of construction will include excavation and installation of earth retention systems in the northeast corner of the site, outside of the footprint of the Metrodome. The earth retention system will likely include driven steel piles.

The foundation system of the new Stadium will also likely include driven steel piles. The average depth of these piles will be relatively shallow. This work is anticipated to last six months, starting in the first quarter of 2014 and extending into the third quarter of 2014.

Based on the information known at this time, hours of demolition and construction will be in compliance with City code.



Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT

Legend

- Stadium Site Boundary
- North/South Alternate Plaza Configuration
- East/West Alternate Plaza Configuration

Block Numbers Referenced in Section 3.1.2.2

Blocks with Potential Contaminant Impacts

Figure 3.1-1. Blocks with Potential Contaminant Impacts

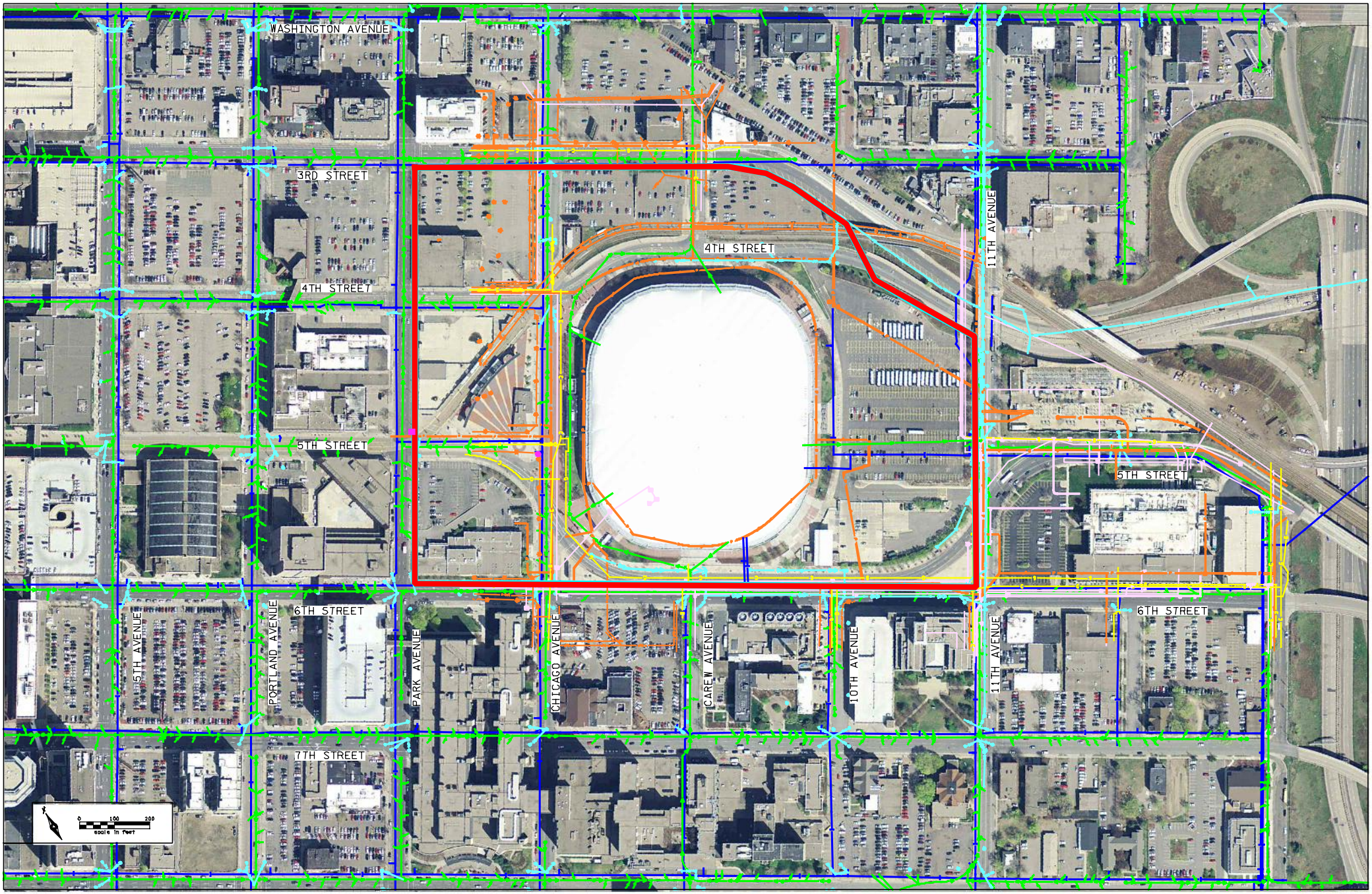
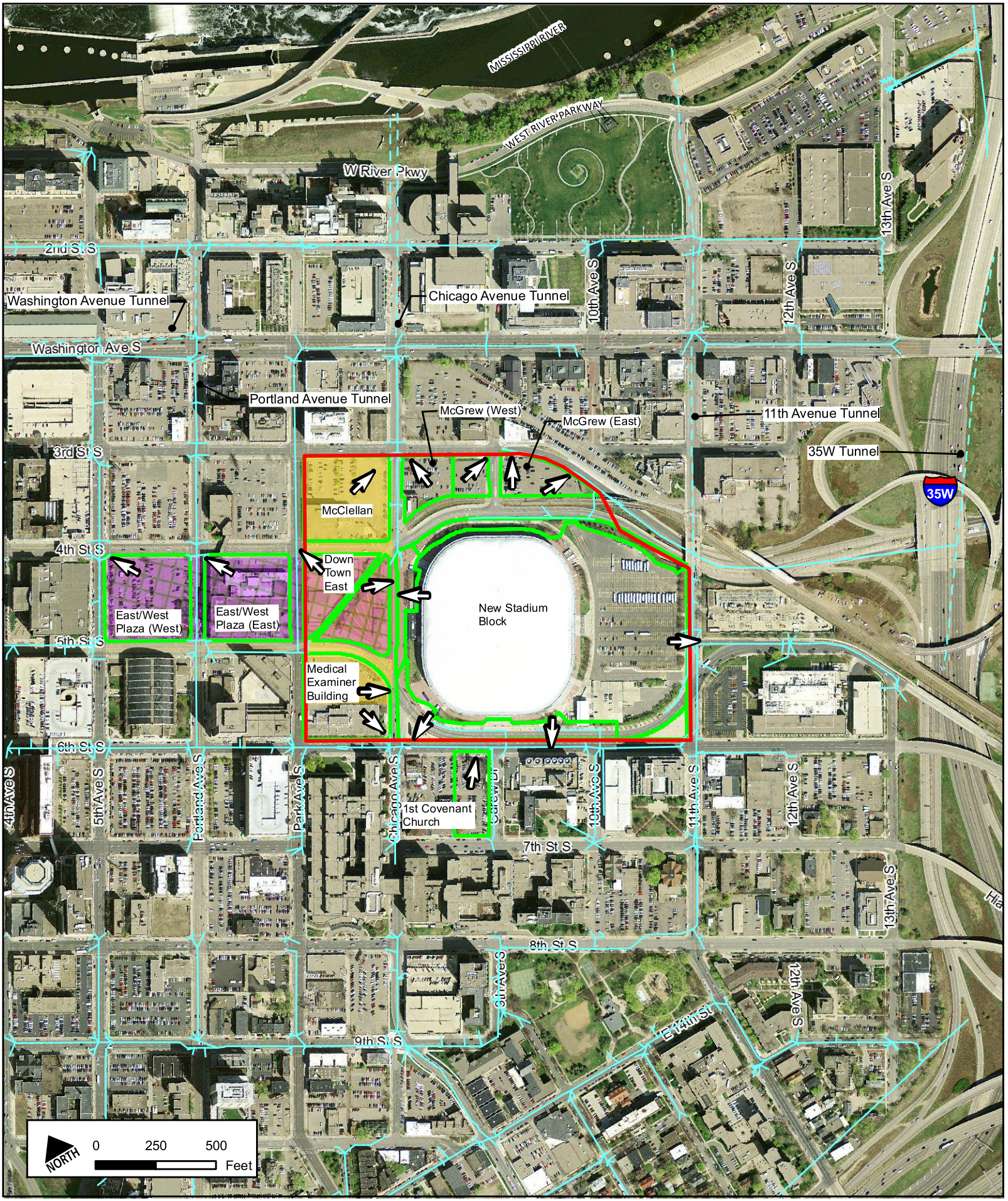


Figure 3.2-1. Existing Utilities

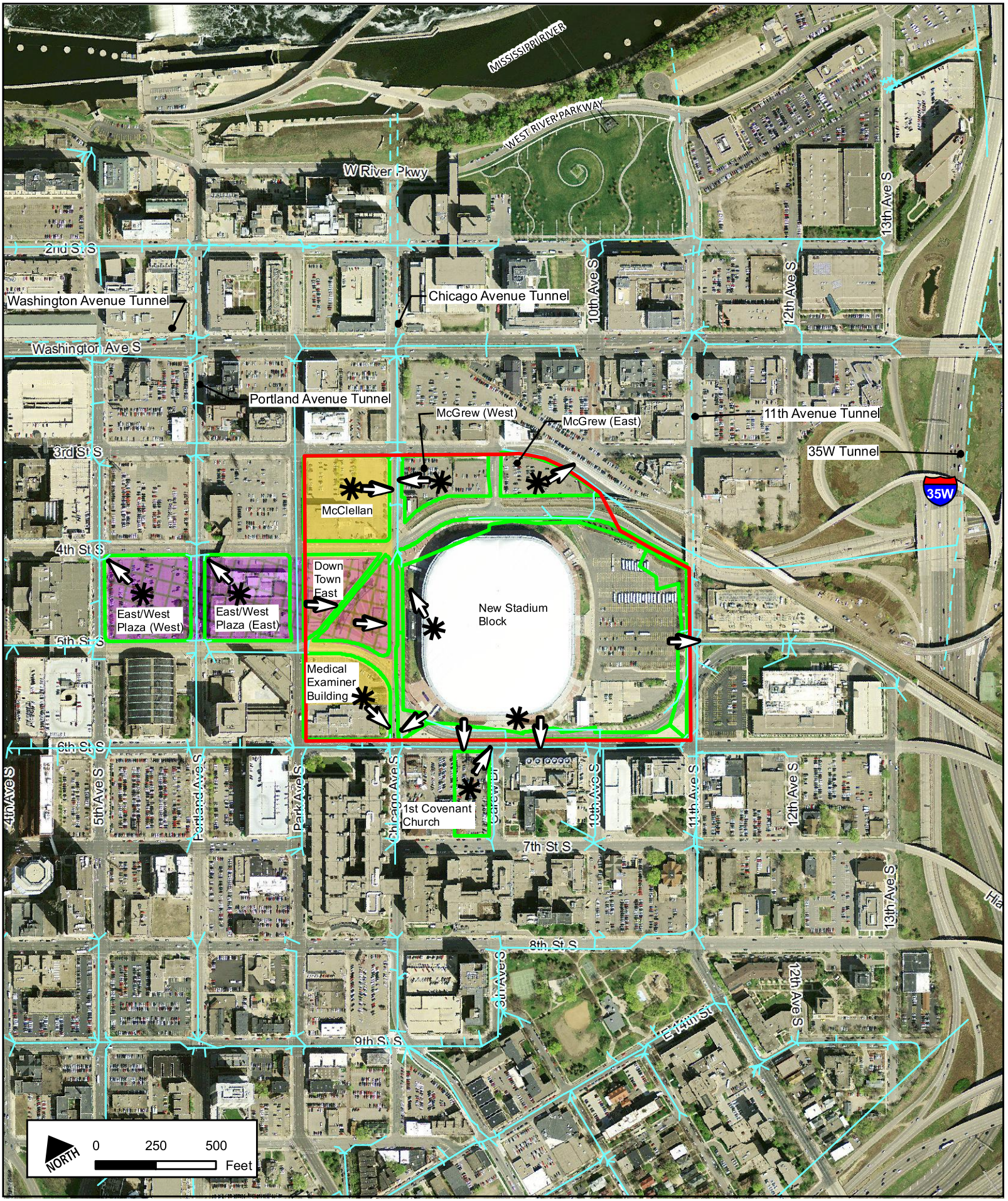


Legend

- Stadium Site Boundary
- East/West Alternate Plaza Configuration
- North/South Alternate Plaza Configuration
- Drainage Boundaries
- Existing Storm Sewer
- Flow Direction

Figure 3.4-1. Existing Drainage

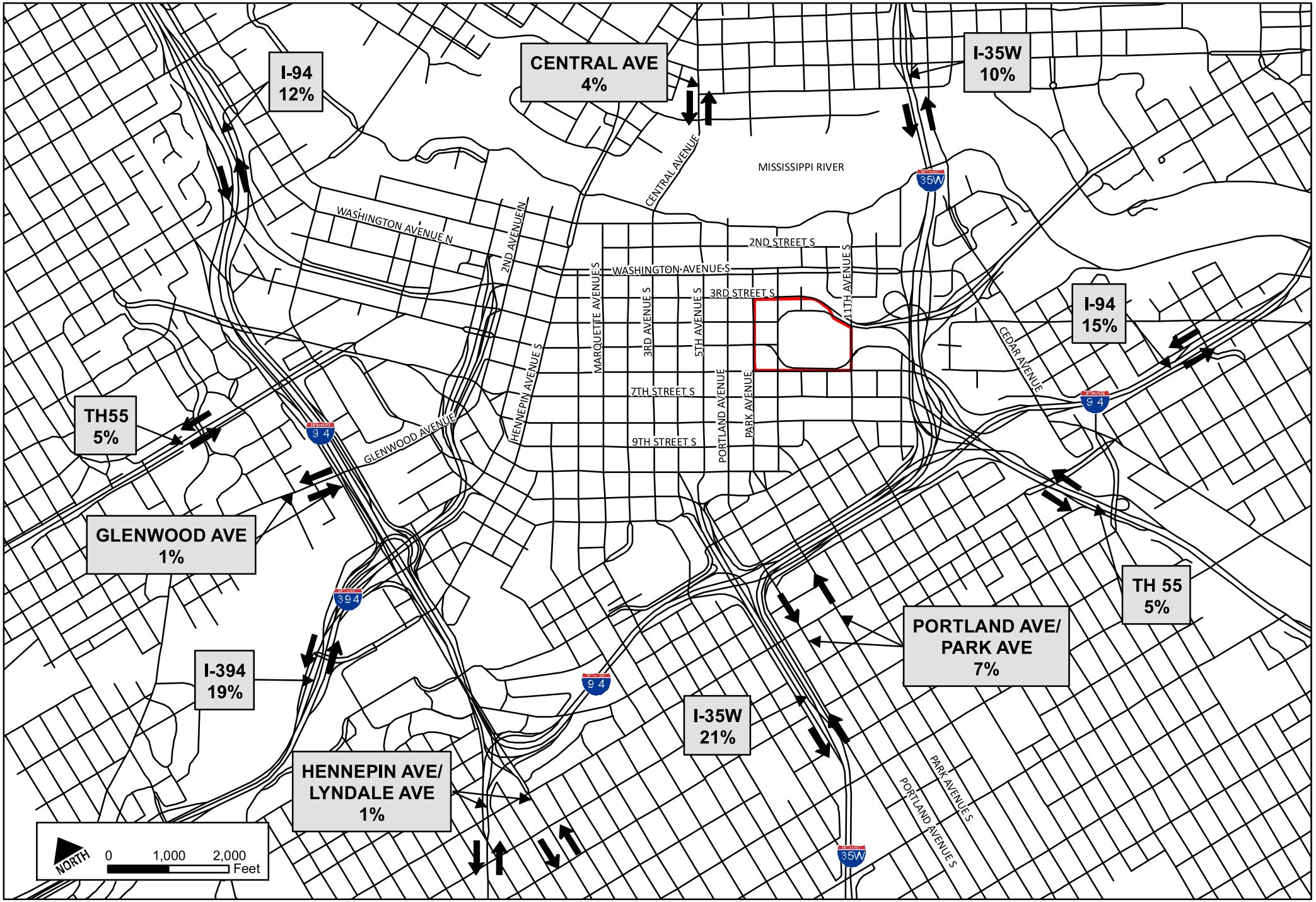
Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT



Legend

- Stadium Site Boundary
- East/West Alternate Plaza Configuration
- North/South Alternate Plaza Configuration
- Drainage Boundaries
- Existing Storm Sewer
- Flow Direction
- Potential BMP Location

Figure 3.4-2. Proposed Drainage



Legend

Stadium Site Boundary

Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT

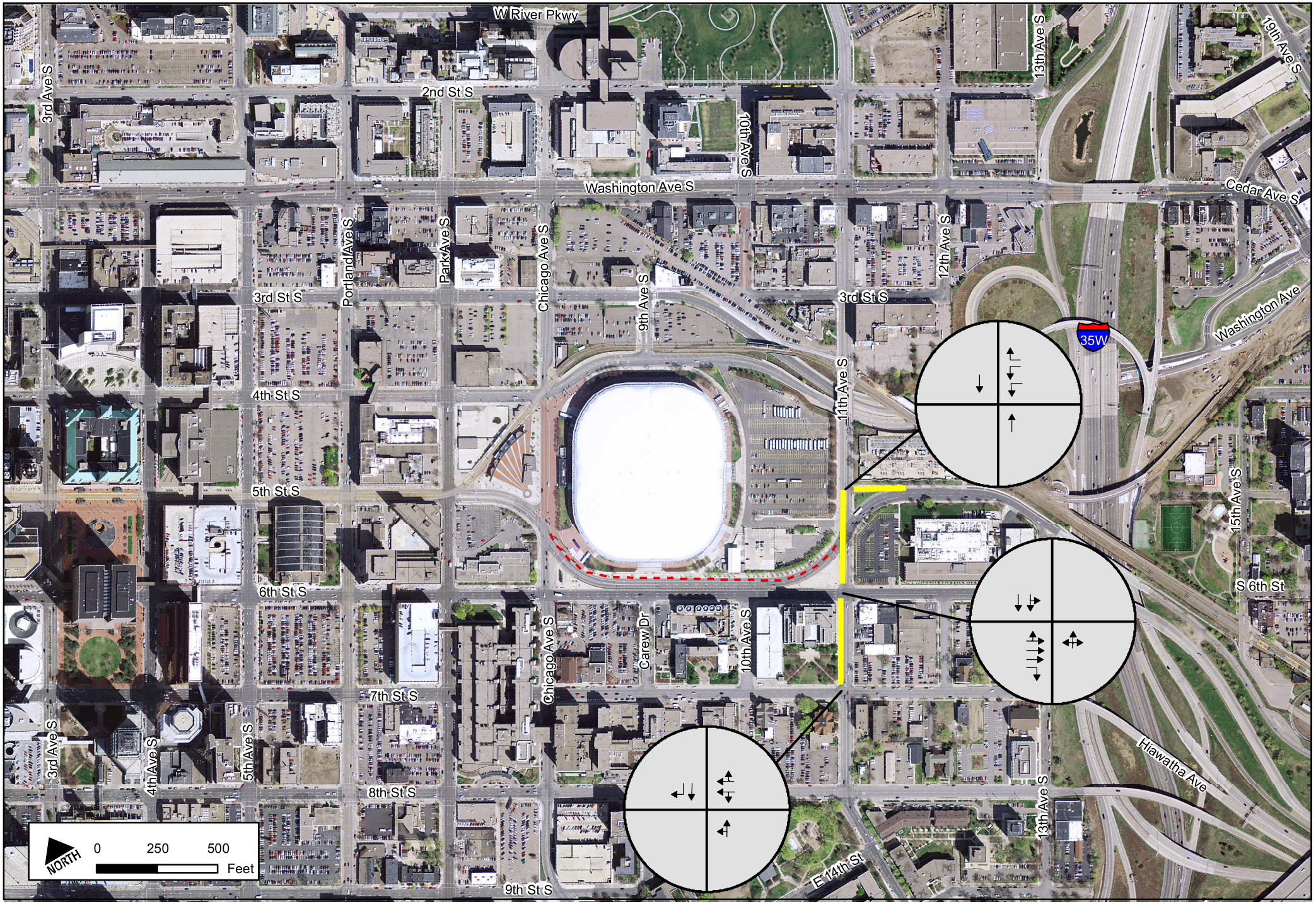
Figure 3.7-1. Proposed Trip Distribution

Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT

Legend

- Intersections to be Analyzed
- Proposed Permanent Road Closure

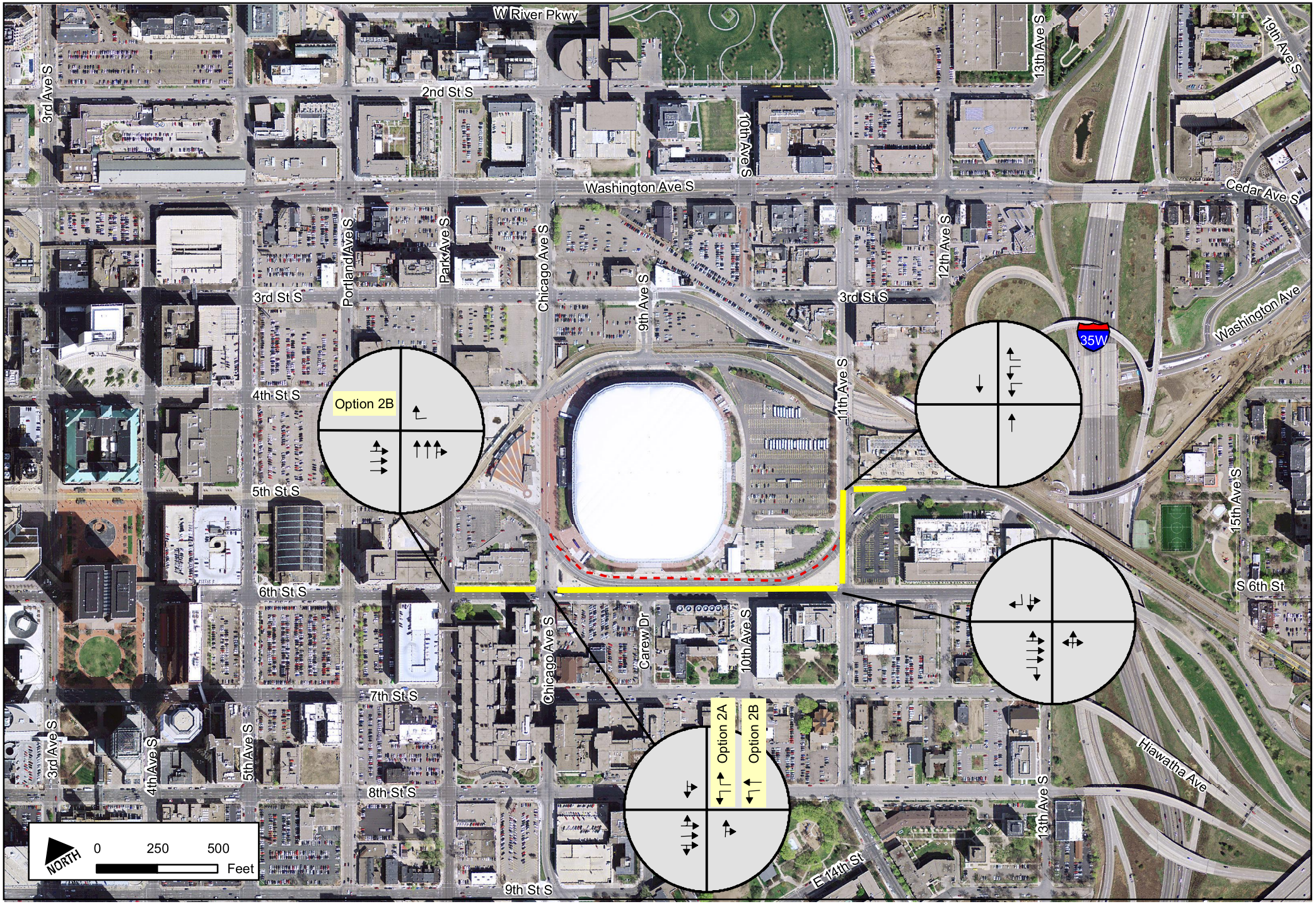
Figure 3.7-2. Proposed Weekday AM/PM Peak Analysis



Legend

- Option 1 Improved Geometry
- Proposed Permanent Road Closure

Figure 3.7-3. Proposed Option 1 Geometrics

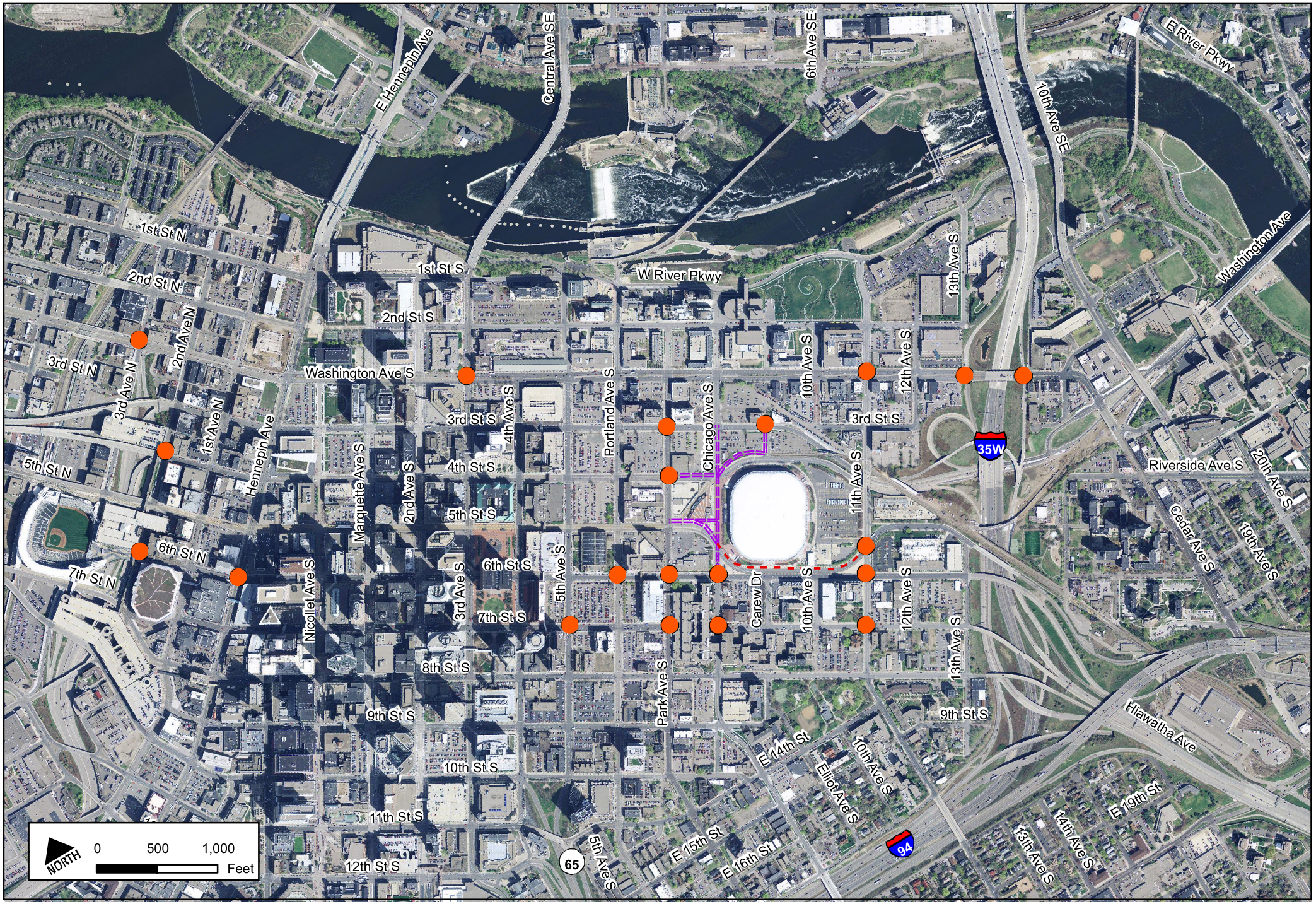


Legend

- Option 2 Improved Geometry
- Proposed Permanent Road Closure

Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT

Figure 3.7-4. Proposed Option 2 Geometrics



Legend

- Intersections to be Analyzed
- Proposed Permanent Road Closure
- Proposed Event Road Closure

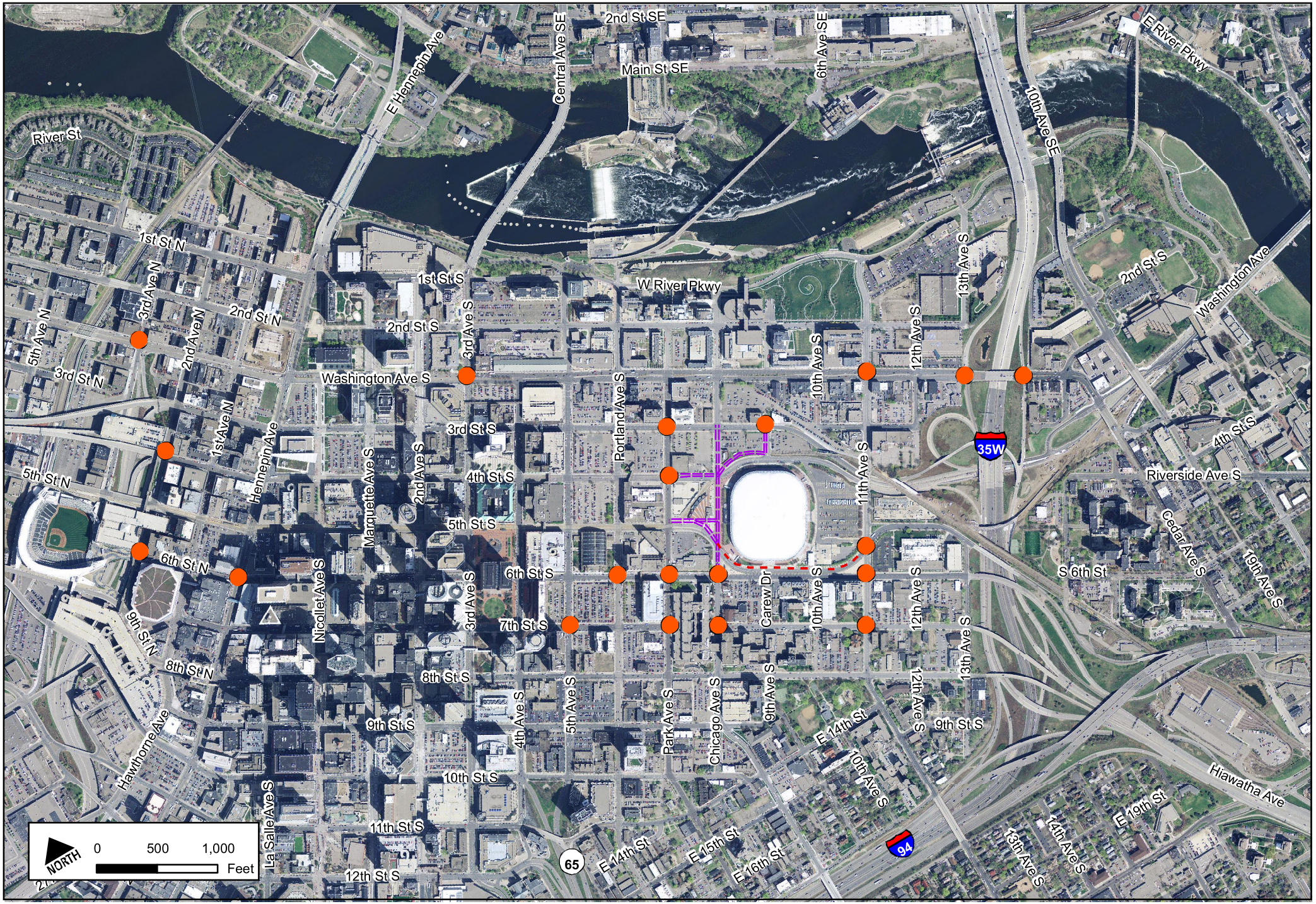
Figure 3.7-5. Proposed Weekend Event Arrival Analysis

Legend

- Intersections to be Analyzed
- Proposed Permanent Road Closure
- Proposed Event Road Closure

Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT

Figure 3.7-6. Proposed Weekend Event Departure Analysis

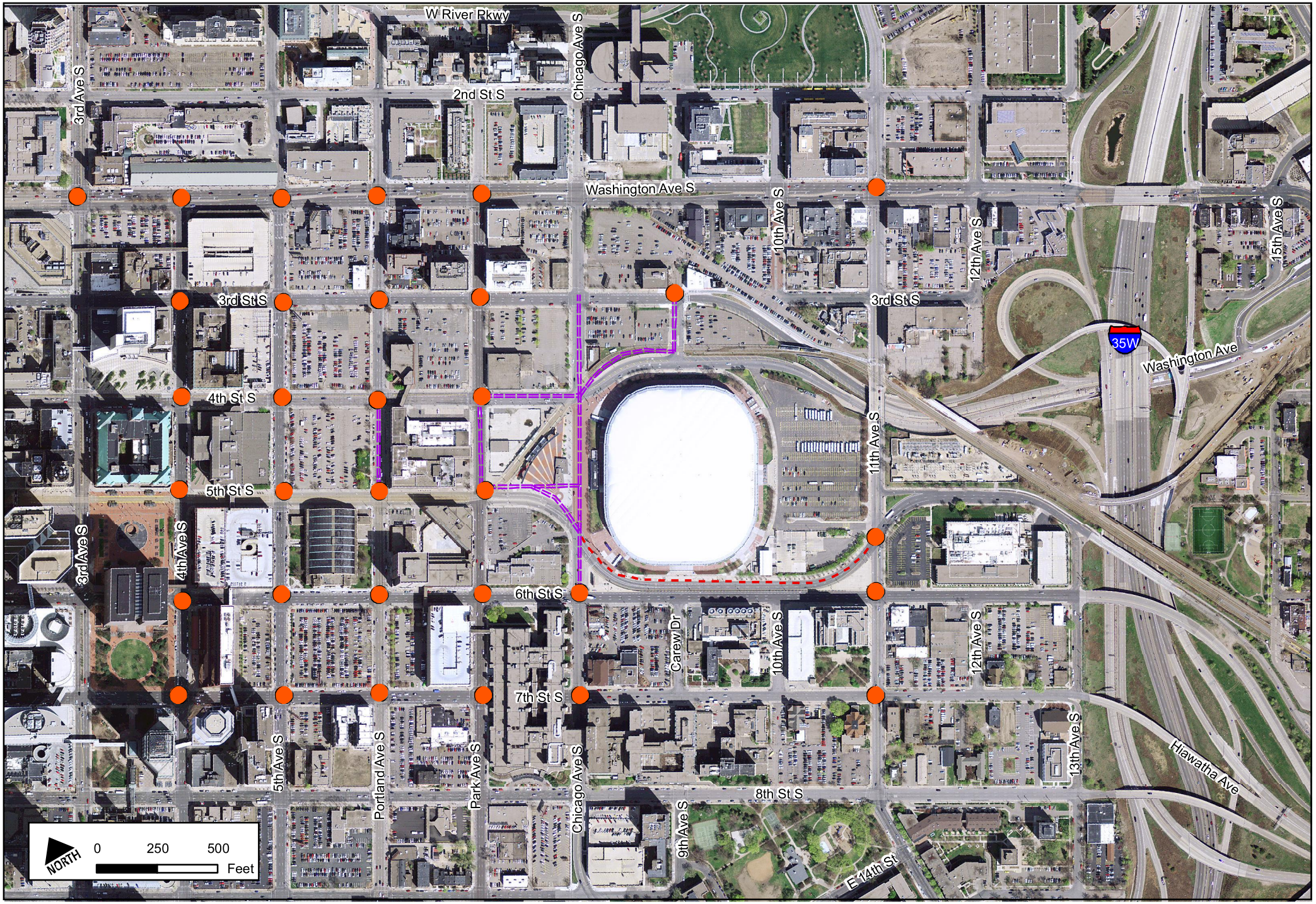


Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT

Legend

- Intersections to be Analyzed
- Proposed Permanent Road Closure
- Proposed Event Road Closure

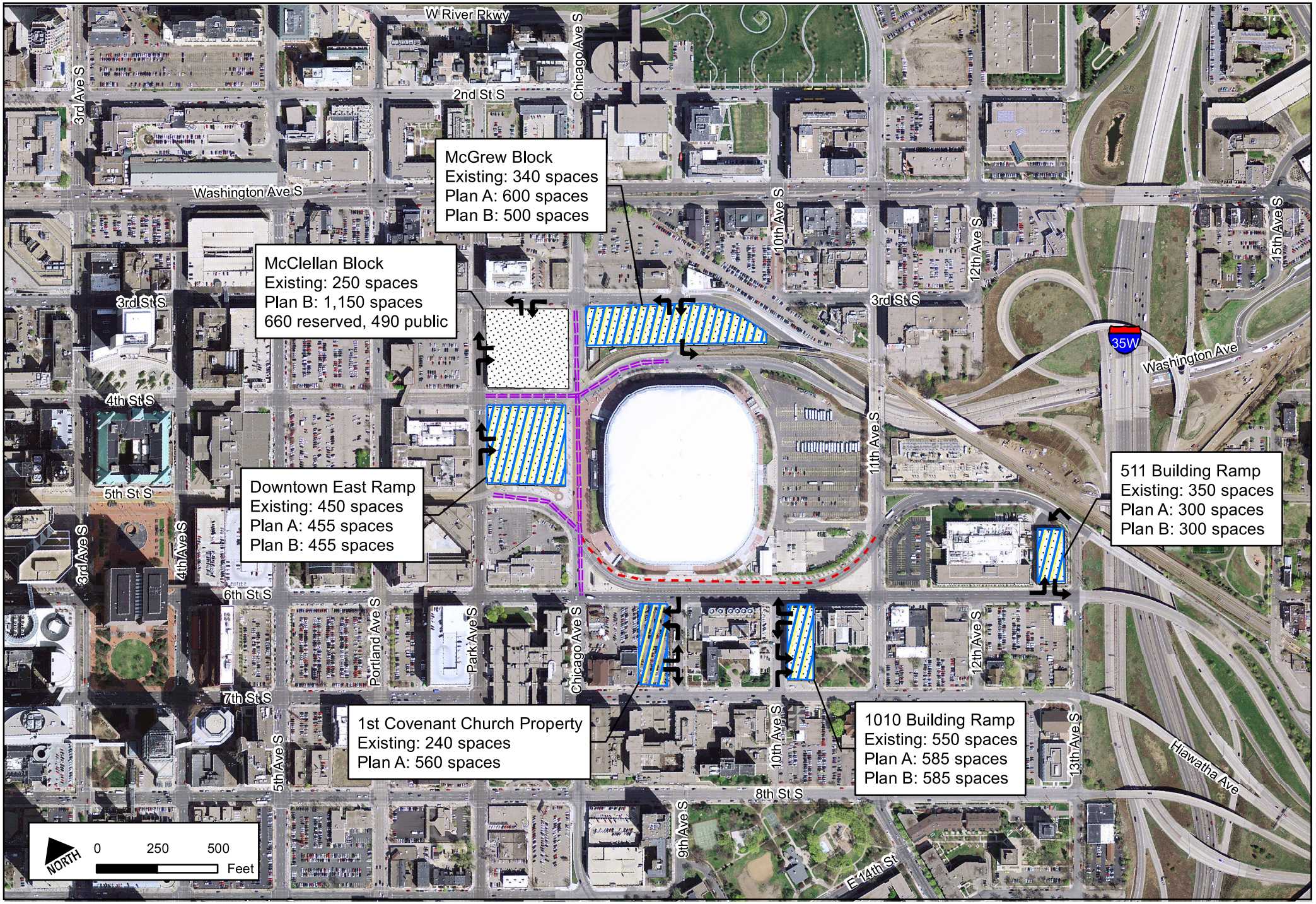
Figure 3.7-7. Proposed Weekday Event Arrival Analysis



Legend

- Intersections to be Analyzed
- Proposed Event Road Closure
- Proposed Permanent Road Closure

Figure 3.7-8. Proposed Park/Portland Weekend Event Arrival Analysis

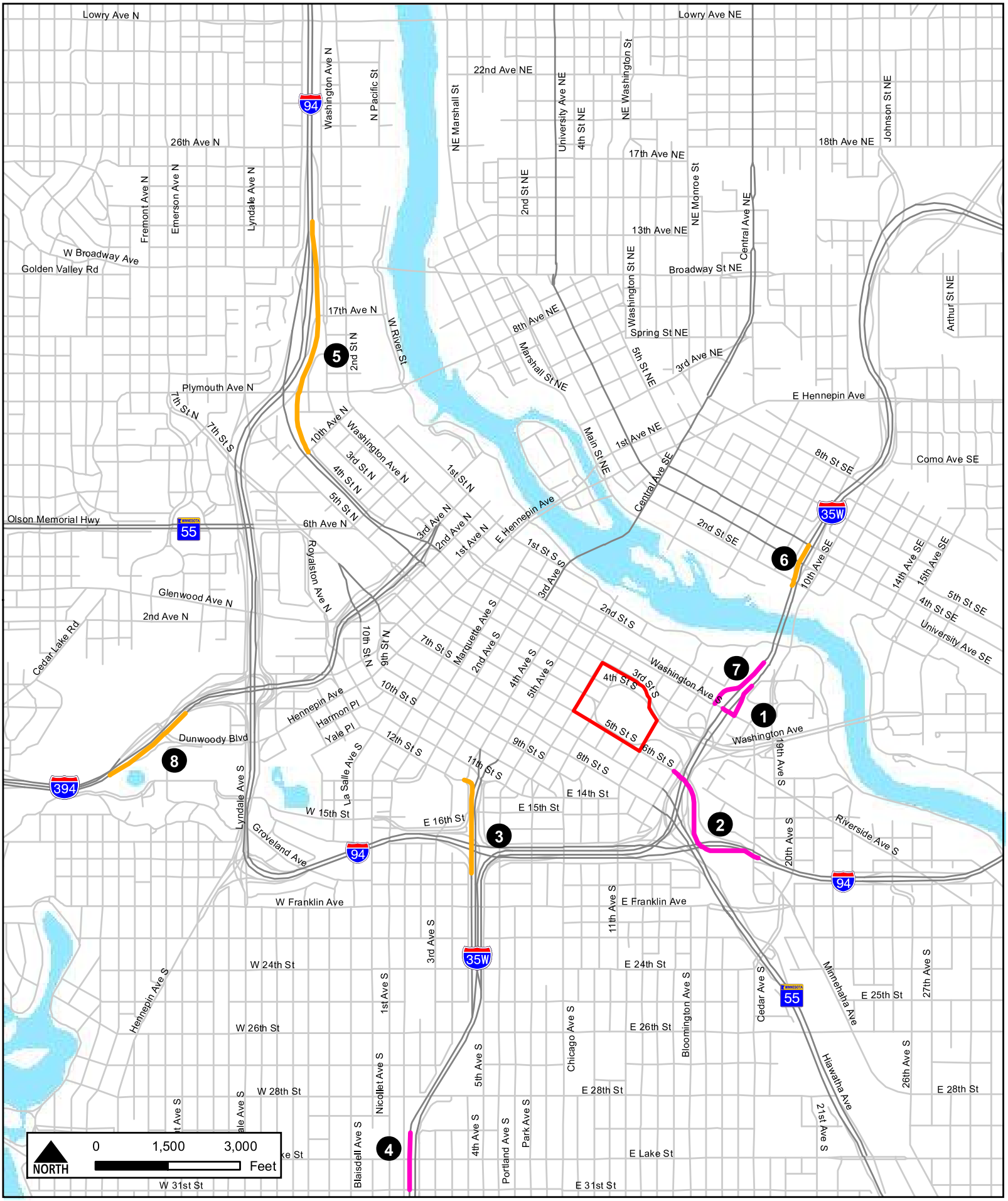


Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT

Legend

- Proposed Event Road Closure
- Proposed Permanent Road Closure
- Reserved Parking Plan A
- Reserved Parking Plan B

Figure 3.7-9. Proposed Reserved Parking Plans

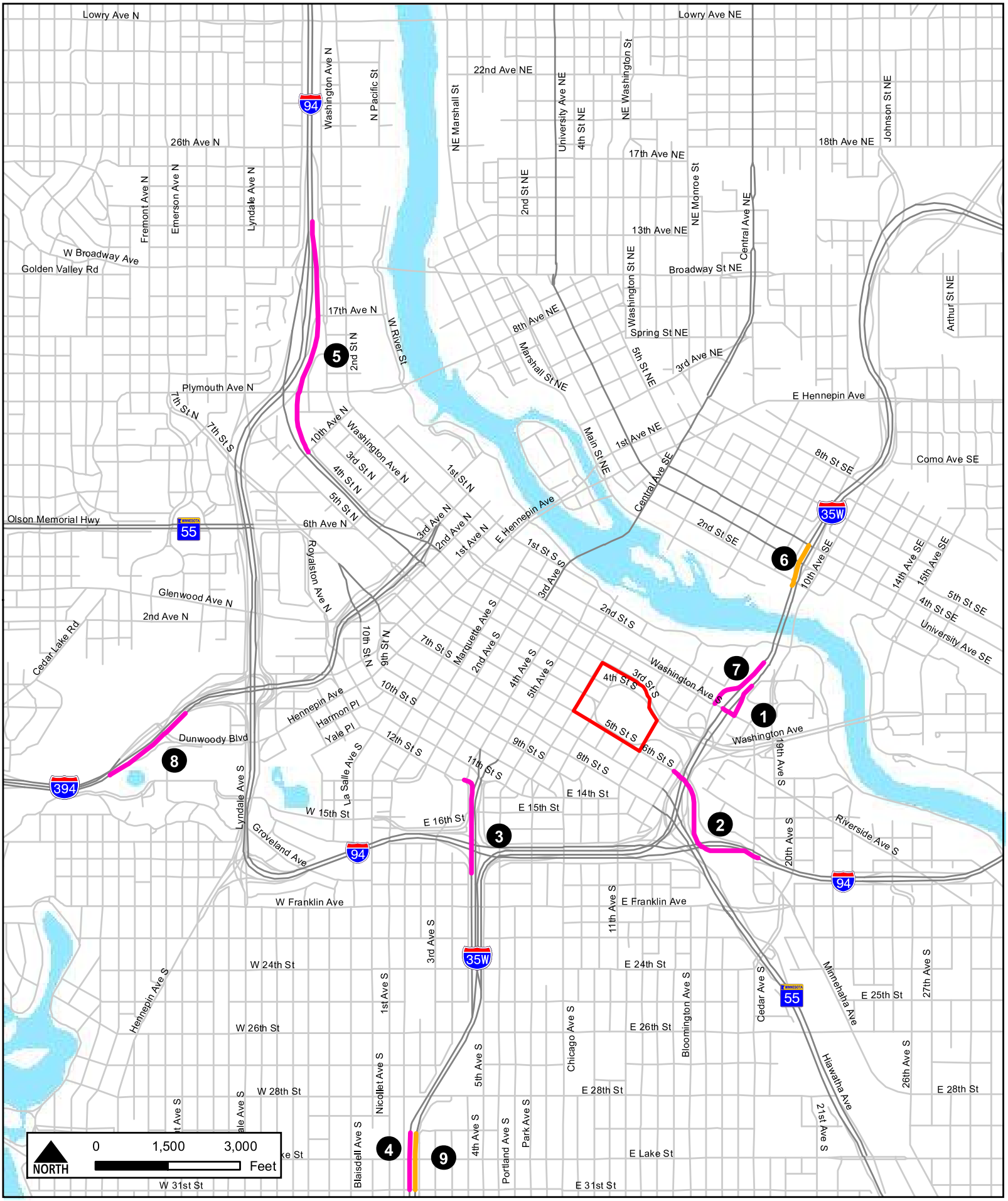


Legend

- Approaching Capacity
- Over Capacity
- Stadium Site Boundary

Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT

Figure 3.7-10. 2017 No Action Event Freeway Traffic Issues

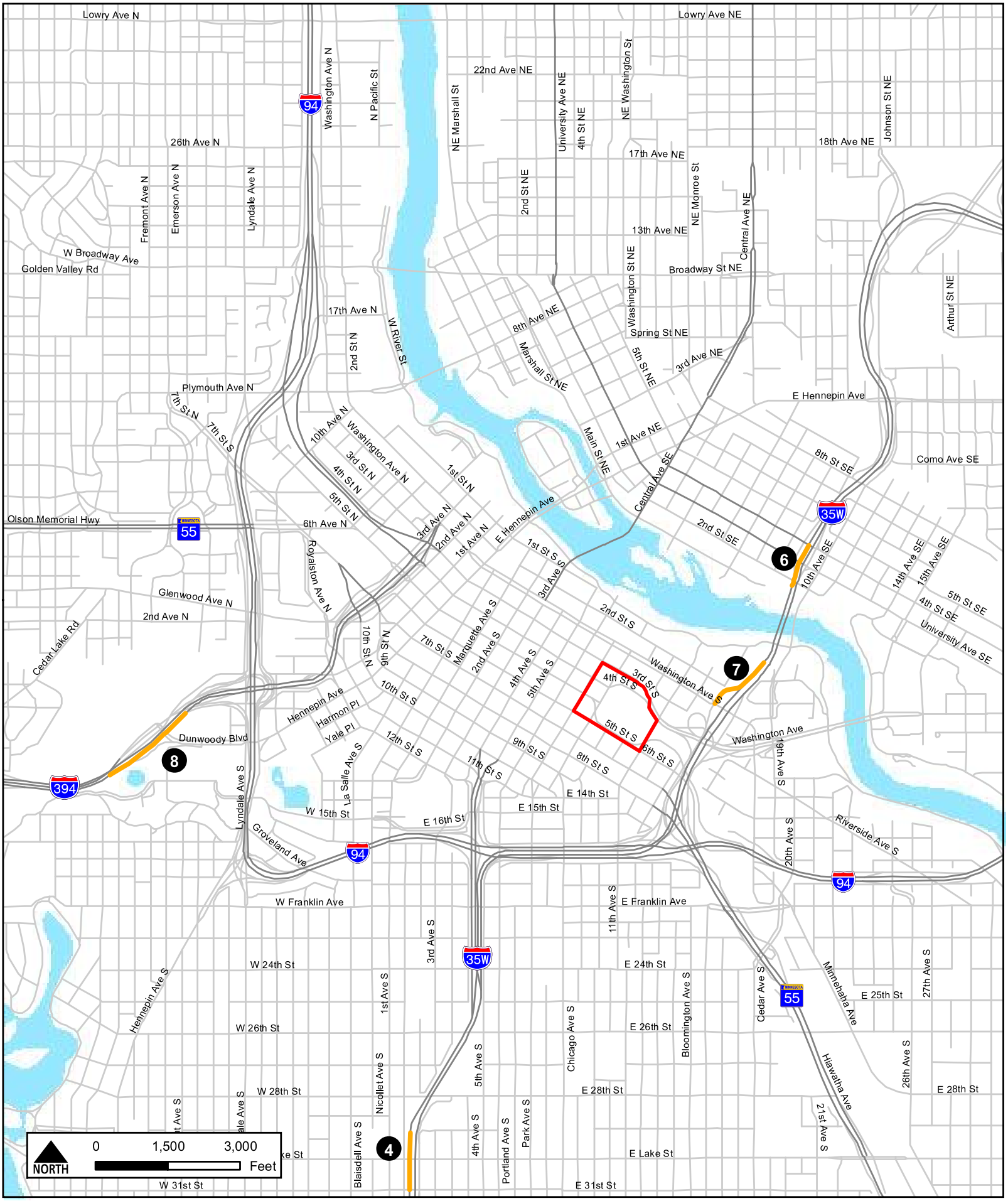


Legend

- Approaching Capacity
- Over Capacity
- Stadium Site Boundary

Figure 3.7-11. 2017 Proposed Project Event Freeway Traffic Issues

Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT

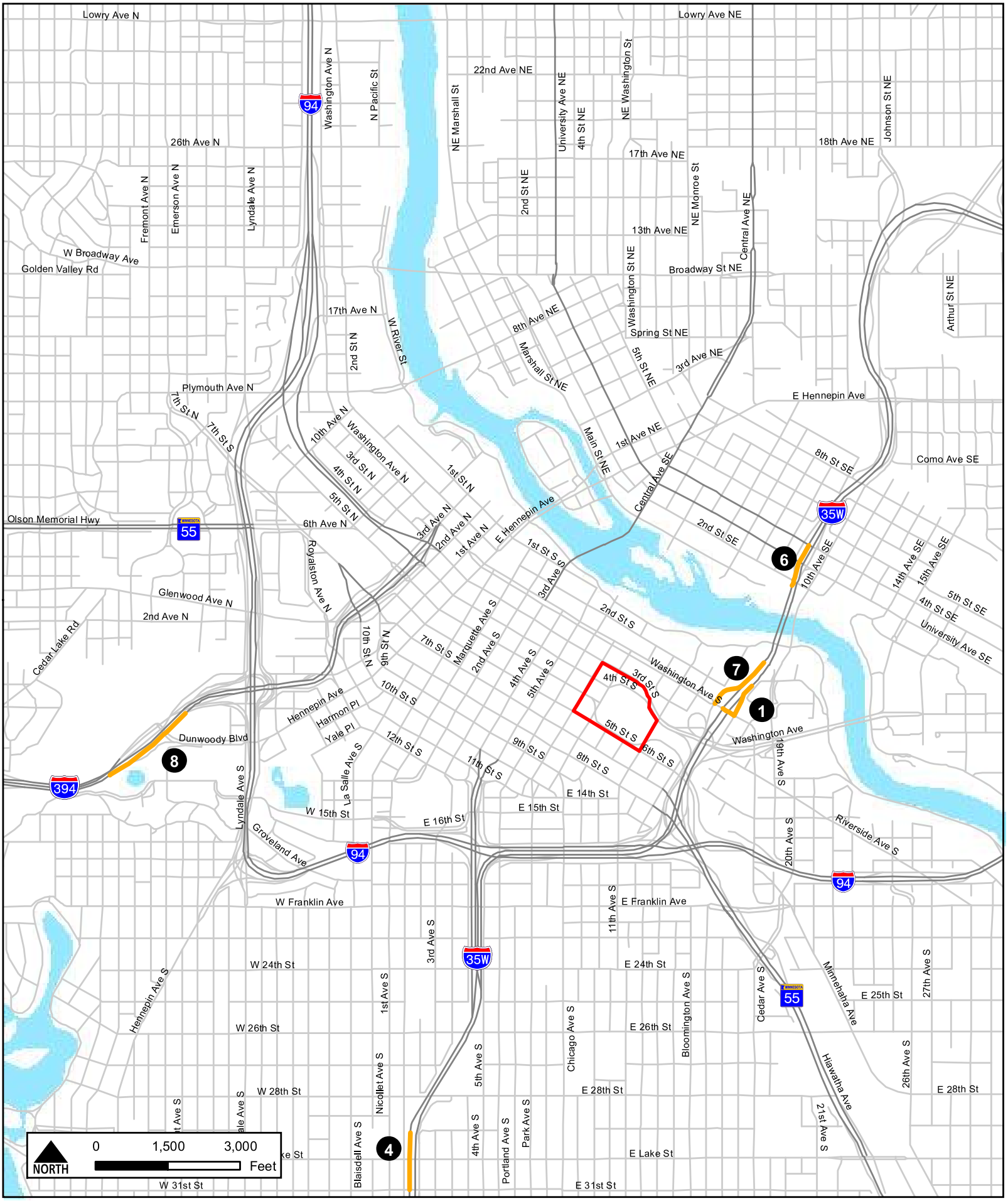


Legend

- Approaching Capacity
- Over Capacity
- Stadium Site Boundary

Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT

Figure 3.7-12. 2030 No Action Event Freeway Traffic Issues

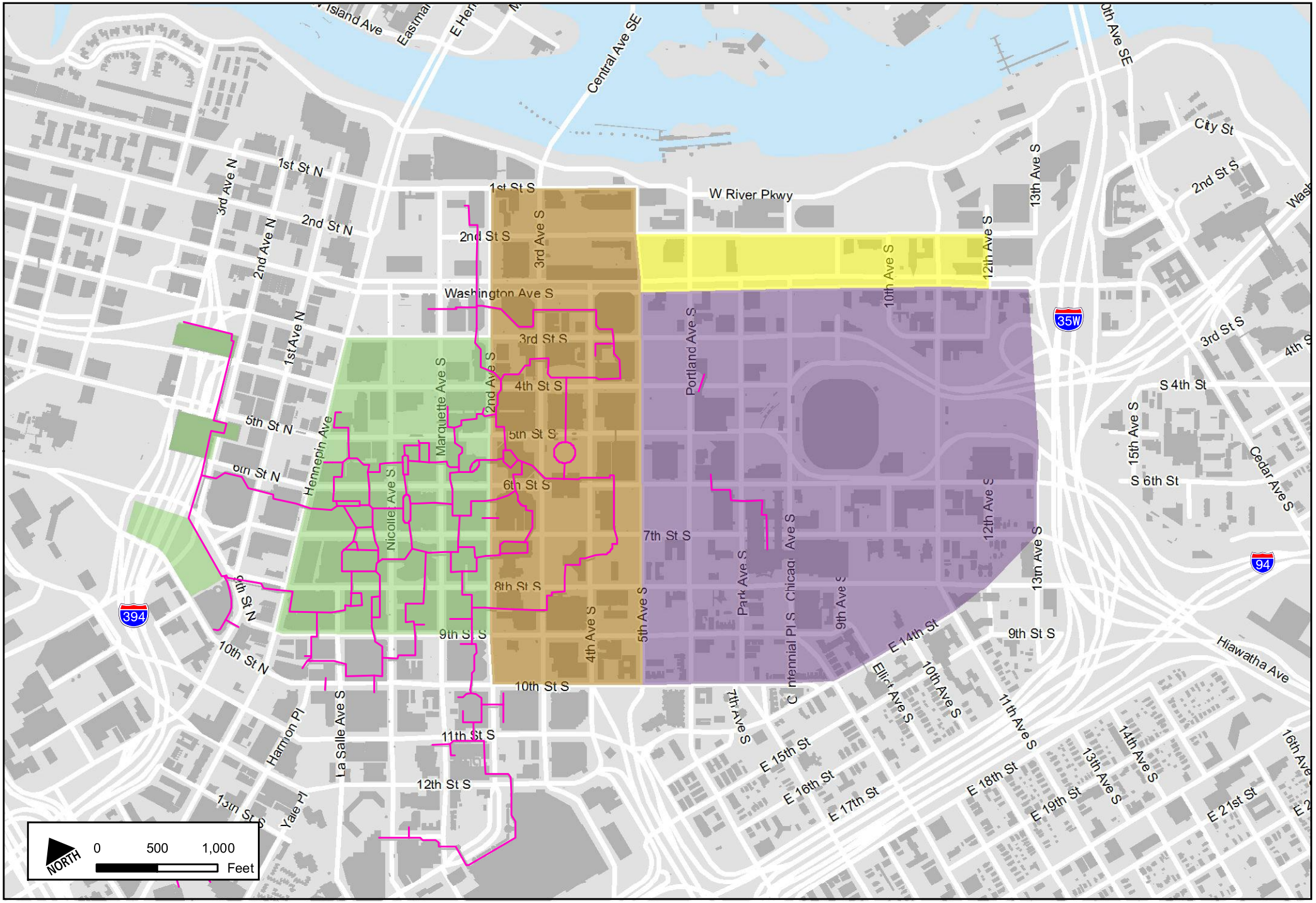


Legend

- Approaching Capacity
- Over Capacity
- Stadium Site Boundary

Figure 3.7-13. 2030 Proposed Project Event Freeway Traffic Issues

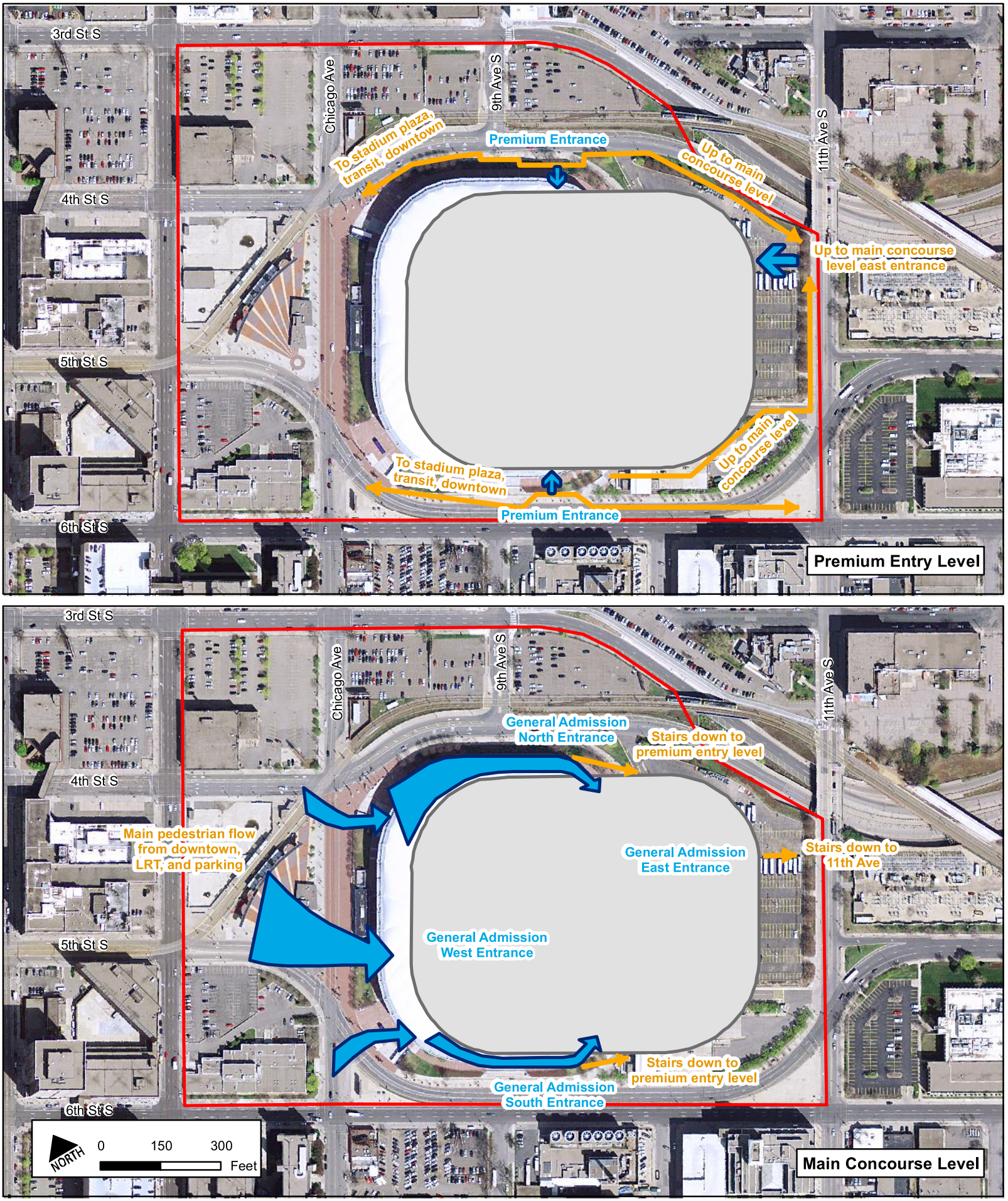
Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT



Legend

- 2nd Ave S to 5th Ave S
- Stadium Parking
- Skyways
- North of Washington Ave S
- West of 2nd Ave S
- Buildings

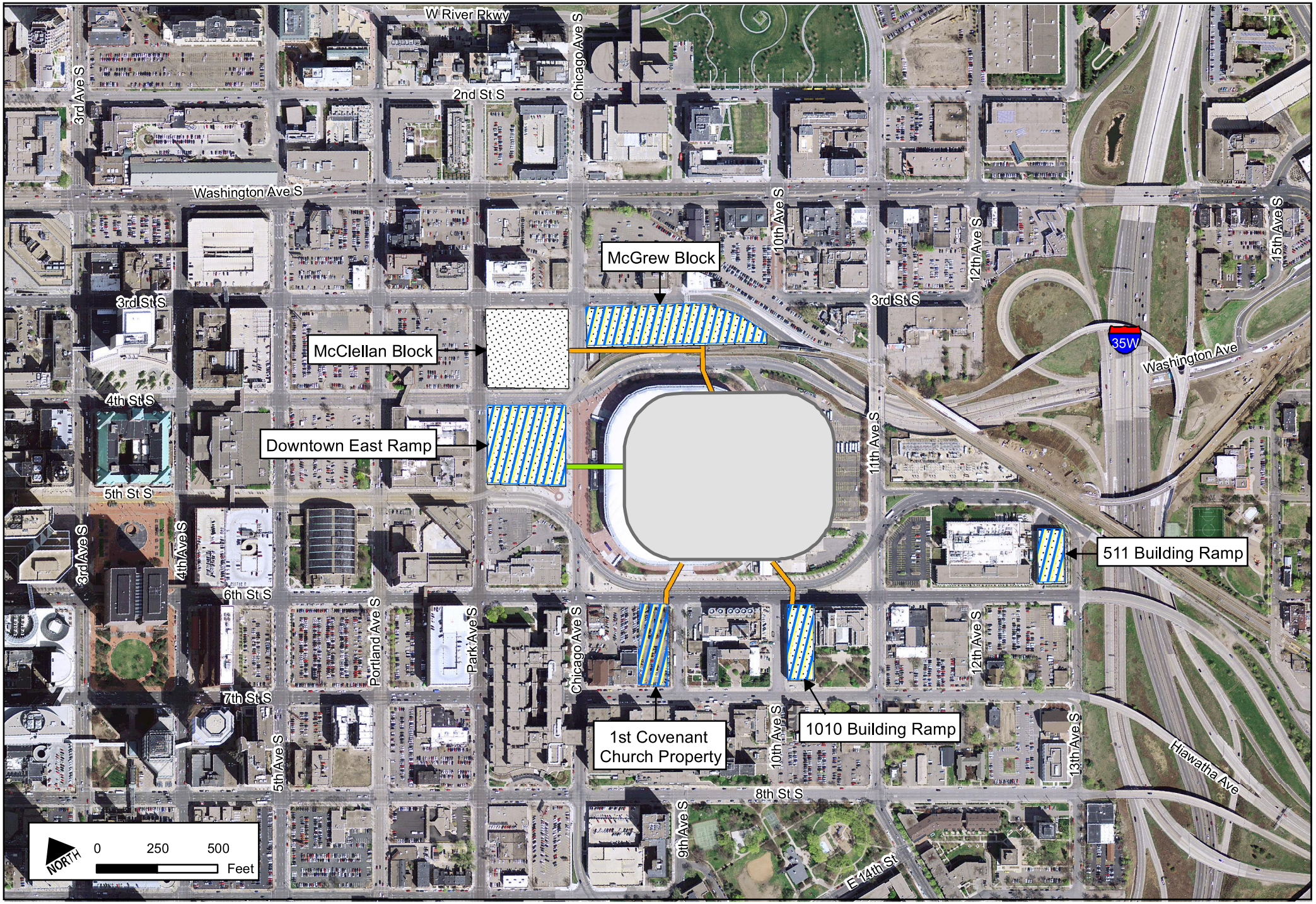
Figure 3.7-14. Parking Zones



Legend

- Stadium Site Boundary
- Approximate Footprint of New Stadium

Figure 3.7-15. At-Grade Pedestrian Access

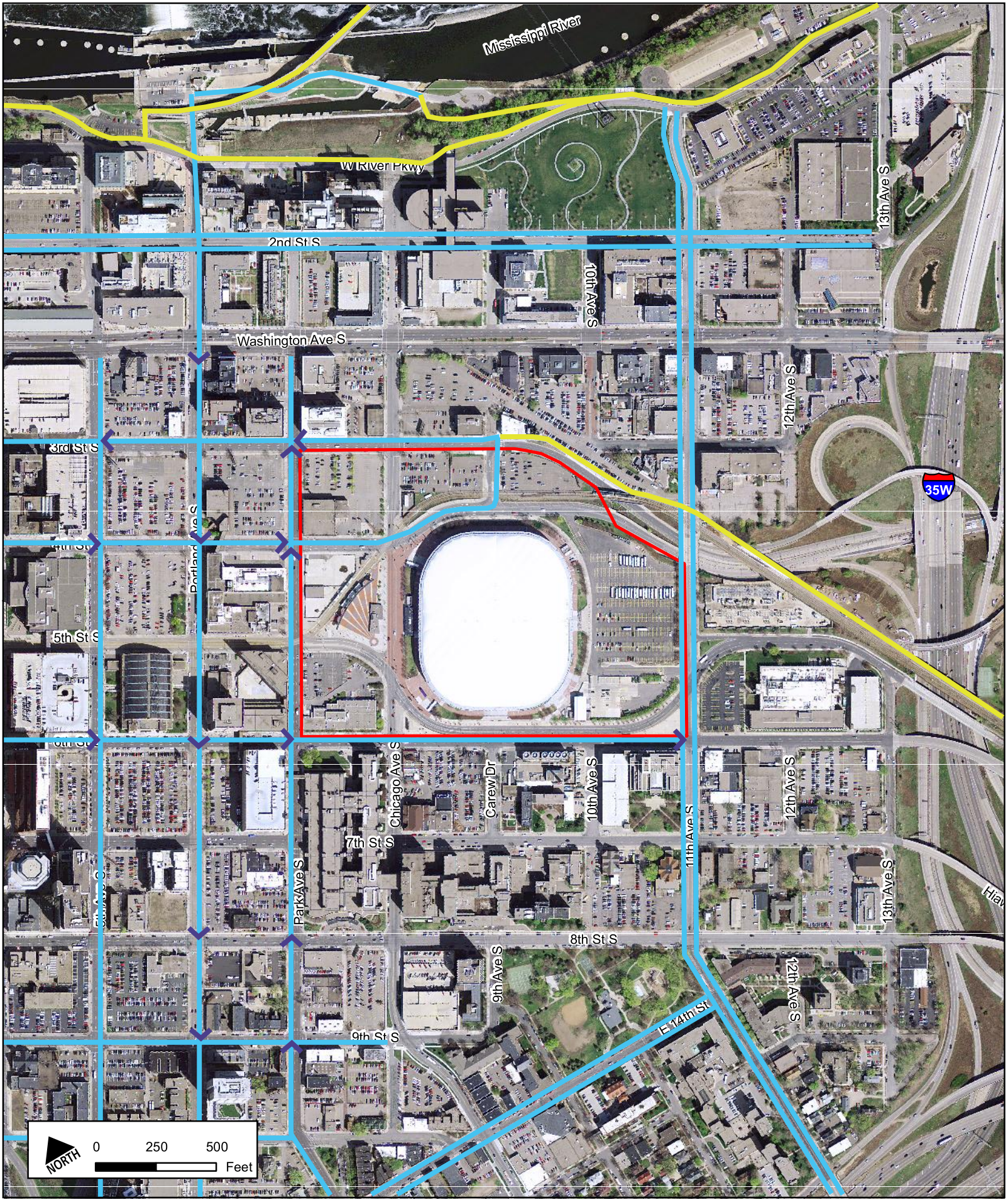


Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT

Legend

- Approximate Footprint of New Stadium
- Reserved Parking Plan A
- Reserved Parking Plan B
- Skyways
- Tunnel

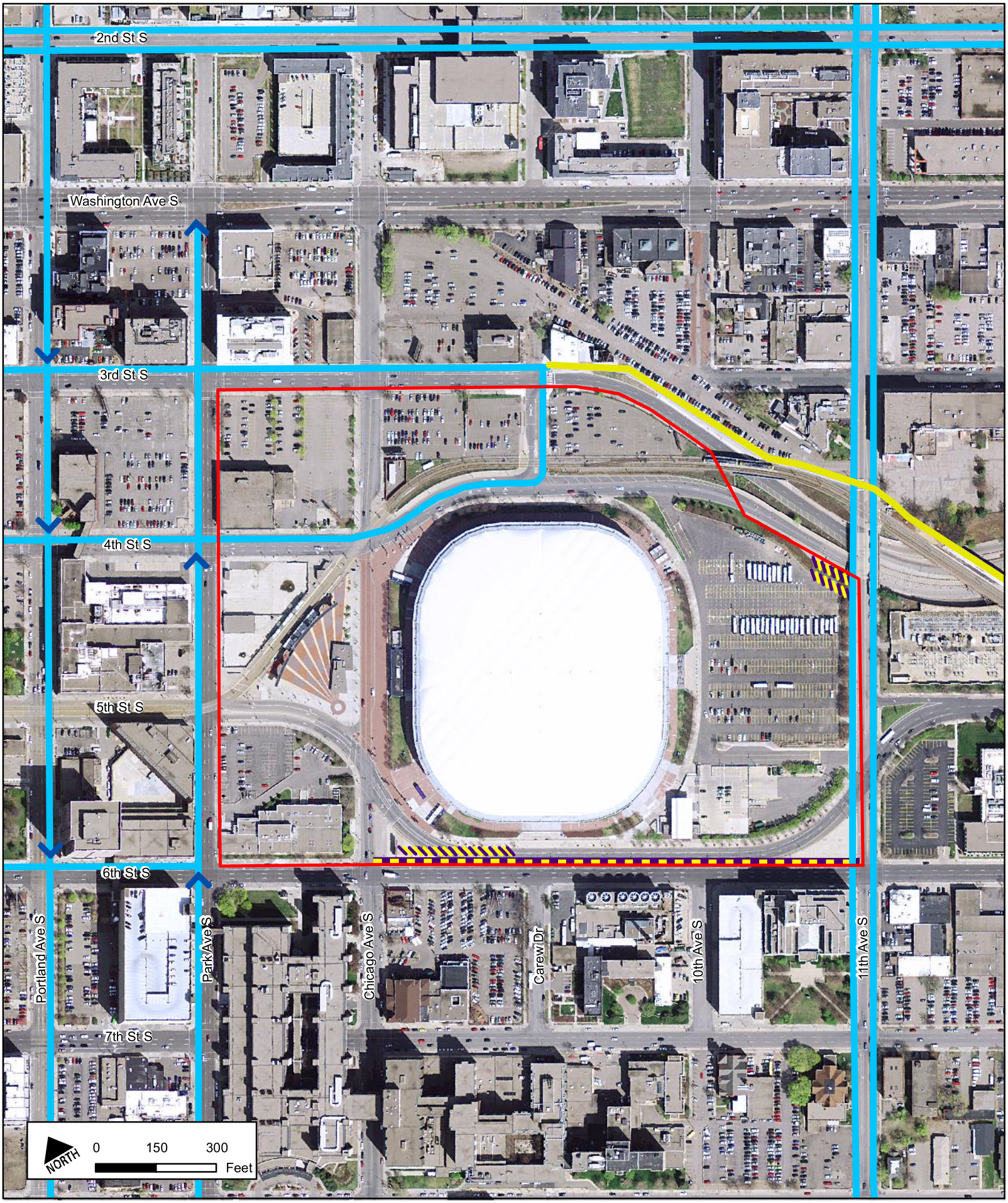
Figure 3.7-16. Grade-Separated Pedestrian Access from Reserved Parking Areas



Legend

- Stadium Site Boundary
- Existing Off-Street Bike Path
- Existing On-Street Bike Lane

Figure 3.7-17. Existing Bicycle Facilities



Legend

- Stadium Site Boundary
- Existing Off-Street Bicycle Path
- Existing On-Street Bicycle Lane
- Proposed Bicycle Parking
- Proposed Bicycle Path

Figure 3.7-18. Proposed Bicycle Facilities

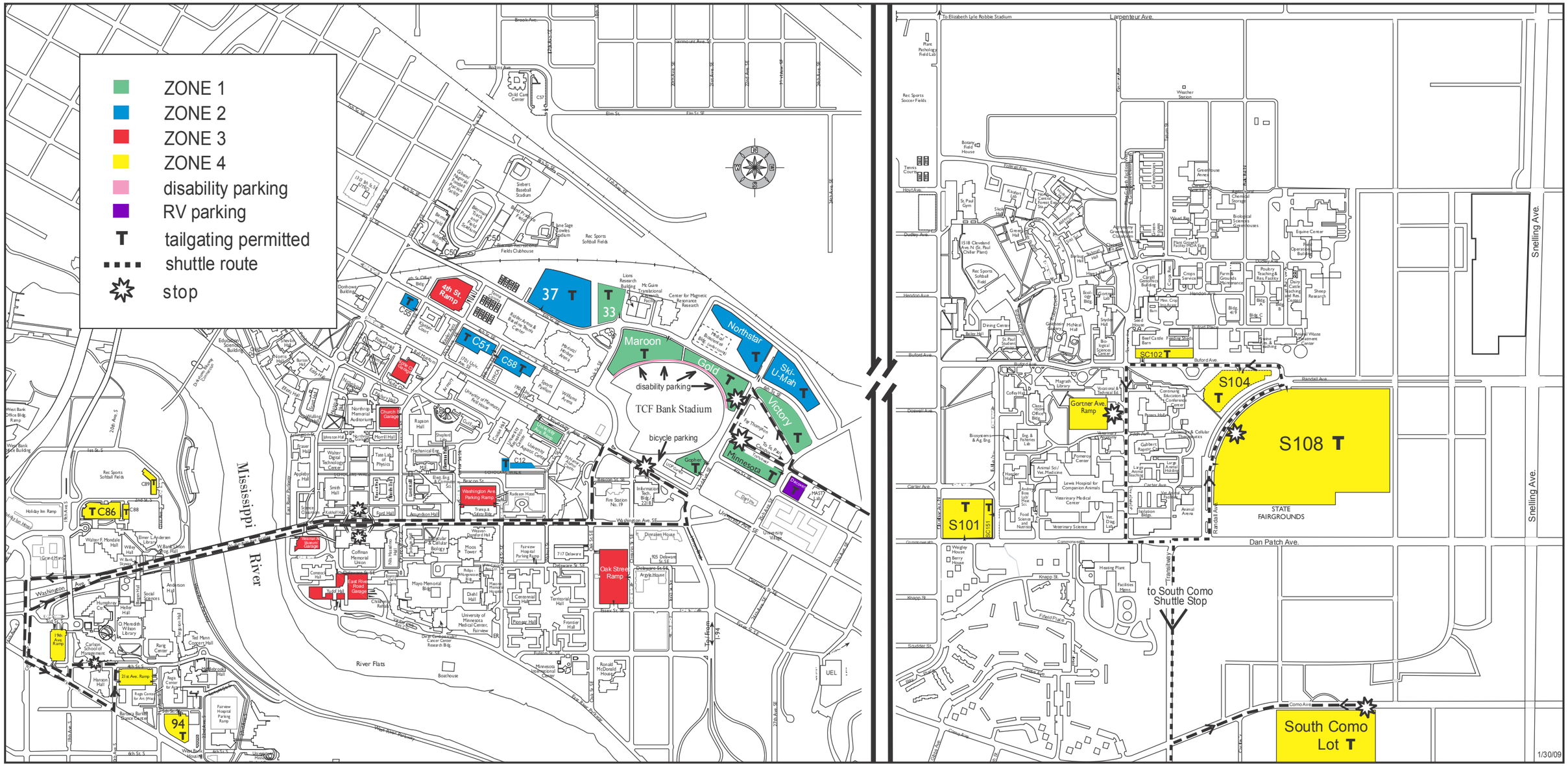
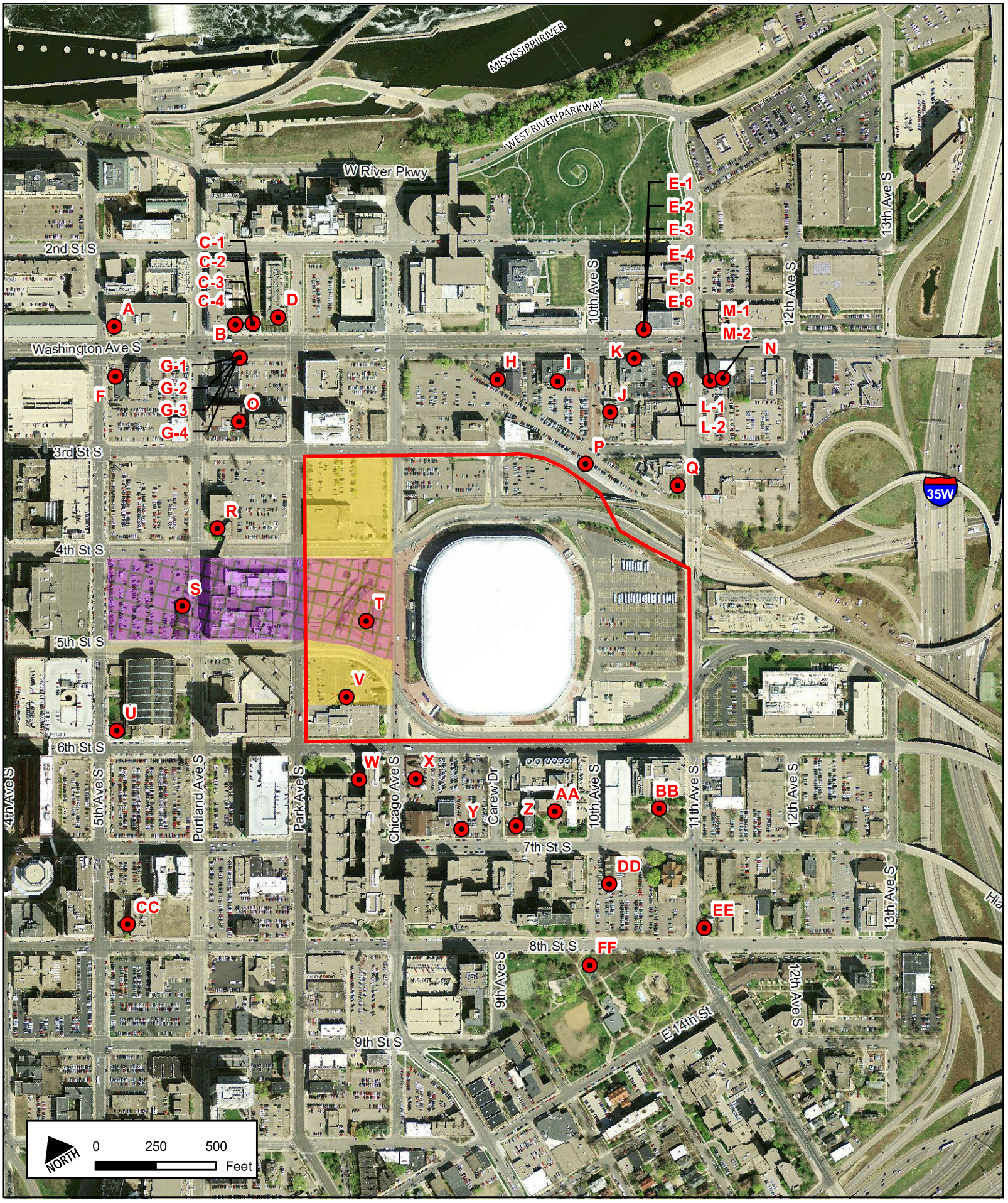


Figure 3.7-19. TCF Bank Stadium Parking Zones

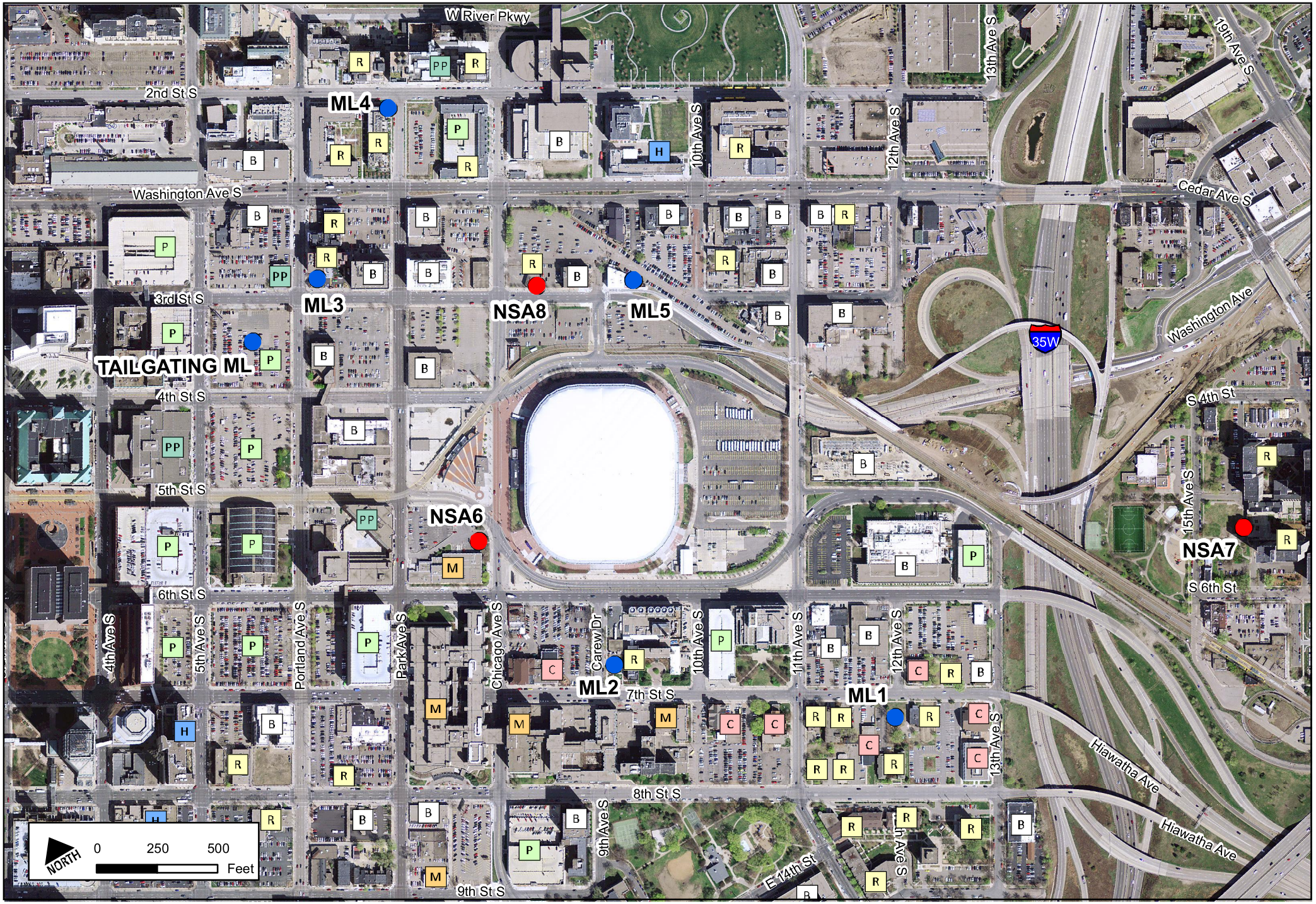
Source: TCF Bank Stadium Transportation Management Plan (July 2009)



Legend

- Noise Receptor Locations
- Stadium Site Boundary
- East/West Alternate Plaza Configuration
- North/South Alternate Plaza Configuration

Figure 3.9-1. Traffic Noise Analysis

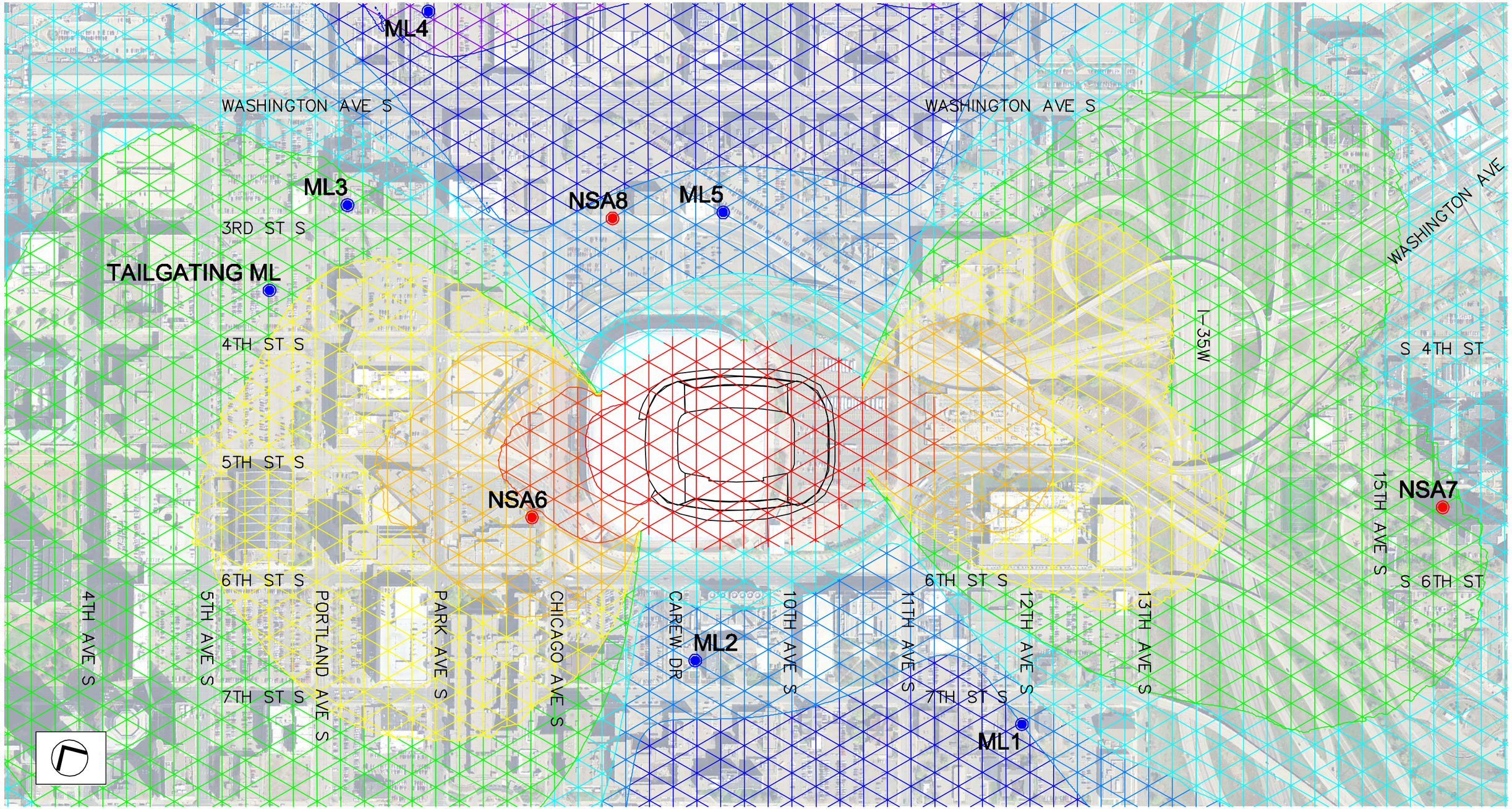


Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT

Legend

- Monitor Locations
- Noise Sensitive Areas
- B Land Use - Business
- C Land Use - Church
- H Land Use - Hotel
- M Land Use - Medical
- P Land Use - Parking
- PP Land Use - Public
- R Land Use - Residential
- U Land Use - University Building

Figure 3.9-2. Noise Measurements and Noise Sensitive Areas



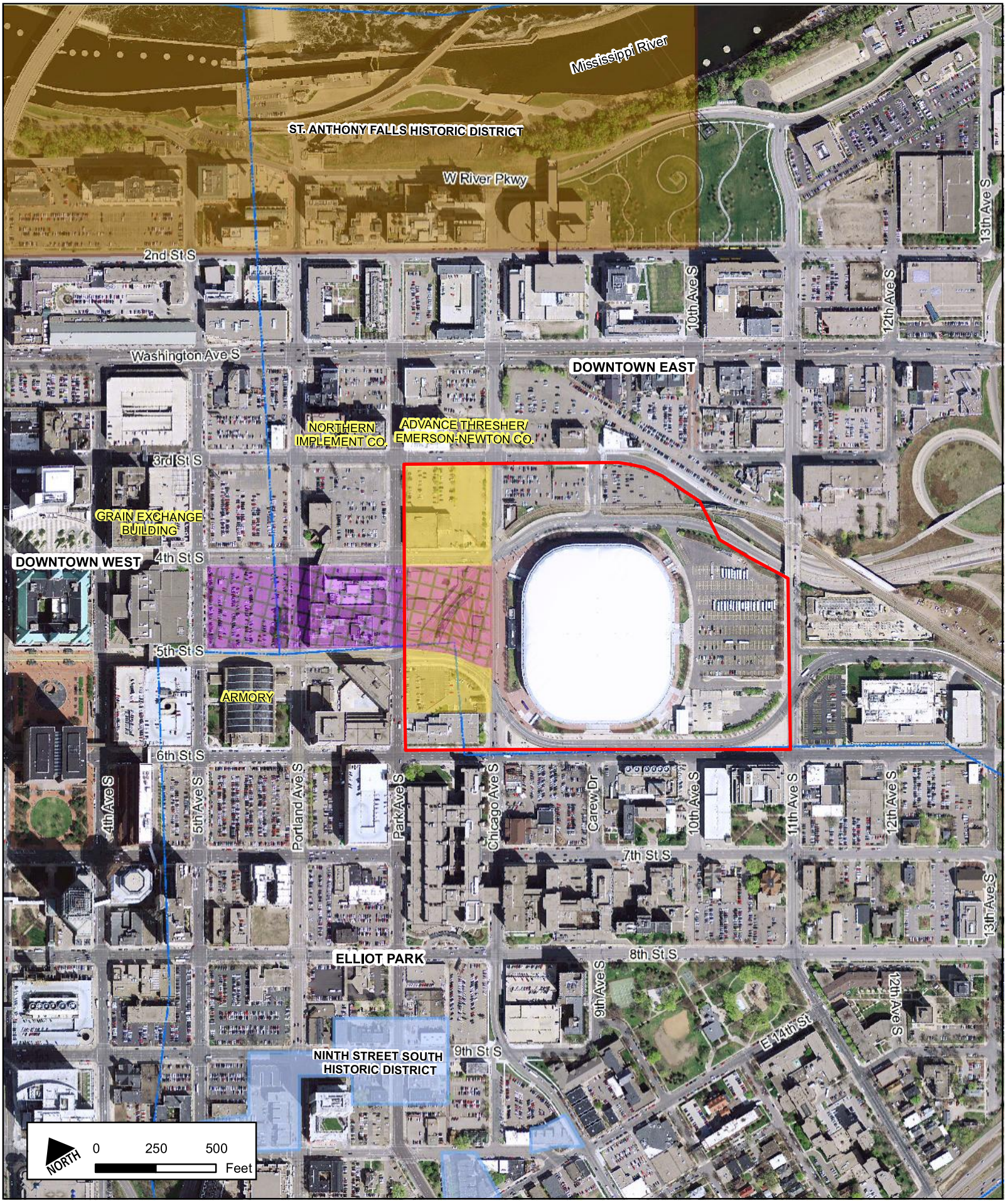
Legend

- MONITOR LOCATIONS
- NOISE SENSITIVE AREAS

- 40–45 dBA
- 45–50 dBA
- 50–55 dBA
- 55–60 dBA
- 60–65 dBA
- 65–70 dBA
- 70–75 dBA
- 75–80 dBA
- 80+ dBA

Minnesota Multi-Purpose Stadium
ENVIRONMENTAL IMPACT STATEMENT

Figure 3.9-3. Stadium Event Noise Levels (dBA L10)



Legend

- Stadium Site Boundary
- East/West Alternate Plaza Configuration
- North/South Alternate Plaza Configuration
- Neighborhoods
- Property Listed on NRHP

Figure 3.10-1. Historic Districts and Buildings

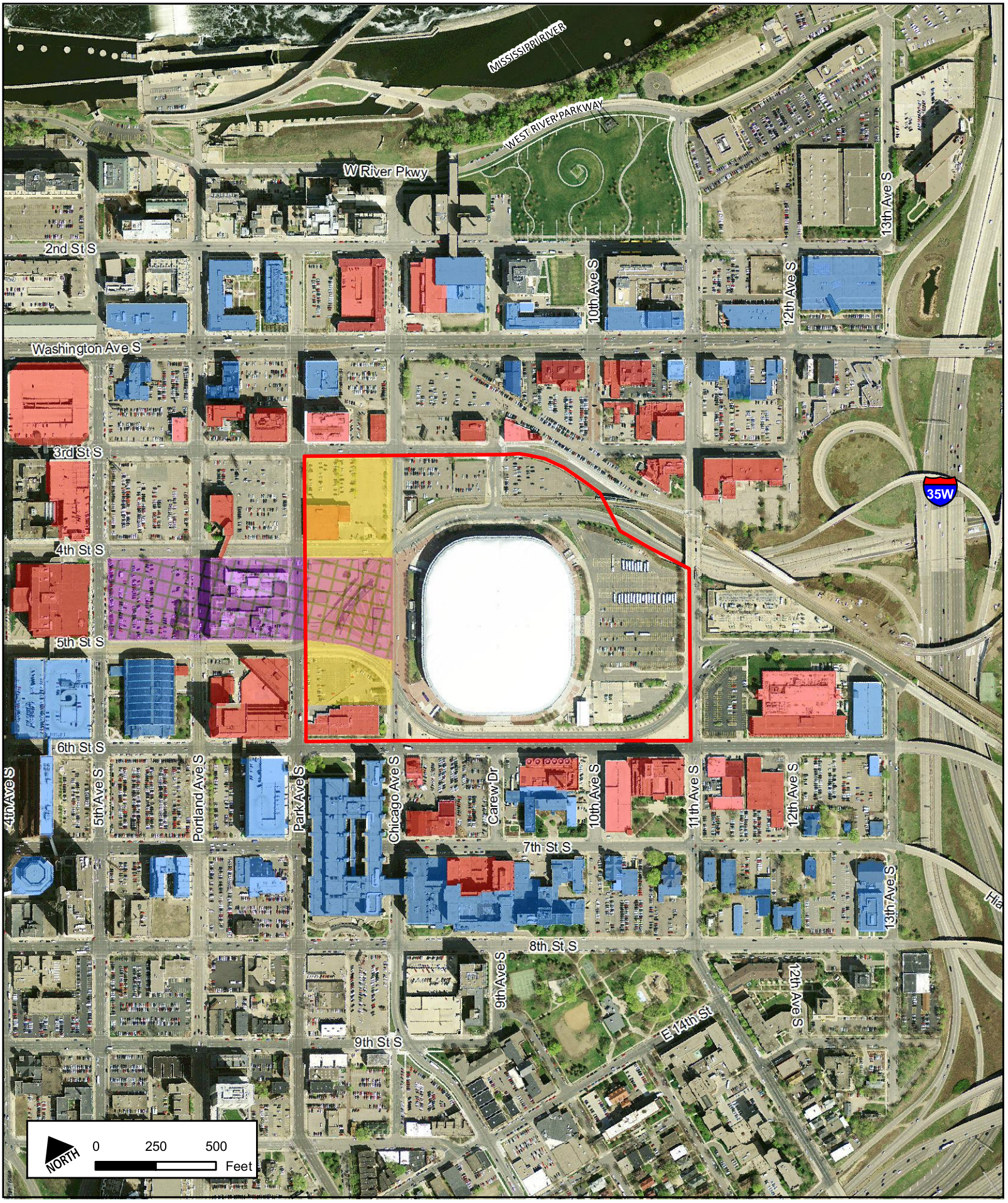


Figure 3.12-1. Views

Legend

- Stadium Site Boundary
- East/West Alternate Plaza Configuration
- North/South Alternate Plaza Configuration
- Direct Views
- Partial Views

(1) From I-35W Southbound

(2) From Cedar-Riverside

(3) From I-35W Northbound

Figure 3.12-2. Visual Impacts
Views of the Downtown Skyline

4. Public Involvement

4.1 Scoping Decision Document

Consistent with the requirements of Minnesota Rule 4410.2100, Subp. 3 (Scoping Period), the public was informed when the Scoping Environmental Assessment Worksheet (EAW)/Draft Scoping Decision Document (SDD) became available for public review and comment on October 1, 2012. A copy of the document was available by request or could be reviewed at the MSFA Office, the Minneapolis Public Library, or the Legislative Reference Library in St. Paul. A public open house was held October 23, 2012, from 5:00-7:00 pm at the Hubert H. Humphrey Metrodome – Halsey Hall Room. Forty individuals signed in at the meeting. The Scoping EAW/Draft SDD, as well as information presented at the public open house, is also available on the MSFA website (www.msfa.com).

An outreach effort was used to solicit public and agency comments on the Proposed Project during the formal scoping period, which extended from October 1 to October 31, 2012. Meeting announcements were emailed to the Stadium Implementation Committee, 12 surrounding neighborhood organizations, seven downtown business organizations, and 28 agencies and organizations that received the Scoping EAW/Draft SDD. Press releases were also sent on October 1 and October 19, 2012, to approximately 60 reporters and major news outlets. Legal notices were posted in the Star Tribune newspaper and the Finance & Commerce newspaper. The open house materials may be found on the MSFA website (www.msfa.com).

Comments were received in writing by email, US mail, or submittal directly to the MSFA at the public open house. Verbal comments were also received at the public open house and were transcribed by a court reporter. These comments were responded to in the Final SDD, which was published in the *EQB Monitor* and distributed on December 10, 2012.

4.2 Draft Environmental Impact Statement

Throughout the EIS process, the MSFA has been coordinating with various agencies and jurisdictions to ensure proper processes are followed. The ongoing coordination and communication with these organizations provides valuable input and guidance. Coordination has taken place with organizations including the Minnesota Department of Transportation, Minnesota Pollution Control Agency, Metropolitan Council/Metro Transit, Hennepin County, City of Minneapolis, and the University of Minnesota.

A notice of the availability of the Draft EIS will be published in the *EQB Monitor* on April 29, 2013, and in local media sources. The Draft EIS will be circulated for a public comment period running from April 29 to June 6, 2013. In addition, a public meeting will be held during the comment period on the Draft EIS. The Draft EIS will be distributed to the Environmental Quality Board (EQB) distribution list and posted on the MSFA website.

Comments received during the Draft EIS comment period will be evaluated in preparing the Final EIS. Following publication of the Final EIS, the MSFA will determine its adequacy consistent with MEPA, Minn. Stat. Chpt. 116D. Notification of the MSFA's adequacy determination will be published in the *EQB Monitor*, sent to the EQB distribution list, and provided to local media sources.

5. Permits and Approvals

Table 5.1-1 identifies known federal, state, and local permits and approvals anticipated for the Proposed Project, as well as current status. The Stadium legislation states that "the environmental impact statement must be determined to be adequate before commencing work on the foundation of the stadium, but the stadium and stadium infrastructure may otherwise be started and all preliminary and final government decisions and actions may be made and taken including, but not limited to, acquiring land; obtaining financing; granting permits or other land use approvals; entering into grant, lease, or use agreements; or preparing the site or related stadium infrastructure prior to a determination of adequacy of the environmental impact statement" (Minn. Stat. § 473J.17, subd.3).

5.1 Coordination and Permits Required

Coordination will take place with a number of agencies as part of the permitting process as listed in **Table 5.1-1**.

Table 5.1-1. Permits and Approvals Required

Unit of Government	Type of Application	Status
Federal		
Federal Aviation Administration	Airspace hazard permit (for any structures more than 200 feet above ground level)	To be applied for, if needed
State		
Minnesota Department of Health	Abandonment of Water Wells	To be applied for, if needed
	Water Main Installation Permit	To be applied for
	Drainage Permit	To be applied for
Minnesota Department of Natural Resources	Groundwater Appropriation Permit	To be applied for, if needed
Minnesota Department of Transportation	Permit for any work within MnDOT right-of-way	To be applied for, if needed
	Drainage Permit	To be applied for, if needed
Minnesota Historical Society	Minnesota Historic Sites Act Minnesota Field Archaeology Act	Provisions will be met during construction, as applicable
Minnesota Pollution Control Agency	NPDES/SDS Construction Stormwater Permit	To be applied for
	Sanitary Sewer Extension Permit	To be applied for
	Soil and Groundwater Remediation Plan Approval	To be applied for, if needed
	Storage Tank Registration	To be applied for
Minnesota Sports Facilities Authority	Adequacy Determination	In process
Regional		
Metropolitan Council	Sanitary Sewer Extension Permit	To be applied for, if needed
Middle Mississippi River Watershed District (which defers to City of Minneapolis for permitting)	Stormwater management plan approval	To be applied for

Unit of Government	Type of Application	Status
Local		
City of Minneapolis	Building permits	To be applied for
	Demolition permit	To be applied for
	Emergency Generator Fuel Storage Permit	To be applied for
	Erosion and Sedimentation Control Plan Approval and Grading Permit	To be applied for
	Approval of Street Vacation (5th Street)	To be applied for
	Design Plan Review and Approval	To be applied for

Appendix A
Stadium Legislation

CHAPTER 299–H.F.No. 2958

An act relating to stadiums; providing for a new National Football League stadium in Minnesota; establishing a Minnesota Sports Facilities Authority; authorizing the sale and issuance of state appropriation bonds; abolishing the Metropolitan Sports Facilities Commission; providing for use of certain local tax revenue; providing for electronic pull-tab games, electronic linked bingo games, and sports-themed tipboard games; providing for the conditional imposition of certain taxes and collection of other revenues; modifying certain rates of tax on lawful gambling; appropriating money; amending Minnesota Statutes 2010, sections 3.971, subdivision 6; 3.9741, by adding a subdivision; 297A.71, by adding subdivisions; 297E.01, subdivisions 7, 8, 9; 297E.02, subdivisions 1, 3, 6, 7, 10, 11, by adding a subdivision; 297E.13, subdivision 5; 349.12, subdivisions 3b, 3c, 5, 6a, 12a, 18, 25, 25b, 25c, 25d, 29, 31, 32, 34, 35, by adding subdivisions; 349.13; 349.151, subdivisions 4b, 4c, by adding subdivisions; 349.155, subdivisions 3, 4; 349.161, subdivisions 1, 5; 349.162, subdivision 5; 349.163, subdivisions 1, 5, 6; 349.1635, subdivisions 2, 3, by adding a subdivision; 349.165, subdivision 2; 349.17, subdivisions 6, 7, 8, by adding a subdivision; 349.1711, subdivisions 1, 2; 349.1721; 349.18, subdivision 1; 349.19, subdivisions 2, 3, 5, 10; 349.211, subdivisions 1a, 2c; 352.01, subdivision 2a; Minnesota Statutes 2011 Supplement, sections 10A.01, subdivision 35; 297A.75, subdivisions 1, 2, 3; 340A.404, subdivision 1; Laws 1986, chapter 396, sections 4, as amended; 5, as amended; proposing coding for new law in Minnesota Statutes, chapters 3; 16A; 245; 297A; 297E; 349A; proposing coding for new law as Minnesota Statutes, chapter 473J; repealing Minnesota Statutes 2010, sections 297E.02, subdivision 4; 349.15, subdivision 3; 349.19, subdivision 2a.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

ARTICLE 1

MINNESOTA SPORTS FACILITIES AUTHORITY

Section 1. **[3.8842] LEGISLATIVE COMMISSION ON MINNESOTA SPORTS FACILITIES.**

Subdivision 1. **Purpose.** The Legislative Commission on Minnesota Sports Facilities is established by and under the authority of the Legislative Coordinating Commission to oversee the Minnesota Sports Facilities Authority's operating and capital budgets. The legislature finds that continuous legislative review of the financial management of the authority is necessary to promote fiscal responsibility and good management, and strengthen the accountability of the authority. The commission is charged with:

(1) providing financial oversight of the authority as described in subdivision 8;

(2) adoption of a statewide authority structure for the operation and management of sports facilities and entertainment venues under the jurisdiction of the authority. The authority membership shall represent the interests of both the metropolitan area and greater Minnesota; and

(3) creating a comprehensive management plan that alleviates booking and scheduling concerns regarding the sports facilities and entertainment venues under the jurisdiction of the authority.

Subd. 2. **Membership.** The commission consists of three senators appointed by the senate majority leader, three senators appointed by the senate minority leader, three state representatives appointed by the speaker of the house, and three state representatives appointed by the house minority leader. The appointing authorities must ensure balanced geographic representation. Each appointing authority must make appointments as soon as possible after the opening of the next regular session of the legislature in each odd-numbered year.

Subd. 3. **Terms; vacancies.** Members of the commission serve for a two-year term beginning upon appointment and expiring upon appointment of a successor after the opening of the next regular session of the legislature in the odd-numbered year. A vacancy in the membership of the commission must be filled for the unexpired term in a manner that will preserve the representation established by this section.

Subd. 4. **Chair.** The commission must meet as soon as practicable after members are appointed in each odd-numbered year to elect its chair and other officers as it may determine necessary. A chair serves a two-year term, expiring in the odd-numbered year after a successor is elected. The chair must alternate biennially between the senate and the house of representatives.

Subd. 5. **Compensation.** Members serve without compensation but may be reimbursed for their reasonable expenses as members of the legislature.

Subd. 6. **Staff.** Legislative staff must provide administrative and research assistance to the commission.

Subd. 7. **Meetings; procedures.** The commission meets at least semiannually. If there is a quorum, the commission may take action by a simple majority vote of commission members present.

Subd. 8. **Powers; duties; Minnesota Sports Facilities Authority, budget oversight.** The commission must monitor, review, and make recommendations to the authority and to the legislature for the following calendar year on:

(1) any proposed increases in the rate or dollar amount of tax;

(2) any proposed increases in the debt of the authority;

(3) the overall work and role of the authority;

(4) the authority's proposed operating and capital budgets;

(5) the authority's implementation of the operating and capital budgets; and

(6) any other topics as deemed necessary by the commission to fulfill the purpose described in subdivision 1.

Subd. 9. **Report.** The commission shall report on January 15 of the even-numbered year on the effectiveness and future prospects of the commission.

Sec. 2. Minnesota Statutes 2010, section 3.971, subdivision 6, is amended to read:

Subd. 6. **Financial audits.** The legislative auditor shall audit the financial statements of the state of Minnesota required by section 16A.50 and, as resources permit, shall audit Minnesota State Colleges and Universities, the University of Minnesota, state agencies, departments, boards, commissions, courts, and other state organizations subject to audit by the legislative auditor, including the State Agricultural Society, Agricultural Utilization Research Institute, Enterprise Minnesota, Inc., Minnesota Historical Society, Labor Interpretive Center, Minnesota Partnership for Action Against Tobacco, Metropolitan Sports Facilities Commission, Minnesota Sports Facilities Authority, Metropolitan Airports Commission, and Metropolitan Mosquito Control District. Financial audits must be conducted according to generally accepted government auditing standards. The legislative auditor shall see that all provisions of law respecting the appropriate and economic use of public funds are complied with and may, as part of a financial audit or separately, investigate allegations of noncompliance.

Sec. 3. Minnesota Statutes 2010, section 3.9741, is amended by adding a subdivision to read:

Subd. 4. **Minnesota Sports Facilities Authority.** Upon the audit of the financial accounts and affairs of the Minnesota Sports Facilities Authority, the authority is liable to the state for the total cost and expenses of the audit, including the salaries paid to the examiners while actually engaged in making the examination. The legislative auditor may bill the authority either monthly or at the completion of the audit. All collections received for the audits must be deposited in the general fund.

Sec. 4. Minnesota Statutes 2011 Supplement, section 10A.01, subdivision 35, is amended to read:

Subd. 35. **Public official.** "Public official" means any:

(1) member of the legislature;

(2) individual employed by the legislature as secretary of the senate, legislative auditor, chief clerk of the house of representatives, revisor of statutes, or researcher, legislative analyst, or attorney in the Office of Senate Counsel and Research or House Research;

(3) constitutional officer in the executive branch and the officer's chief administrative deputy;

(4) solicitor general or deputy, assistant, or special assistant attorney general;

(5) commissioner, deputy commissioner, or assistant commissioner of any state department or agency as listed in section 15.01 or 15.06, or the state chief information officer;

(6) member, chief administrative officer, or deputy chief administrative officer of a state board or commission that has either the power to adopt, amend, or repeal rules under chapter 14, or the power to adjudicate contested cases or appeals under chapter 14;

(7) individual employed in the executive branch who is authorized to adopt, amend, or repeal rules under chapter 14 or adjudicate contested cases under chapter 14;

(8) executive director of the State Board of Investment;

(9) deputy of any official listed in clauses (7) and (8);

(10) judge of the Workers' Compensation Court of Appeals;

(11) administrative law judge or compensation judge in the State Office of Administrative Hearings or unemployment law judge in the Department of Employment and Economic Development;

(12) member, regional administrator, division director, general counsel, or operations manager of the Metropolitan Council;

(13) member or chief administrator of a metropolitan agency;

(14) director of the Division of Alcohol and Gambling Enforcement in the Department of Public Safety;

(15) member or executive director of the Higher Education Facilities Authority;

(16) member of the board of directors or president of Enterprise Minnesota, Inc.;

(17) member of the board of directors or executive director of the Minnesota State High School League;

(18) member of the Minnesota Ballpark Authority established in section 473.755;

(19) citizen member of the Legislative-Citizen Commission on Minnesota Resources;

(20) manager of a watershed district, or member of a watershed management organization as defined under section 103B.205, subdivision 13;

(21) supervisor of a soil and water conservation district;

(22) director of Explore Minnesota Tourism;

(23) citizen member of the Lessard-Sams Outdoor Heritage Council established in section 97A.056; ~~or~~

(24) ~~a~~ citizen member of the Clean Water Council established in section 114D.30~~.~~; or

(25) member or chief executive of the Minnesota Sports Facilities Authority established in section 473J.07.

Sec. 5. **[16A.726] SPORTS FACILITIES TRANSFERS; APPROPRIATIONS.**

(a) If state appropriation bonds have not been issued under section 16A.965, amounts not to exceed the increased revenues estimated by the commissioner of management and budget under section 297E.021, subdivision 2, are appropriated from the general fund to the commissioner of management and budget to make transfers to the Minnesota Sports Facilities Authority for stadium costs as defined under section 473J.03, subdivision 8.

(b) The commissioner shall make transfers to the Minnesota Sports Facilities Authority required to make the state payments under section 473J.13, subdivisions 2 and 4, and for the amount of Minneapolis taxes withheld under section 297A.994, subdivision 4, paragraph (a), clause (5). Amounts sufficient to make the transfers are appropriated to the commissioner from the general fund.

(c) $2,700,000 is annually appropriated from the general fund from fiscal year 2014 through fiscal year 2033 to the commissioner of management and budget for a grant to the city of St. Paul for the operating or capital costs of new or existing sports facilities.

Sec. 6. Minnesota Statutes 2010, section 297A.71, is amended by adding a subdivision to read:

Subd. 43. **Building materials; football stadium.** Materials and supplies used or consumed in, and equipment incorporated into, the construction or improvement of the football stadium and stadium infrastructure as defined in section 473J.03, subdivisions 8 and 10, are exempt. This subdivision expires one year after the date that the first National Football League game is played in the stadium for materials, supplies, and equipment used in the construction and equipping of the stadium, and five years after the issuance of the first bonds under section 16A.965 for materials, supplies, and equipment used in the public infrastructure.

EFFECTIVE DATE. This section is effective the day following final enactment.

Sec. 7. Minnesota Statutes 2011 Supplement, section 340A.404, subdivision 1, is amended to read:

Subdivision 1. **Cities.** (a) A city may issue an on-sale intoxicating liquor license to the following establishments located within its jurisdiction:

(1) hotels;

(2) restaurants;

(3) bowling centers;

(4) clubs or congressionally chartered veterans organizations with the approval of the commissioner, provided that the organization has been in existence for at least three years and liquor sales will only be to members and bona fide guests, except that a club may permit the general public to participate in a wine tasting conducted at the club under section 340A.419;

(5) sports facilities, restaurants, clubs, or bars located on land owned or leased by the Minnesota Sports Facilities Authority;

~~(5)~~ (6) sports facilities located on land owned by the Metropolitan Sports Commission; and

~~(6)~~ (7) exclusive liquor stores.

(b) A city may issue an on-sale intoxicating liquor license, an on-sale wine license, or an on-sale malt liquor license to a theater within the city, notwithstanding any law, local ordinance, or charter provision. A license issued under this paragraph authorizes sales on all days of the week to persons attending events at the theater.

(c) A city may issue an on-sale intoxicating liquor license, an on-sale wine license, or an on-sale malt liquor license to a convention center within the city, notwithstanding any law, local ordinance, or charter provision. A license issued under this paragraph authorizes sales on all days of the week to persons attending events at the convention center. This paragraph does not apply to convention centers located in the seven-county metropolitan area.

(d) A city may issue an on-sale wine license and an on-sale malt liquor license to a person who is the owner of a summer collegiate league baseball team, or to a person holding a concessions or management contract with the owner, for beverage sales at a ballpark or stadium located within the city for the purposes of summer collegiate league

baseball games at the ballpark or stadium, notwithstanding any law, local ordinance, or charter provision. A license issued under this paragraph authorizes sales on all days of the week to persons attending baseball games at the ballpark or stadium.

Sec. 8. Minnesota Statutes 2010, section 352.01, subdivision 2a, is amended to read:

Subd. 2a. **Included employees.** (a) "State employee" includes:

(1) employees of the Minnesota Historical Society;

(2) employees of the State Horticultural Society;

(3) employees of the Minnesota Crop Improvement Association;

(4) employees of the adjutant general whose salaries are paid from federal funds and who are not covered by any federal civilian employees retirement system;

(5) employees of the Minnesota State Colleges and Universities who are employed under the university or college activities program;

(6) currently contributing employees covered by the system who are temporarily employed by the legislature during a legislative session or any currently contributing employee employed for any special service as defined in subdivision 2b, clause (8);

(7) employees of the legislature who are appointed without a limit on the duration of their employment and persons employed or designated by the legislature or by a legislative committee or commission or other competent authority to conduct a special inquiry, investigation, examination, or installation;

(8) trainees who are employed on a full-time established training program performing the duties of the classified position for which they will be eligible to receive immediate appointment at the completion of the training period;

(9) employees of the Minnesota Safety Council;

(10) any employees who are on authorized leave of absence from the Transit Operating Division of the former Metropolitan Transit Commission and who are employed by the labor organization which is the exclusive bargaining agent representing employees of the Transit Operating Division;

(11) employees of the Metropolitan Council, Metropolitan Parks and Open Space Commission, Metropolitan Sports Facilities Commission, or Metropolitan Mosquito Control Commission unless excluded under subdivision 2b or are covered by another public pension fund or plan under section 473.415, subdivision 3;

(12) judges of the Tax Court;

(13) personnel who were employed on June 30, 1992, by the University of Minnesota in the management, operation, or maintenance of its heating plant facilities, whose employment transfers to an employer assuming operation of the heating plant facilities, so long as the person is employed at the University of Minnesota heating plant by that employer or by its successor organization;

(14) personnel who are employed as seasonal employees in the classified or unclassified service;

(15) persons who are employed by the Department of Commerce as a peace officer in the Insurance Fraud Prevention Division under section 45.0135 who have attained the mandatory retirement age specified in section 43A.34, subdivision 4;

(16) employees of the University of Minnesota unless excluded under subdivision 2b, clause (3);

(17) employees of the Middle Management Association whose employment began after July 1, 2007, and to whom section 352.029 does not apply; ~~and~~

(18) employees of the Minnesota Government Engineers Council to whom section 352.029 does not apply~~.~~; and

(19) employees of the Minnesota Sports Facilities Authority.

(b) Employees specified in paragraph (a), clause (13), are included employees under paragraph (a) if employer and employee contributions are made in a timely manner in the amounts required by section 352.04. Employee contributions must be deducted from salary. Employer contributions are the sole obligation of the employer assuming operation of the University of Minnesota heating plant facilities or any successor organizations to that employer.

Sec. 9. **[473J.01] PURPOSE.**

The purpose of this chapter is to provide for the construction, financing, and long-term use of a stadium and related stadium infrastructure as a venue for professional football and a broad range of other civic, community, athletic, educational, cultural, and commercial activities. The legislature finds and declares that the expenditure of public money for this purpose is necessary and serves a public purpose, and that property acquired by the Minnesota Sports Facilities Authority for the construction of the stadium and related stadium infrastructure is acquired for a public use or public purpose under chapter 117. The legislature further finds and declares that any provision in a lease or use agreement with a professional football team that requires the team to play all of its home games in a publicly funded stadium for the duration of the lease or use agreement, serves a unique public purpose for which the remedies of specific performance and injunctive relief are essential to its enforcement. The legislature further finds and declares that government assistance to facilitate the presence of professional football provides to the state of Minnesota and its citizens highly valued intangible benefits that are virtually impossible to quantify and, therefore, not recoverable even if the government receives monetary damages in the event of a team's breach of contract. Minnesota courts are, therefore, charged with protecting those benefits through the use of specific performance and injunctive relief as provided in this chapter and in the lease and use agreements.

Sec. 10. **[473J.03] DEFINITIONS.**

Subdivision 1. **Application.** For the purposes of this chapter, the terms defined in this section have the meanings given them, except as otherwise expressly provided or indicated by the context.

Subd. 2. **Annual adjustment factor.** "Annual adjustment factor" means for any year, the increase, if any, in the amounts of the city of Minneapolis taxes, imposed under a special law originally enacted in 1986, that are received by the commissioner of revenue in the preceding year over the amount received in the year prior to the preceding year, expressed as a percentage of the amount received in the year prior to the preceding year;

provided that the adjustment factor for any year must not be less than zero percent nor more than five percent.

Subd. 3. **Authority.** "Authority" means the Minnesota Sports Facilities Authority established under section 473J.07.

Subd. 4. **City.** "City" means the city of Minneapolis.

Subd. 5. **Net actual taxes.** "Net actual taxes" means the amount of revenues collected from the taxes in that year minus any refunds and costs of collection.

Subd. 6. **NFL.** The "NFL" means the National Football League.

Subd. 7. **NFL team.** "NFL team" means the owner and operator of the NFL professional football team known, as of the effective date of this chapter, as the Minnesota Vikings or any team owned and operated by someone who purchases or otherwise takes ownership or control of or reconstitutes the NFL team known as the Minnesota Vikings.

Subd. 8. **Stadium.** "Stadium" means the stadium suitable for professional football to be designed, constructed, and financed under this chapter. A stadium must have a roof that covers the stadium, as set forth in section 473J.11, subdivision 3.

Subd. 9. **Stadium costs.** "Stadium costs" means the costs of acquiring land, the costs of stadium infrastructure, and of designing, constructing, equipping, and financing a stadium suitable for professional football.

Subd. 10. **Stadium infrastructure.** "Stadium infrastructure" means plazas, parking structures, rights of way, connectors, skyways and tunnels, and other such property, facilities, and improvements, owned by the authority or determined by the authority to facilitate the use and development of the stadium.

Subd. 11. **Stadium plaza.** "Stadium plaza" means the open air portion of the stadium adjacent to the stadium.

Subd. 12. **Stadium site.** "Stadium site" means all or portions of the current site of the existing football stadium and adjacent areas, bounded generally by Park and Eleventh Avenues and Third and Sixth Streets in the city of Minneapolis, the definitive boundaries of which shall be determined by the authority and agreed to by the NFL team.

Sec. 11. **[473J.07] MINNESOTA SPORTS FACILITIES AUTHORITY.**

Subdivision 1. **Established.** The Minnesota Sports Facilities Authority is established as a public body, corporate and politic, and political subdivision of the state. The authority is not a joint powers entity or an agency or instrumentality of the city.

Subd. 2. **Membership.** (a) The authority shall consist of five members.

(b) The chair and two members shall be appointed by the governor. One member appointed by the governor shall serve until December 31 of the third year following appointment and one member shall serve until December 31 of the fourth year following appointment. Thereafter, members appointed by the governor shall serve four-year terms, beginning January 1. Each member serves until a successor is appointed and takes office. The chair serves at the pleasure of the governor.

(c) The mayor of the city shall appoint two members to the authority. One member appointed by the mayor of the city shall serve until December 31 of the third year following appointment and one member shall serve until December 31 of the fourth year

following appointment. Thereafter, members appointed under this paragraph shall serve four-year terms beginning January 1. Each member serves until a successor is appointed and takes office. Members appointed under this paragraph may reside within the city and may be appointed officials of a political subdivision.

(d) The initial members of the authority must be appointed not later than 30 days after the date of enactment of this chapter.

Subd. 3. **Compensation.** The authority may compensate its members, other than the chair, as provided in section 15.0575. The chair shall receive, unless otherwise provided by other law, a salary in an amount fixed by the authority, and shall be reimbursed for reasonable expenses to the same extent as a member.

Subd. 4. **Chair.** The chair presides at all meetings of the authority, if present, and performs all other assigned duties and functions. The authority may appoint from among its members a vice-chair to act for the chair during the temporary absence or disability of the chair, and any other officers the authority determines are necessary or convenient.

Subd. 5. **Removal.** A member, other than the chair, may be removed by the appointing authority only for misfeasance, malfeasance, or nonfeasance in office, upon written charges, and after an opportunity to be heard in defense of the charges.

Subd. 6. **Bylaws.** The authority shall adopt bylaws to establish rules of procedure, the powers and duties of its officers, and other matters relating to the governance of the authority and the exercise of its powers. Except as provided in this section, the bylaws adopted under this subdivision must be similar in form and substance to bylaws adopted by the Minnesota Ballpark Authority pursuant to section 473.755.

Subd. 7. **Audit.** The legislative auditor shall audit the books and accounts of the authority once each year or as often as the legislative auditor's funds and personnel permit. The authority shall pay the total cost of the audit pursuant to section 3.9741.

Subd. 8. **Executive director; employees.** The authority may appoint an executive director to serve as the chief executive officer of the authority. The executive director serves at the pleasure of the authority and receives compensation as determined by the authority. The executive director may be responsible for the operation, management, and promotion of activities of the authority, as prescribed by the authority. The executive director has the powers necessarily incident to the performance of duties required and powers granted by the authority, but does not have authority to incur liability or make expenditures on behalf of the authority without general or specific directions by the authority, as shown by the bylaws or minutes of a meeting of the authority. The executive director is responsible for hiring, supervision, and dismissal of all other employees of the authority.

Subd. 9. **Web site.** The authority shall establish a Web site for purposes of providing information to the public concerning all actions taken by the authority. At a minimum, the Web site must contain a current version of the authority's bylaws, notices of upcoming meetings, minutes of the authority's meetings, and contact telephone, electronic mail, and facsimile numbers for public comments.

Subd. 10. **Quorum; approvals.** Any three members shall constitute a quorum for the conduct of business and action may be taken upon the vote of a majority of members present at a meeting duly called and held. During the design and construction stages of the stadium, a four-fifths vote of the authority is required for authority decisions related to

zoning, land use, exterior design of the stadium, related parking, the plaza area, and the selection of the authority's lead representative during design and construction.

Sec. 12. **[473J.08] SPORTS FACILITIES OF THE AUTHORITY.**

Subdivision 1. **General.** This section describes the sports facilities that the Minnesota Sports Facilities Authority controls, operates, and has responsibility over pursuant to this chapter and as directed by law.

Subd. 2. **Sports facilities.** (a) The following sports facilities are part of the Minnesota Sports Facilities Authority:

(1) the professional football stadium constructed under this chapter; and

(2) any other sports facility constructed or acquired by the authority.

(b) The Target Center in Minneapolis, Xcel Energy Center in St. Paul, and Target Field in Minneapolis may join the facilities of the authority upon satisfaction of the following factors and upon the approval of the authority:

(1) the governing body of the facility must make the request to the authority to become a sports facility under this section;

(2) the governing body and the authority must negotiate an agreement with respect to the transfer of all obligations and responsibilities, including, but not limited to, outstanding debt, revenue sources, finance, funding, operations, equipment, repair and replacements, capital improvements, reserves, contracts, and agreements;

(3) the governing body and the professional sports team who is the primary user of the facility must make a joint recommendation to the authority;

(4) the authority must find that the inclusion of a facility under the authority will not have a negative impact on the authority, the general fund, or become an obligation of the state of Minnesota; and

(5) any other information or requirements requested by the authority.

Sec. 13. **[473J.09] POWERS, DUTIES OF THE AUTHORITY.**

Subdivision 1. **Actions.** The authority may sue and be sued. The authority is a public body and the stadium and stadium infrastructure are public improvements within the meaning of chapter 562. The authority is a municipality within the meaning of chapter 466.

Subd. 2. **Acquisition of property.** The authority may acquire from any public or private entity by lease, purchase, gift, or devise all necessary right, title, and interest in and to real property, air rights, and personal property deemed necessary to the purposes contemplated by this chapter. The authority may acquire, by the exercise of condemnation powers under chapter 117, land, other real property, air rights, personal property, and other right, title, and interest in property, within the stadium site and stadium infrastructure.

Subd. 3. **Disposition of property.** The authority may sell, lease, or otherwise dispose of any real or personal property acquired by the authority that is no longer required for accomplishment of the authority's purposes. The property may be sold in accordance with the procedures provided by section 469.065, except subdivisions 6 and 7, to the extent the authority deems it to be practical and consistent with this chapter. Title to the stadium must not be transferred or sold by the authority prior to the effective date of enactment of any legislation approving such transfer or sale.

Subd. 4. **Data practices; open meetings.** Except as otherwise provided in this chapter, the authority is subject to chapters 13 and 13D.

Subd. 5. **Facility operation.** The authority may develop, construct, equip, improve, own, operate, manage, maintain, finance, and control the stadium, stadium infrastructure, and related facilities constructed or acquired under this chapter, or may delegate such duties through an agreement, subject to the rights and obligations transferred to and assumed by the authority, the NFL team, other user, third-party manager, or program manager, under the terms of a lease, use agreement, or development agreement.

Subd. 6. **Employees; contracts for services.** The authority may employ persons and contract for services necessary to carry out its functions, including the utilization of employees and consultants retained by other governmental entities. The authority shall enter into an agreement with the city regarding traffic control for the stadium.

Subd. 7. **Gifts, grants, loans.** The authority may accept monetary contributions, property, services, and grants or loans of money or other property from the United States, the state, any subdivision of the state, any agency of those entities, or any person for any of its purposes, and may enter into any agreement required in connection with the gifts, grants, or loans. The authority shall hold, use, and dispose of the money, property, or services according to the terms of the monetary contributions, grant, loan, or agreement.

Subd. 8. **Use agreements.** The authority may lease, license, or enter into use agreements and may fix, alter, charge, and collect rents, fees, and charges for the use, occupation, and availability of part or all of any premises, property, or facilities under its ownership, operation, or control for purposes that will provide athletic, educational, cultural, commercial, or other entertainment, instruction, or activity for the citizens of Minnesota and visitors. The use agreements may provide that the other contracting party has exclusive use of the premises at the times agreed upon, as well as the right to retain some or all revenues from ticket sales, suite licenses, concessions, advertising, naming rights, NFL team designated broadcast/media, club seats, signage, and other revenues derived from the stadium. The lease or use agreement with an NFL team must provide for the payment by the NFL team of an agreed-upon portion of operating and maintenance costs and expenses and provide other terms in which the authority and NFL team agree. In no case may a lease or use agreement permit smoking in the stadium.

Subd. 9. **Research.** The authority may conduct research studies and programs; collect and analyze data; prepare reports, maps, charts, and tables; and conduct all necessary hearings and investigations in connection with its functions.

Subd. 10. **Insurance.** The authority may require any employee to obtain and file with the authority an individual bond or fidelity insurance policy. The authority may procure insurance in the amounts the authority considers necessary against liability of the authority or its officers and employees for personal injury or death and property damage or destruction, consistent with chapter 466, and against risks of damage to or destruction of any of its facilities, equipment, or other property.

Subd. 11. **Exemption from Metropolitan Council review; Business Subsidy Act.** The acquisition and betterment of a stadium and stadium infrastructure by the authority must be conducted pursuant to this chapter and are not subject to sections 473.165 and 473.173. Section 116J.994 does not apply to any transactions of the authority or other governmental entity related to the stadium or stadium infrastructure or to any tenant or other users of the stadium or stadium infrastructure.

Subd. 12. **Incidental powers.** In addition to the powers expressly granted in this chapter, the authority has all powers necessary or incidental thereto.

Subd. 13. **Legislative report.** The authority must report to the chairs and ranking minority members of the legislative committees with jurisdiction over state government finance by January 15 of each year on the following:

(a) any recommended increases in the rate or dollar amount of tax;

(b) any recommended increases in the debt of the authority;

(c) the overall work and role of the authority;

(d) the authority's proposed operating and capital budgets; and

(e) the authority's implementation of the operating and capital budgets.

Subd. 14. **Study; raffle.** The authority shall study the feasibility of conducting a raffle for chances to win a pair or other limited numbers of prime seats (such as lower deck, 50 yard line seats) in the stadium for professional football games for the duration of the lease or use agreement. In conducting the study, the authority must consult with the NFL team. If the authority determines that conducting the raffle is financially feasible, the authority in cooperation with the director of the Gambling Control Board shall conduct the raffle. The proceeds of the raffle must be transmitted to the commissioner of revenue for deposit in the general fund and are appropriated to the commissioner of management and budget for prepayment of principal and interest on appropriation bonds under section 16A.965.

Sec. 14. **[473J.10] LOCATION.**

The stadium to be constructed under this chapter shall be located at the stadium site in the city of Minneapolis.

Sec. 15. **[473J.11] STADIUM DESIGN AND CONSTRUCTION.**

Subdivision 1. **Contracts.** (a) The design, development, and construction of the stadium shall be a collaborative process between the authority and the NFL team. The authority and the NFL team shall establish a process to reach consensus on key elements of the stadium program and design, development, and construction.

(b) Unless the authority and the NFL team agree otherwise:

(1) the authority shall create a stadium design and construction group, including representatives of the authority and the NFL team, to manage the design of the stadium and oversee construction;

(2) this group shall engage an owner's representative to act on behalf of the group. The cost of the owner's representative shall be a stadium cost; and

(3) the authority and the NFL team shall enter into a development administration agreement providing for rights and responsibilities of the authority and the NFL team, the design and construction group, and the owner's representative for design and construction of the stadium, including, but not limited to, establishment of minimum design standards. This development administration agreement shall provide for binding arbitration in the event that the authority and the NFL team are unable to agree on minimum design standards or other material aspects of the design.

(c) The authority may enter into an agreement with the NFL team and any other entity relating to the design, construction, financing, operation, maintenance, and use of the stadium and related facilities and stadium infrastructure. The authority may contract for materials, supplies, and equipment in accordance with section 471.345, except that the authority may employ or contract with persons, firms, or corporations to perform one or more or all of the functions of architect, engineer, construction manager, or program manager with respect to all or any part of the design, construction, financing, operation, maintenance, and use of the stadium and stadium infrastructure under the traditional separate design and build, integrated design-build, construction manager at risk, or public/private partnership (P3) structures, or a combination thereof.

To the extent practicable, the agreement must provide that at least 25 percent of the materials, supplies, and equipment used in the construction, operation, maintenance, and use of the stadium and related facilities and stadium infrastructure, other than the material subject to section 473J.15, subdivision 11, paragraph (c), must be made or produced by Minnesota businesses.

(d) The authority and the NFL team shall prepare a request for proposals for one or more of the functions described in paragraph (c). The request must be published in the State Register and shall include, at a minimum, such requirements that are agreed to by the authority and the NFL team. The authority and the NFL team may prequalify offerors by issuing a request for qualifications, in advance of the request for proposals, and select a short list of responsible offerors prior to discussions and evaluations.

(e) As provided in the request for proposals, the authority, and the NFL team, may conduct discussions and negotiations with responsible offerors in order to determine which proposal is most advantageous to the authority and the NFL team and to negotiate the terms of an agreement. In conducting discussions, there shall be no disclosure of any information derived from proposals submitted by competing offerors and the content of all proposals is nonpublic data under chapter 13 until such time as a notice to award a contract is given by the authority. The agreement shall be subject to the approval of the NFL team.

(f) Prior to the time the authority enters into a construction contract with a construction manager or program manager certifying a maximum price and a completion date as provided in paragraph (h), at the request of the NFL team, the authority may authorize, such authorization not to be unreasonably withheld or delayed, the NFL team to provide for management of the construction of the stadium and related stadium infrastructure, in which event the NFL team must assume the role and responsibilities of the authority for completion of construction in a manner consistent with the agreed minimum design standards and design documents, subject to the terms of this act, including responsibility for cost overruns.

(g) For each contract for supplies, materials, labor, equipment, or services for the construction of the stadium or infrastructure, the construction manager or program manager shall require: (1) that the contract specify a guaranteed maximum price; and (2) if the amount charged under the contract is less than the guaranteed maximum price, the authority shall pay as follows: (i) half of the difference to the contract holder; and (ii) half of the difference to the state for transfer to the authority for capital reserves.

(h) The construction manager or program manager may enter into contracts with contractors for labor, materials, supplies, and equipment for the construction of the stadium and related stadium infrastructure through the process of public bidding, except

that the construction manager or program manager may, with the consent of the authority or the NFL team if the NFL team has assumed responsibility for construction:

(1) narrow the listing of eligible bidders to those which the construction manager or program manager determines to possess sufficient expertise to perform the intended functions;

(2) award contracts to the contractors that the construction manager or program manager determines provide the best value under a request for proposals as described in section 16C.28, subdivision 1, paragraphs (a), clause (2), and (c), which are not required to be the lowest responsible bidder; and

(3) for work the construction manager or program manager determines to be critical to the completion schedule, award contracts on the basis of competitive proposals, or perform work with its own forces without soliciting competitive bids if the construction manager or program manager provides evidence of competitive pricing.

(i) The authority and the NFL team shall require that the construction manager or program manager certify, before the contract is signed, a guaranteed maximum construction price and completion date to the authority and post a performance bond in an amount at least equal to 100 percent of the certified price or such other security satisfactory to the authority, to cover any costs which may be incurred in excess of the certified price including, but not limited to, costs incurred by the authority or loss of revenues resulting from incomplete construction on the completion date. The authority may secure surety bonds as provided in section 574.26, securing payment of just claims in connection with all public work undertaken by the authority. Persons entitled to the protection of the bonds may enforce them as provided in sections 574.28 to 574.32 and are not entitled to a lien on any property of the authority under the provisions of sections 514.01 to 514.16. The construction of the stadium is a project as that term is defined in section 177.42, subdivision 2, and is subject to the prevailing wage law under sections 177.41 to 177.43. The authority's contract with the construction manager or program manager shall provide that if the construction manager's or program manager's fees charged under the contract are less than the guaranteed maximum price, the authority shall pay: (1) half of the difference to the contract holder; and (2) half of the difference to the state for transfer to the authority for capital reserves. Costs or fees above the agreed guaranteed maximum price shall be the responsibility of the construction manager or program manager.

Subd. 2. **Changes.** Unless otherwise agreed to by the authority and the NFL team, if either party requests an agreed upon change in minimum design standards, and this change is responsible for requiring the project to exceed the stated budget, the requesting party is liable for any cost overruns or associated liabilities.

Subd. 3. **Stadium design.** The stadium and stadium infrastructure shall be designed and constructed incorporating the following general program and design elements:

(1) unless otherwise agreed to by the authority and the NFL team, the stadium shall comprise approximately 1,500,000 square feet with approximately 65,000 seats, expandable to 72,000, shall meet or exceed NFL program requirements, and include approximately 150 suites and approximately 7,500 club seats or other such components as agreed to by the authority and the NFL team;

(2) space for NFL team-related exhibitions and sales, which shall include the following: NFL team museum and Hall of Fame, retail merchandise and gift shop retail venues, and themed concessions and restaurants;

(3) year-round space for the NFL team administrative operations, sales, and marketing, including a ticket office, team meeting space, locker, and training rooms;

(4) space for administrative offices of the authority;

(5) 2,000 parking spaces within one block of the stadium, connected by skyway or tunnel to the stadium, and 500 parking spaces within two blocks of the stadium, with a dedicated walkway on game days;

(6) elements sufficient to provide community and civic uses as determined by the authority; and

(7) a roof that is fixed or retractable, provided that if the roof is retractable, it is accomplished without any increase to the funding provided by the state or the city.

Subd. 4. **Cost overruns, savings.** (a) Within the limits of paragraph (b), the authority may accept financial obligations relating to cost overruns associated with acquisition of the stadium site, stadium infrastructure, and stadium design, development, and construction, provided that the authority shall bid project construction in a manner that any cost overruns are the responsibility of the successful bidder and not the authority or the state. The authority shall not accept responsibility for cost overruns and shall not be responsible for cost overruns if the authority has authorized the NFL team to provide for management of construction of the stadium under subdivision 1. Cost savings or additional funds obtained by the authority or the NFL team for the stadium or stadium infrastructure may be used first to fund additional stadium or stadium infrastructure, as agreed to by the authority and the NFL team, if any, and then to fund capital reserves.

(b) The state share of stadium costs shall be limited to $348,000,000 for construction of a new stadium, as permitted under section 16A.726. The city of Minneapolis share shall be limited to no more than a $150,000,000 contribution for construction, and the annual operating cost and capital contributions contained under section 473J.13.

Sec. 16. **[473J.112] COMMEMORATIVE BRICKS.**

The authority shall sell commemorative bricks to be displayed at a prominent location in the new stadium, for an amount to be determined by the authority. Funds raised through this section shall be appropriated to the commissioner of management and budget for transfer to the Minnesota Sports Facilities Authority.

EFFECTIVE DATE. This section is effective the day following final enactment.

Sec. 17. **[473J.12] EMPLOYMENT.**

Subdivision 1. **Hiring and recruitment.** In the design, development, construction, management, operation, maintenance and capital repair, replacement and improvement of the stadium and stadium infrastructure, the authority shall make every effort to employ, and cause the NFL team, the construction manager and other subcontractors, vendors, and concessionaires to employ women and members of minority communities when hiring. In addition, the authority shall contract with an employment assistance firm, preferably minority-owned, or owned by a disabled individual or a woman, to create an employment program to recruit, hire, and retain minorities for the stadium facility. The authority shall hold a job fair and recruit and advertise at Minneapolis Urban League, Sabathani, American Indian OIC, Youthbuild organizations, and other such organizations. Further, goals for construction contracts to be awarded to women- and minority-owned businesses

will be in a percentage at least equal to the minimum used for city of Minneapolis development projects, and the other construction workforce will establish workforce utilization goals at least equal to current city goals and include workers from city zip codes that have high rates of poverty and unemployment.

Subd. 2. **Other required agreements.** The NFL team or the authority shall give food, beverage, retail, and concession workers presently employed by the NFL team or the Metropolitan Sports Facilities Commission or its vendors at the existing football stadium the opportunity to continue their employment in comparable positions at the new stadium. Workers who are presently represented under a collective bargaining agreement may seek to continue such representation in the facility and designate such, or another collective bargaining unit, as their representative.

Sec. 18. **[473J.13] STADIUM OPERATIONS; CAPITAL IMPROVEMENTS.**

Subdivision 1. **Stadium operation.** The stadium shall be operated in a first-class manner, similar to and consistent with other comparable NFL stadiums. The authority and the team will mutually agree on a third-party management company or individual to manage the stadium and on certain major vendors to the stadium. The authority, with the approval of the NFL team, may enter into an agreement with a program manager for management of the stadium, for a maximum of 30 years.

Subd. 2. **Operating expenses.** (a) The authority must pay or cause to be paid all operating expenses of the stadium. The authority must require in the lease or use agreement with the NFL team that the NFL team pay the authority, beginning January 1, 2016, or other date as mutually agreed upon by the parties, toward operating costs of the stadium, $8,500,000 each year, increased by a three percent annual inflation rate.

(b) Beginning January 1, 2016, or other date as mutually agreed upon by the parties, and continuing through 2020, the state shall pay the authority operating expenses, $6,000,000 each year, increased by an annual adjustment factor. The payment of $6,000,000 per year beginning in 2016 is a payment by the state, which shall be repaid to the state, using funds as provided under section 297A.994, subdivision 4, clause (4). After 2020, the state shall assume this payment, using funds generated in accordance with the city of Minneapolis as specified under section 297A.994, subdivision 4, clause (3).

(c) The authority may establish an operating reserve to cover operating expense shortfalls and may accept funds from any source for deposit in the operating reserve. The establishment or funding of an authority operating reserve must not decrease the amounts required to be paid to the authority toward operating costs under this subdivision unless agreed to by the authority.

(d) The authority will be responsible for operating cost overruns.

(e) After the joint selection of the third-party manager or program manager, the authority may agree with a program manager or other third-party manager of the stadium on a fixed cost operating, management, or employment agreement with operating cost protections under which the program manager or third-party manager assumes responsibility for stadium operating costs and shortfalls. The agreement with the manager must require the manager to prepare an initial and ongoing operating plan and operating budgets for approval by the authority in consultation with the NFL team. The manager must agree to operate the stadium in accordance with the approved operating plan and operating budget.

Subd. 3. **Public access.** The authority will work to maximize access for public and amateur sports, community, and civic events, and other public events in type and on terms consistent with those currently held at the existing football stadium, as defined in section 473.551, subdivision 9. The authority may provide that these events have exclusive use of the premises at agreed-upon times subject to the scheduling rights of the NFL team under the lease or use agreement.

Subd. 4. **Capital improvements.** (a) The authority shall establish a capital reserve fund. The authority shall be responsible for making, or for causing others to make, all capital repairs, replacements, and improvements for the stadium and stadium infrastructure. The authority shall maintain, or cause others to maintain, the stadium and stadium infrastructure in a safe, clean, attractive, and first-class manner so as to cause them to remain in a condition comparable to that of other comparable NFL facilities of similar design and age. The authority shall make, or cause others to make, all necessary or appropriate repairs, renewals, and replacements, whether structural or nonstructural, interior or exterior, ordinary or extraordinary, foreseen or unforeseen, in a prompt and timely manner. In addition, the authority, with approval of the NFL team, may enter into an agreement with a program manager to perform some or all of the responsibilities of the authority in this subdivision and to assume and accept financial liability for the cost of performing the responsibilities.

(b) The NFL team must contribute $1,500,000 each year, beginning in 2016 or as otherwise determined for the term of the lease or use agreement to the capital reserve fund, increased by a three percent annual inflation rate.

(c) The state shall contribute $1,500,000 each year, beginning in 2016 or as otherwise determined for the term of the lease to the capital reserve fund. The contributions of the state are subject to increase by an annual adjustment factor. The contribution under this paragraph by the state from 2016 through 2020 shall be repaid to the state using funds in accordance with section 297A.994, subdivision 4, clause (4).

(d) The authority with input from the NFL team shall develop short-term and long-term capital funding plans and shall use those plans to guide the future capital needs of the stadium and stadium infrastructure. The authority shall make the final determination with respect to funding capital needs. Any capital improvement proposed by the NFL team intended primarily to provide revenue enhancements to the NFL team shall be paid for by the NFL team, unless otherwise agreed to with the authority.

(e) The NFL team has authority to determine the design of a retractable roof feature for the stadium. The NFL team must cooperate with the authority in designing the feature to minimize any additional operating cost. The design must not result in a material marginal increase in the operating or capital costs of the stadium, considering current collections and reserves.

Subd. 5. **Game-day payments.** In addition to operating expense contributions of the NFL team under subdivision 2, the NFL team shall pay all NFL game day, NFL team-owned major league soccer, as provided in section 473J.15, subdivision 15, and other NFL team-sponsored event expenses within the stadium and stadium plaza areas.

Subd. 6. **Cooperation with financing.** The authority shall cooperate with the NFL team to facilitate the financing of the NFL team's contribution. Such agreement to cooperate shall not require the authority to incur any additional costs or provide conduit

financing. The lease, license, and other transaction documents shall include provisions customarily required by lenders in stadium financings.

Sec. 19. **[473J.15] CRITERIA AND CONDITIONS.**

Subdivision 1. **Binding and enforceable.** In developing the stadium and entering into related contracts, the authority must follow and enforce the criteria and conditions in this section, provided that a determination by the authority that those criteria or conditions have been met under any agreement or otherwise shall be conclusive.

Subd. 2. **NFL team/private contribution; timing of expenditures.** (a) The NFL team/private contribution, including stadium builder license proceeds, for stadium costs must be made in cash in the amount of at least $477,000,000.

(b) Prior to the initial deposit of funds under this section, the team must provide security or other credit worthiness in the amount of $50,000,000, subject to the satisfaction of the authority. Prior to the first issuance of bonds under section 16A.965, the first portion of the NFL team/private contribution in the amount of $50,000,000 must be deposited as costs are incurred to the construction fund to pay for the initial stadium costs.

(c) After the first $50,000,000 of stadium costs have been paid from the initial NFL team/private contribution, state funds shall be deposited as costs are incurred to the construction fund to pay for the next $50,000,000 of costs of the project. Prior to any state funds being deposited in the construction fund, the NFL team must provide security or a financing commitment reasonably satisfactory to the authority for the balance of the required NFL team/private contribution and for payment of cost overruns if the NFL team assumes responsibility for stadium construction under section 473J.11. Thereafter, budgeted project costs shall be borne by the authority and the NFL team/private contributions in amounts proportionate to their remaining funding commitments.

(d) In the event the project terminates before the initial $100,000,000 in contributions are expended by the parties under this subdivision, the parties shall be reimbursed in the amounts they have deposited to the construction fund proportionate to project funding percentages, in the amounts of 51 percent by the authority and 49 percent by the NFL team/private contributions.

Subd. 3. **Lease or use agreements; 30-year term.** The authority must enter into a long-term lease or use agreement with the NFL team for the NFL team's use of the stadium. The NFL team must agree to play all preseason, regular season, and postseason home games at the stadium. However, the team may play up to three home games outside of the United States during the first 15 years of the lease or use agreement and up to three home games outside of the United States in the next 15 years of the lease or use agreement. Training facilities must remain in Minnesota during the term of the lease or use agreement. The lease or use agreement must be for a term of at least 30 years from the date of substantial completion of the stadium for professional football games. The lease or use agreement may provide options for the NFL team to extend the term for up to four additional periods of five years. The lease or use agreement must include terms for default, termination, and breach of the agreement. Recognizing that the presence of professional football provides to the state of Minnesota and its citizens highly valued, intangible benefits that are virtually impossible to quantify and, therefore, not recoverable in the event of the NFL team owner's breach of contract, the lease and use agreements must provide for specific performance and injunctive relief to enforce provisions relating to use of the stadium for professional football and must not include escape clauses

or buyout provisions. The NFL team must not enter into or accept any agreement or requirement with or from any entity that is inconsistent with the NFL team's binding commitment to the 30-year term of the lease or use agreement or that would in any manner dilute, interfere with, or negate the provisions of the lease or use agreement, providing for specific performance or injunctive relief. The legislature conclusively determines, as a matter of public policy, that the lease or use agreement, and any grant agreement under this chapter that includes a specific performance clause:

(1) explicitly authorizes specific performance as a remedy for breach;

(2) is made for adequate consideration and upon terms which are otherwise fair and reasonable;

(3) has not been included through sharp practice, misrepresentation, or mistake;

(4) if specifically enforced, does not cause unreasonable or disproportionate hardship or loss to the NFL team or to third parties; and

(5) involves performance in a manner and the rendering of services of a nature and under circumstances that the beneficiary cannot be adequately compensated in damages.

Subd. 4. **Lease or use agreements; revenues, payments.** A lease or use agreement shall include rent and other fees and expenses to be paid by the NFL team. The authority shall agree to provide in the lease or use agreement for the NFL team to receive all NFL and team event related revenues, including but not limited to, suite revenues, advertising, concessions, signage, broadcast and media, and club seat revenue. The agreement shall also provide that all naming rights to the stadium are retained by the NFL team, subject to the approval of the name or names by the authority consistent with those criteria set out in the lease or use agreement. The agreement shall provide for the authority to receive all general ticket revenues and other event revenues other than from NFL team games, NFL team-owned major league soccer games, and other NFL team events agreed to by the authority.

Subd. 5. **Notice of breach or default.** Until 30 years from the date of stadium completion, the NFL team must provide written notice to the authority not less than 180 days prior to any action, including any action imposed upon the NFL team by the NFL, which would result in a breach or default of provisions of the lease or use agreements required to be included under subdivision 3. If this notice provision is violated and the NFL team has already breached or been in default under the required provisions, the authority or the state of Minnesota may specifically enforce the lease or use agreement and Minnesota courts shall fashion equitable remedies so that the NFL team fulfills the conditions of the lease and use agreements.

Subd. 6. **Enforceable financial commitments.** The authority must determine before stadium construction begins that all public and private funding sources for construction, operating expenses, and capital improvements and repairs of the stadium are included in written agreements. The committed funds must be adequate to design, construct, furnish, and equip the stadium, and pay projected operating expenses and the costs of capital improvements and repairs during the term of the lease or use agreement with the NFL team. The NFL team must provide the authority access to NFL team financial or other information, which the authority deems necessary for such determination. Any financial information obtained by the authority under this subdivision is nonpublic data under section 13.02, subdivision 9.

Subd. 7. **Environmental requirements.** The authority must comply with all environmental requirements imposed by regulatory agencies for the stadium, site, and structure, except as provided by section 473J.09, subdivision 11, or by section 473J.17.

Subd. 8. **Public share on sale of NFL team.** (a) The lease or use agreement must provide that if the NFL team is sold, or an interest in the NFL team is sold after the effective date of this section, a portion of the sale price, determined according to the schedule in paragraph (b), is the public share and must be paid to the state and the city, in amounts proportionate to the expenditures made by the state and from city taxes, respectively, for the purposes of this chapter. If any portion of the public share of the sale price remains after the state and city have been paid, that amount must be deposited in the general fund.

(b) The portion of the sale price required to be paid under paragraph (a) is:

(1) 25 percent of the amount in excess of the purchase price of the NFL team by the selling owner or owners for ten years, beginning on the effective date of this section;

(2) 15 percent during years 11 to 15 after the effective date of this section; and

(3) ten percent during years 16 to 20 after the effective date of this section.

Thereafter, no portion of the sale price is required to be paid under paragraph (a).

(c) The agreement must provide exceptions for sales to members of the owners' families and entities and trusts beneficially owned by family members, sales to employees of equity interests aggregating up to ten percent, sales related to capital infusions not distributed to the owners, and sales among existing owners not exceeding 20 percent equity interest in the NFL team.

Subd. 9. **Authority's access to NFL team financial information.** A notice provision for a material breach shall be agreed to between the authority and the NFL team. In the event there is a material breach by the NFL team under the lease or use agreement, the lease or use agreement must provide the authority access to audited financial statements of the NFL team and other financial information that the authority deems necessary to enforce the terms of any lease or use agreements. Any financial information obtained by the authority under this subdivision is nonpublic data under section 13.02, subdivision 9.

Subd. 10. **NFL team name retained.** The lease or use agreement must provide that the NFL shall retain the Minnesota Vikings' heritage and records, including the name, logo, colors, history, playing records, trophies, and memorabilia in the event of relocation of the NFL team in violation of the lease or use agreement, and shall not permit use of these rights except for a team located in the state of Minnesota.

Subd. 11. **Stadium design.** (a) To the extent practicable, the authority and the NFL team will build a stadium that is environmentally and energy efficient and will make an effort to build a stadium that is eligible to receive the Leadership in Energy and Environmental Design (LEED) certification or the Green Building Initiative Green Globes certification for environmental design, and to the extent practicable, will strive to make the stadium design architecturally significant.

(b) To the extent practicable, the stadium design must, to the extent that the costs of following the guidelines have a payback in energy savings in 30 years or less, follow sustainable building guidelines established under section 16B.325. The authority and NFL team must work with local utility companies to establish a base utility cost under the state energy codes and calculate energy cost savings resulting from complying with

the guidelines. The authority and NFL team must fully utilize conservation improvement assistance under section 216B.241 and other energy savings programs available to them.

(c) To the extent practicable, the authority and the team must ensure that the stadium be built with American-made steel that is made from Minnesota iron ore.

Subd. 12. **Necessary approvals.** The authority and the NFL team must secure any necessary approvals to the terms of the lease and use agreement and the design and construction plans for the stadium, including prior approval of the NFL.

Subd. 13. **Affordable access.** The lease or use agreement must provide for an agreed-upon number of affordable tickets to the professional sporting events held in the stadium.

Subd. 14. **Stadium builder's licenses.** The authority shall own and retain the exclusive right to sell stadium builder's licenses in the stadium. The authority will retain the NFL team to act as the authority's agent in marketing and selling such licenses.

Subd. 15. **Major league soccer.** The authority shall, for five years after the first NFL team home game is played in the stadium, grant the NFL team the exclusive right to establish major league soccer at the stadium. The authority and the NFL team may enter into an agreement providing the terms and conditions of such an arrangement, provided:

(1) if any of the NFL team owners whose family owns at least three percent of the NFL team purchases full or partial ownership in a major league soccer franchise, such franchise may play in the stadium under a use agreement with similar terms as are applicable to the NFL team which shall include rent based on market conditions but not less than a provision of payment of game-day costs and reasonable marginal costs incurred by the authority as a result of the major league soccer team; and

(2) capital improvements required by a major league soccer franchise must be financed by the owners of the major league soccer team, unless otherwise agreed to by the authority.

Subd. 16. **NFL team-related entities.** Subject to the prior approval of the authority, which shall not be unreasonably withheld, any of the obligations by the NFL team may be performed by the NFL team, a related entity, or a third party, and the NFL team, any entity related to the NFL team or third party may receive any revenues to which the NFL team is entitled hereunder; provided, however, the NFL team shall remain liable if any obligations are assigned to a related entity or third party.

Sec. 20. **[473J.17] MUNICIPAL ACTIVITIES.**

Subdivision 1. **Property acquisition and disposition.** The city may, to the extent legally permissible, acquire land, air rights, and other property interests within the development area for the stadium site and stadium infrastructure and convey it to the authority with or without consideration, prepare a site for development as a stadium, and acquire and construct any related stadium infrastructure. To the extent property parcels or interests acquired are more extensive than the stadium infrastructure requirements, the city may sell or otherwise dispose of the excess.

Subd. 2. **Claims.** Except as may be mutually agreed to by the city and the authority, the city has no interest in or claim to any assets or revenues of the authority.

Subd. 3. **Environmental; planning and zoning.** The authority is the responsible governmental unit for an environmental impact statement for the stadium prepared under

section 116D.04, if an environmental impact statement is necessary. Notwithstanding section 116D.04, subdivision 2b, and implementing rules: (1) the environmental impact statement shall not be required to consider alternative stadium sites; and (2) the environmental impact statement must be determined to be adequate before commencing work on the foundation of the stadium, but the stadium and stadium infrastructure may otherwise be started and all preliminary and final government decisions and actions may be made and taken including, but not limited to, acquiring land; obtaining financing; granting permits or other land use approvals; entering into grant, lease, or use agreements; or preparing the site or related stadium infrastructure prior to a determination of the adequacy of the environmental impact statement.

Subd. 4. **Local government expenditure.** The city may make expenditures or grants for other costs incidental and necessary to further the purposes of this chapter and may, by agreement, reimburse in whole or in part, any entity that has granted, loaned, or advanced funds to the city to further the purposes of this chapter. The city may reimburse the authority or a local governmental entity or make a grant to the authority or such a governmental unit or be reimbursed by the authority or local governmental entity for site acquisition, preparation of the site for stadium development, and stadium infrastructure.

Subd. 5. **Municipal authority.** The legislature intends that, except as expressly limited herein, the city may acquire and develop stadium infrastructure, enter into contracts with the authority and other governmental or nongovernmental entities, appropriate funds, and make employees, consultants, and other revenues available for those purposes.

Subd. 6. **Stadium Implementation Committee; city review.** In order to accomplish the objectives of this act within the required time frame, it is necessary to establish an alternative process for municipal land use and development review. It is hereby found and declared that the construction of a stadium within the development area is consistent with the adopted area plan, is the preferred stadium location, and is a permitted land use. This subdivision establishes a procedure for all land use and development reviews and approvals by the city of Minneapolis for the stadium and related stadium infrastructure and supersedes all land use and development rules and restrictions and procedures imposed by other law, charter, or ordinance, including without limitation section 15.99. No later than 30 days after timely compliance of the city as provided in article 3, section 7, of this act, the city of Minneapolis shall establish a stadium implementation committee to make recommendations on the design plans submitted for the stadium, and stadium infrastructure, and related improvements. The implementation committee must take action to issue its recommendations within the time frames established in the planning and construction timetable issued by the authority which shall provide for no less than 60 days for the committee's review. The recommendations of the implementation committee shall be forwarded to the city of Minneapolis Planning Commission for an advisory recommendation and then to the city council for final action in a single resolution, which final action must be taken within 45 days of the submission of the recommendations to the planning commission. The city council shall not impose any unreasonable conditions on the recommendations of the implementation committee, nor take any action or impose any conditions that will result in delay from the time frames established in the planning and construction timetable or in additional overall costs. Failure of the city council to act within the 45-day period shall be deemed to be approval. The authority may seek de novo review in the district court of any city council action. The district court or any appellate court shall expedite review to the maximum extent possible and timely issue relief, orders, or opinions as necessary to give effect to the provisions and objectives in this act.

Sec. 21. **[473J.19] PROPERTY TAX EXEMPTION; SPECIAL ASSESSMENTS.**

Any real or personal property acquired, owned, leased, controlled, used, or occupied by the authority for any of the purposes of this chapter, is acquired, owned, leased, controlled, used, and occupied for public, governmental, and municipal purposes. The stadium and stadium infrastructure are exempt from ad valorem taxation by the state or any political subdivision of the state provided that the properties are subject to special assessments levied by a political subdivision for a local improvement in amounts proportionate to and not exceeding the special benefit received by the properties from the improvement. No possible use of any of the properties in any manner different from their use under this chapter may be considered in determining the special benefit received by the properties. Notwithstanding section 272.01, subdivision 2, or 273.19, real or personal property which is subject to a lease or use agreement between the authority and another person for uses related to the purposes of this chapter, including the operation of the stadium and related parking facilities, is exempt from taxation regardless of the length of the lease or use agreement or the characteristics of the entity leasing or using the property. This section, insofar as it provides an exemption or special treatment, does not apply to any real property that is leased for residential, business, or commercial development or to a restaurant that is open for general business more than 200 days a year, or other purposes different from those contemplated in this chapter.

Sec. 22. **[473J.21] LIQUOR LICENSES.**

At the request of the authority, the city may issue intoxicating liquor licenses that are reasonably required for the premises of the stadium site. These licenses are in addition to the number authorized by law. All provisions of chapter 340A not inconsistent with this section apply to the licenses authorized under this section.

Sec. 23. **[473J.23] LOCAL TAXES.**

No new or additional local sales or use tax shall be imposed on sales at the stadium site unless the tax is applicable throughout the taxing jurisdiction. Except for a tax imposed under section 16A.727, no new or additional local tax shall be imposed on sales of tickets and admissions to NFL team, NFL team-owned major league soccer, or other team related events at the stadium, notwithstanding any law or ordinance, unless the tax is applicable throughout the taxing jurisdiction. The admissions and amusements tax currently imposed by the city of Minneapolis pursuant to Laws 1969, chapter 1092, may apply to admissions for football and NFL team related events, including NFL team-owned major league soccer, as provided in section 473J.15, subdivision 15, at the stadium.

Sec. 24. **[473J.25] METROPOLITAN SPORTS FACILITIES COMMISSION ASSETS; LIABILITIES TO AUTHORITY.**

Subdivision 1. **Authority expenses.** The Metropolitan Sports Facilities Commission shall pay the operating expenses of the authority including salaries, compensation, and other personnel, office, equipment, consultant and any other costs, until the commission is abolished pursuant to subdivision 3.

Subd. 2. **Transfer.** Within 90 days of the enactment of this chapter, the Metropolitan Sports Facilities Commission shall pay its outstanding obligations, settle its accounts, and transfer its remaining assets, liabilities, and obligations to the authority, for its purposes.

Subd. 3. **Metropolitan Sports Facilities Commission abolished; interim powers conferred on authority.** Upon transfer to the authority of all remaining assets, liabilities, and obligations of the Metropolitan Sports Facilities Commission, in subdivision 2, the Metropolitan Sports Facilities Commission is abolished. When the remaining assets, liabilities, and obligations of the Metropolitan Sports Facilities Commission have been transferred to the authority and the commission has been abolished, the powers and duties of the commission under sections 473.551 to 473.599, and any other law shall devolve upon the authority, in addition to the powers and duties of the authority under chapter 473J, until the first NFL home game is played at the stadium.

Subd. 4. **Employees.** Upon transfer of ownership all persons employed by the Metropolitan Sports Facilities Commission shall be transferred to the Minnesota Sports Facilities Authority without loss of right or privilege. Nothing in this section shall be construed to give any such person the right or privilege to continue in the same level or classification of employment previously held. The Minnesota Sports Facilities Authority may assign any such person to an employment level and classification which it deems appropriate and desirable in accordance with its personnel code.

Subd. 5. **Conforming changes.** The Metropolitan Sports Facilities Commission shall submit a technical bill to the 2013 legislature making any cross-reference, grammatical, or other conforming changes necessary as a result of this act. This bill shall be submitted by February 12, 2013.

Sec. 25. **EFFECTIVE DATE.**

Except as otherwise provided, this article is effective the day following final enactment.

ARTICLE 2

STATE STADIUM FUNDING

Section 1. **[16A.965] STADIUM APPROPRIATION BONDS.**

Subdivision 1. **Definitions.** (a) The definitions in this subdivision and in chapter 473J apply to this section.

(b) "Appropriation bond" means a bond, note, or other similar instrument of the state payable during a biennium from one or more of the following sources:

(1) money appropriated by law from the general fund in any biennium for debt service due with respect to obligations described in subdivision 2, paragraph (b);

(2) proceeds of the sale of obligations described in subdivision 2, paragraph (b);

(3) payments received for that purpose under agreements and ancillary arrangements described in subdivision 2, paragraph (d); and

(4) investment earnings on amounts in clauses (1) to (3).

(c) "Debt service" means the amount payable in any biennium of principal, premium, if any, and interest on appropriation bonds.

Subd. 2. **Authorization to issue appropriation bonds.** (a) Subject to the limitations of this subdivision, the commissioner may sell and issue appropriation bonds of the state under this section for public purposes as provided by law, including, in

particular, the financing of all or a portion of the acquisition, construction, improving, and equipping of the stadium project of the Minnesota Sports Facilities Authority as provided by chapter 473J. Proceeds of the appropriation bonds must be credited to a special appropriation stadium bond proceeds fund in the state treasury. Net income from investment of the proceeds, as estimated by the commissioner, must be credited to the special appropriation stadium bond proceeds fund.

(b) Appropriation bonds may be sold and issued in amounts that, in the opinion of the commissioner, are necessary to provide sufficient funds, not to exceed $498,000,000 net of costs of issuance, revenue generated under section 16A.6455, and allocated by the commissioner of management and budget for this purpose and costs of credit enhancement for achieving the purposes authorized as provided under paragraph (a), and pay debt service including capitalized interest, pay costs of issuance, make deposits to reserve funds, pay the costs of credit enhancement, or make payments under other agreements entered into under paragraph (d); provided, however, that appropriation bonds issued and unpaid shall not exceed $600,000,000 in principal amount, excluding refunding bonds sold and issued under subdivision 4.

(c) Appropriation bonds may be issued from time to time in one or more series on the terms and conditions the commissioner determines to be in the best interests of the state, but the term on any series of appropriation bonds may not exceed 30 years. The appropriation bonds of each issue and series thereof shall be dated and bear interest, and may be includable in or excludable from the gross income of the owners for federal income tax purposes.

(d) At the time of, or in anticipation of, issuing the appropriation bonds, and at any time thereafter, so long as the appropriation bonds are outstanding, the commissioner may enter into agreements and ancillary arrangements relating to the appropriation bonds, including but not limited to trust indentures, grant agreements, lease or use agreements, operating agreements, management agreements, liquidity facilities, remarketing or dealer agreements, letter of credit agreements, insurance policies, guaranty agreements, reimbursement agreements, indexing agreements, or interest exchange agreements. Any payments made or received according to the agreement or ancillary arrangement shall be made from or deposited as provided in the agreement or ancillary arrangement. The determination of the commissioner included in an interest exchange agreement that the agreement relates to an appropriation bond shall be conclusive.

(e) The commissioner may enter into written agreements or contracts relating to the continuing disclosure of information necessary to comply with, or facilitate the issuance of appropriation bonds in accordance with federal securities laws, rules, and regulations, including Securities and Exchange Commission rules and regulations in Code of Federal Regulations, title 17, section 240.15c 2-12. An agreement may be in the form of covenants with purchasers and holders of appropriation bonds set forth in the order or resolution authorizing the issuance of the appropriation bonds, or a separate document authorized by the order or resolution.

(f) The appropriation bonds are not subject to chapter 16C.

Subd. 3. **Form; procedure.** (a) Appropriation bonds may be issued in the form of bonds, notes, or other similar instruments, and in the manner provided in section 16A.672. In the event that any provision of section 16A.672 conflicts with this section, this section shall control.

(b) Every appropriation bond shall include a conspicuous statement of the limitation established in subdivision 6.

(c) Appropriation bonds may be sold at either public or private sale upon such terms as the commissioner shall determine are not inconsistent with this section and may be sold at any price or percentage of par value. Any bid received may be rejected.

(d) Appropriation bonds must bear interest at a fixed or variable rate.

(e) Notwithstanding any other law, appropriation bonds issued under this section shall be fully negotiable.

Subd. 4. **Refunding bonds.** The commissioner from time to time may issue appropriation bonds for the purpose of refunding any appropriation bonds then outstanding, including the payment of any redemption premiums on the bonds, any interest accrued or to accrue to the redemption date, and costs related to the issuance and sale of the refunding bonds. The proceeds of any refunding bonds may, in the discretion of the commissioner, be applied to the purchase or payment at maturity of the appropriation bonds to be refunded, to the redemption of the outstanding appropriation bonds on any redemption date, or to pay interest on the refunding bonds and may, pending application, be placed in escrow to be applied to the purchase, payment, retirement, or redemption. Any escrowed proceeds, pending such use, may be invested and reinvested in obligations that are authorized investments under section 11A.24. The income earned or realized on the investment may also be applied to the payment of the appropriation bonds to be refunded or interest or premiums on the refunded appropriation bonds, or to pay interest on the refunding bonds. After the terms of the escrow have been fully satisfied, any balance of the proceeds and any investment income may be returned to the general fund or, if applicable, the special appropriation stadium bond proceeds fund for use in any lawful manner. All refunding bonds issued under this subdivision must be prepared, executed, delivered, and secured by appropriations in the same manner as the appropriation bonds to be refunded.

Subd. 5. **Appropriation bonds as legal investments.** Any of the following entities may legally invest any sinking funds, money, or other funds belonging to them or under their control in any appropriation bonds issued under this section:

(1) the state, the investment board, public officers, municipal corporations, political subdivisions, and public bodies;

(2) banks and bankers, savings and loan associations, credit unions, trust companies, savings banks and institutions, investment companies, insurance companies, insurance associations, and other persons carrying on a banking or insurance business; and

(3) personal representatives, guardians, trustees, and other fiduciaries.

Subd. 6. **No full faith and credit; state not required to make appropriations.** The appropriation bonds are not public debt of the state, and the full faith, credit, and taxing powers of the state are not pledged to the payment of the appropriation bonds or to any payment that the state agrees to make under this section. Appropriation bonds shall not be obligations paid directly, in whole or in part, from a tax of statewide application on any class of property, income, transaction, or privilege. Appropriation bonds shall be payable in each fiscal year only from amounts that the legislature may appropriate for debt service for any fiscal year, provided that nothing in this section shall be construed to require the state to appropriate funds sufficient to make debt service payments with respect to the appropriation bonds in any fiscal year. Appropriation bonds shall be canceled and

shall no longer be outstanding on the earlier of (1) the first day of a fiscal year for which the legislature shall not have appropriated amounts sufficient for debt service, or (2) the date of final payment of the principal of and interest on the appropriation bonds.

Subd. 7. **Appropriation of proceeds.** The proceeds of appropriation bonds and interest credited to the special appropriation stadium bond proceeds fund are appropriated to the commissioner for payment of capital expenses including capitalized interest, debt service on outstanding indebtedness of the state, and for the operating and capital reserves of the authority, each as permitted by state and federal law, and nonsalary expenses incurred in conjunction with the sale of the appropriation bonds, and such proceeds may be granted, loaned, or otherwise provided to the authority for the public purpose provided by subdivision 2, paragraph (a).

Subd. 8. **Appropriation for debt service and other purposes.** The amount needed to pay principal and interest on appropriation bonds issued under this section is appropriated each fiscal year from the general fund to the commissioner, subject to repeal, unallotment under section 16A.152, or cancellation, otherwise pursuant to subdivision 6, for deposit into the bond payments account established for such purpose in the special appropriation stadium bond proceeds fund.

Subd. 9. **Waiver of immunity.** The waiver of immunity by the state provided for by section 3.751, subdivision 1, shall be applicable to the appropriation bonds and any ancillary contracts to which the commissioner is a party.

Subd. 10. **Validation.** (a) Appropriation bonds issued under this section may be validated in the manner provided by this subdivision. If comparable appropriation bonds are judicially determined to be valid, nothing in this subdivision shall be construed to prevent the sale or delivery of any appropriation bonds or notes without entry of a judgment of validation by the Minnesota Supreme Court pursuant to this subdivision with respect to the appropriation bonds authorized under this section.

(b) Any appropriation bonds issued under this section that are validated shall be validated in the manner provided by this subdivision.

(c) The Minnesota Supreme Court shall have original jurisdiction to determine the validation of appropriation bonds and all matters connected therewith.

(d) The commissioner may determine the commissioner's authority to issue appropriation bonds and the legality of all proceedings in connection with issuing bonds. For this purpose, a complaint shall be filed by the commissioner in the Minnesota Supreme Court against the state and the taxpayers and citizens.

(e) As a condition precedent to filing of a complaint for the validation of appropriation bonds, the commissioner shall take action providing for the issuance of appropriation bonds in accordance with law.

(f) The complaint shall set out the state's authority to issue appropriation bonds, the action or proceeding authorizing the issue and its adoption, all other essential proceedings had or taken in connection with issuing bonds, the amount of the appropriation bonds to be issued and the maximum interest they are to bear, and all other pertinent matters.

(g) The Minnesota Supreme Court shall issue an order directed against the state and taxpayers, citizens, and others having or claiming any right, title, or interest affected by the issuance of appropriation bonds, or to be affected by the bonds, allowing all persons, in general terms and without naming them, and the state through its attorney general, to

appear before the Minnesota Supreme Court at a designated time and place and show why the complaint should not be granted and the proceedings and appropriation bonds validated. A copy of the complaint and order shall be served on the attorney general at least 20 days before the time fixed for hearing. The attorney general shall examine the complaint, and, if it appears or there is reason to believe that it is defective, insufficient, or untrue, or if in the opinion of the attorney general the issuance of the appropriation bonds in question has not been duly authorized, defense shall be made by the attorney general as the attorney general deems appropriate.

(h) Before the date set for hearing, as directed by the Minnesota Supreme Court, either the clerk of the Minnesota appellate courts or the commissioner shall publish a copy of the order in a legal newspaper of general circulation in Ramsey County and the state, at least once each week for two consecutive weeks, commencing with the first publication, which shall not be less than 20 days before the date set for hearing. By this publication, all taxpayers, citizens, and others having or claiming any right, title, or interest in the state, are made parties defendant to the action and the Minnesota Supreme Court has jurisdiction of them to the same extent as if named as defendants in the complaint and personally served with process.

(i) Any taxpayer, citizen, or person interested may become a party to the action by moving against or pleading to the complaint at or before the time set for hearing. The Minnesota Supreme Court shall determine all questions of law and fact and make orders that will enable it to properly try and determine the action and render a final judgment within 30 days of the hearing with the least possible delay.

(j) If the judgment validates appropriation bonds, the judgment is forever conclusive as to all matters adjudicated and as against all parties affected and all others having or claiming any right, title, or interest affected by the issuance of appropriation bonds, or to be affected in any way by issuing the bonds, and the validity of appropriation bonds or of any revenues pledged for the payment of the bonds, or of the proceedings authorizing the issuance of the bonds, including any remedies provided for their collection, shall never be called in question in any court by any person or party.

(k)(1) Appropriation bonds, when validated under this section, shall have stamped or written on the bonds, by the proper officers of the state issuing them, a statement in substantially the following form: "This appropriation bond is one of a series of appropriation bonds which were validated by judgment of the Supreme Court of the State of Minnesota, rendered on ……. , ... (year)".

(2) A certified copy of the judgment or decree shall be received as evidence in any court in this state.

(l) The costs shall be paid by the state, except when a taxpayer, citizen, or other person contests the action or intervenes, the court may tax the whole or any part of the costs against the person that is equitable.

(m) A justice of the Minnesota Supreme Court is not disqualified in any validation action because the justice is a landowner or taxpayer of the state.

ARTICLE 3

MINNEAPOLIS CONVENTION CENTER

Section 1. **[297A.994] CITY OF MINNEAPOLIS SALES TAX; ALLOCATION OF REVENUES.**

Subdivision 1. **Scope.** Notwithstanding the provisions of section 297A.99, subdivision 11, the provisions of this section govern the remittance of the proceeds of taxes imposed by the city of Minneapolis under the special law.

Subd. 2. **Definitions.** (a) For purposes of this section, the following definitions apply.

(b) "City" means the city of Minneapolis.

(c) "Special law" means Laws 1986, chapter 396, sections 4 and 5, as amended.

(d) "Tax" means the sales taxes imposed by the city under the special law.

(e) The terms defined under section 473J.03 apply for purposes of this section.

Subd. 3. **General allocation of revenues.** The commissioner shall remit the revenues from the taxes, less the deductions listed in this subdivision, to the city at least quarterly. The commissioner shall make the following deductions in the order listed before distribution to the city:

(1) refunds of any of these taxes due to taxpayers, if any;

(2) the direct and indirect costs of the department to administer, audit, and collect the tax, according to the applicable law and agreements between the commissioner and the city. For revenues from the general local sales and use tax, the commissioner must deduct a proportionate share of costs described in section 297A.99, subdivision 11; and

(3) notwithstanding the provisions of any agreement between the commissioner and the city providing for collection and remittance of these taxes, the commissioner must deposit to the general fund the amounts specified in subdivision 4.

Subd. 4. **General fund allocations.** The commissioner must retain and deposit to the general fund the following amounts, as required by subdivision 3, clause (3):

(1) for state bond debt service support beginning in calendar year 2021, and for each calendar year thereafter through calendar year 2046, periodic amounts so that not later than December 31, 2046, an aggregate amount equal to a present value of $150,000,000 has been deposited in the general fund. To determine aggregate present value, the commissioner must consult with the commissioner of management and budget regarding the present value dates, discount rate or rates, and schedules of annual amounts. The present value date or dates must be based on the date or dates bonds are sold under section 16A.965, or the date or dates other state funds, if any, are deposited into the construction fund. The discount rate or rates must be based on the true interest cost of the bonds issued under section 16A.965, or an equivalent 30-year bond index, as determined by the commissioner of management and budget. The schedule of annual amounts must be certified to the commissioner by the commissioner of management and budget and the finance officer of the city;

(2) for the capital improvement reserve appropriation to the sports facilities authority beginning in calendar year 2021, and for each calendar year thereafter through calendar

year 2046, an aggregate annual amount equal to the amount paid by the state for this purpose in that calendar year under section 473J.13, subdivision 4;

(3) for the operating expense appropriation to sports facilities authority beginning in calendar year 2021, and for each calendar year thereafter through calendar year 2046, an aggregate annual amount equal to the amount paid by the state for this purpose in that calendar year under section 473J.13, subdivision 2;

(4) for recapture of state advances for capital improvements and operating expenses for calendar years 2016 through 2020 beginning in calendar year 2021, and for each calendar year thereafter until all amounts under this clause have been paid, proportionate amounts periodically until an aggregate amount equal to the present value of all amounts paid by the state have been deposited in the general fund. To determine the present value of the amounts paid by the state to the authority and the present value of amounts deposited to the general fund under this clause, the commissioner shall consult with the commissioner of management and budget regarding the present value dates, discount rate or rates, and schedule of annual amounts. The present value dates must be based on the dates state funds are paid to the authority, or the dates the commissioner of revenue deposits taxes for purposes of this clause to the general fund. The discount rates must be based on the reasonably equivalent cost of state funds as determined by the commissioner of management and budget. The schedule of annual amounts must be revised to reflect amounts paid under section 473J.13, subdivision 2, paragraph (b) for 2016 to 2020, and subdivision 4, paragraph (c) for 2016 to 2020, and taxes deposited to the general fund from time to time under this clause, and the schedule and revised schedules must be certified to the commissioner by the commissioner of management and budget and the finance officer of the city, and are transferred as accrued from the general fund for repayment of advances made by the state to the authority; and

(5) to capture increases in taxes imposed under the special law, for the benefit of the sports facilities authority, beginning in calendar year 2013 and for each calendar year thereafter through 2046, there shall be deposited to the general fund in proportionate periodic payments in the following year, an amount equal to the following:

(i) 50 percent of the difference, if any, by which the amount of the net annual taxes for the previous year exceeds the sum of the net actual taxes in calendar year 2011 plus $1,000,000, inflated at two percent per year since 2011, minus

(ii) 25 percent of the difference, if any, by which the amount of the net annual taxes for the preceding year exceeds the sum of the net actual taxes in calendar year 2011 plus $3,000,000, inflated at two percent per year since 2011.

Sec. 2. Laws 1986, chapter 396, section 4, as amended by Laws 1987, chapter 55, sections 5 and 6, and Laws 2009, chapter 88, article 4, sections 11 and 12, is amended to read:

Sec. 4. **SALES AND USE TAX.**

Subdivision 1. **Imposition.** Notwithstanding Minnesota Statutes, section 477A.016, or any other contrary provision of law, ordinance, or city charter, upon approval by the city's board of estimate and taxation by a vote of at least five members, the city of Minneapolis may by ordinance impose an additional sales tax of up to one-half of one percent on sales taxable pursuant to Minnesota Statutes, chapter 297A that occur within the city, and may also by ordinance impose an additional compensating use tax of up to one-half of one percent on uses of property within the city, the sale of which would be

subject to the additional sales tax but for the fact such property was sold outside the city. The tax ~~may not be imposed on gross receipts from sales of intoxicating liquor that are exempt from taxation under sections 297A.25 to 297A.257 or other provision of chapter 297A exempting sales of intoxicating liquor and use from taxation, including amendments adopted after enactment of this act~~ is imposed on the tax base defined in Minnesota Statutes, section 297A.99, subdivision 4, and is subject to the exemptions and credits in Minnesota Statutes, section 297A.99, subdivisions 7 and 8.

~~For purposes of this subdivision, sales that occur within the city shall not include (a) the sale of tangible personal property (i) which, without intermediate use, is shipped or transported outside Minneapolis by the purchaser and thereafter used in a trade or business or is stored, processed, fabricated or manufactured into, attached to or incorporated into other tangible personal property transported or shipped outside Minneapolis and thereafter used in a trade or business outside Minneapolis, and which is not thereafter returned to a point within Minneapolis, except in the course of interstate or intrastate commerce (storage shall not constitute intermediate use), or (ii) which the seller delivers to a common carrier for delivery outside Minneapolis, places in the United States mail or parcel post directed to the purchaser outside Minneapolis, or delivers to the purchaser outside Minneapolis by means of the seller's own delivery vehicles, and which is not thereafter returned to a point within Minneapolis, except in the course of interstate or intrastate commerce; or (b) sales which would be described in clause (e) or (u) of Minnesota Statutes, section 297A.25, subdivision 1 if the word "Minneapolis" were substituted for the words "Minnesota" or "state of Minnesota" in such clauses. A tax may be imposed under this section only if the taxes imposed under section 5 are imposed at the maximum rate allowed under that section.~~ The tax authorized by this section ~~shall be imposed,~~ must not be terminated before January 1, 2047. The tax must be imposed and may be adjusted periodically by the city council in conformity with Minnesota Statutes, section 297A.99, subdivision 12, such that the rate imposed, rounded to the next highest one-tenth of one percent, ~~does not exceed the rate estimated to be required to produce~~ produces revenue sufficient to finance the ~~costs~~ purposes described in ~~subdivision~~ subdivisions 3 and 4, and in Minnesota Statutes, section 297A.994, but in no case may the rate exceed one-half of one percent.

Subd. 2. **Enforcement; collection.** (a) Except as provided in paragraph (b), these taxes shall be subject to the same interest, penalties, and other rules imposed under Minnesota Statutes, chapter 297A. The commissioner of revenue may enter into appropriate agreements with the city to provide for collection of these taxes by the state on behalf of the city. The commissioner may charge the city a reasonable fee for its collection from the proceeds of any taxes, as provided in Minnesota Statutes, section 297A.99, subdivision 11.

(b) A taxpayer located outside of the city of Minneapolis who collects use tax under this section in an amount that does not exceed $10 in a reporting period is not required to remit that tax until the amount of use tax collected is $10.

Subd. 3. **Use of property.** Revenues received by the city from the tax may only be used:

~~(1) to pay costs of collection;~~

~~(2)~~ (1) to pay or secure the payment of any principal of, premium or interest on bonds issued in accordance with this act;

~~(3)~~ (2) to pay costs to acquire, design, equip, construct, improve, maintain, operate, administer, or promote the convention center or related facilities, and other capital projects or economic developments under subdivision 4, including financing costs related to them;

~~(4)~~ (3) to pay reasonable and appropriate costs determined by the city to replace housing and the ice arena removed from the site;

~~(5)~~ (4) to maintain reserves for the foregoing purposes deemed reasonable and appropriate by the city; and

~~(6)~~ (5) to fund projects and for other purposes under subdivision 4.

Money for replacement housing shall be made available by the city only for new construction, conversion of nonresidential buildings, and for rehabilitation of vacant residential structures, only if all of the units in the newly constructed building, converted nonresidential building, or rehabilitated residential structure are to be used for replacement housing.

Subd. 4. **Minneapolis downtown and neighborhood projects.** (a) For revenues collected in calendar years 2009 and 2010, to the extent that revenues from the tax authorized in subdivision 1 exceeds the amount needed to fund the purposes in subdivision 3, the city may use the excess revenue to fund any city services. The total amount used in both years for this purpose may not exceed the total amount of aid and credit reductions under Minnesota Statutes, sections 273.1384 and 477A.011 to 477A.014 in calendar years 2008, 2009, and 2010 due to a governor's unallotment or due to statutory reductions.

(b) Beginning with revenues collected in calendar year 2011, to the extent that revenues from the ~~tax~~ taxes authorized in subdivision 1 ~~exceeds~~ or in section 5 exceed the amount needed to fund the purposes in subdivision 3, the city may use the excess revenue in any year to fund capital projects to further residential, cultural, commercial, and economic development in both downtown Minneapolis and the Minneapolis neighborhoods, to fund other city expenditures in support of the basketball arena, other capital projects, or for other economic development, provided the city may direct excess revenue first to convention center debt, operations, capital improvements, and marketing. The city may issue bonds to fund any such projects or improvements using these taxes or any other available city resources to finance or secure the bonds.

Sec. 3. Laws 1986, chapter 396, section 5, as amended by Laws 2001, First Special Session chapter 5, article 12, section 87, is amended to read:

Sec. 5. **LIQUOR, LODGING, AND RESTAURANT TAXES.**

The city may, by resolution, levy in addition to taxes authorized by other law:

(1) a sales tax of not more than three percent on the gross receipts on retail on-sales of intoxicating liquor and fermented malt beverages ~~described in section 473.592 occurring in the~~ when sold at licensed on-sale liquor establishments located within the downtown taxing area, provided that this tax may not be imposed if sales of intoxicating liquor and fermented malt beverages are exempt from taxation under chapter 297A;

(2) a sales tax of not more than three percent on the gross receipts from the furnishing for consideration of lodging ~~described in section 473.592~~ for a period of less than 30 days at a hotel, motel, rooming house, tourist court, or trailer camp located within the city by a hotel or motel which has more than 50 rooms available for lodging; the tax imposed under this clause shall be at a rate that, when added to the sum of the rate of the sales tax imposed

under Minnesota Statutes, chapter 297A, the rate of the sales tax imposed under section 4, and the rate of any other taxes on lodging in the city of Minneapolis, equals 13 percent; and

(3) a sales tax of not more than three percent on the gross receipts on all sales of food primarily for consumption on or off the premises by restaurants and places of refreshment as defined by resolution of the city that occur within the downtown taxing area.

The taxes authorized by this section must not be terminated before January 1, 2047. The taxes shall be imposed and may be adjusted periodically by the city council such that the rates imposed produce revenue sufficient, together with the tax imposed under section 4, to finance the purposes described in Minnesota Statutes, section 297A.994, and section 4, subdivisions 3 and 4. These taxes shall be applied, first, as provided in Minnesota Statutes, section 297A.994, subdivision 3, clauses (1) to (3), and then, solely to pay ~~costs of collection and to pay or~~, secure, maintain, and fund the payment of any principal of, premium on, and interest on any bonds or any ~~costs referred to~~ other purposes in section 4, subdivision 3 or 4. The commissioner of revenue may enter into appropriate agreements with the city to provide for the collection of these taxes by the state on behalf of the city. ~~The commissioner may charge the city a reasonable fee for its collection from the proceeds of any taxes.~~ These taxes shall be subject to the same interest, penalties, and enforcement provisions as the taxes imposed under ~~section 473.592~~ Minnesota Statutes, chapter 297A.

Sec. 4. **CHARTER LIMITATIONS, REQUIREMENTS NOT TO APPLY.**

Any amounts expended, indebtedness, or obligation incurred including, but not limited to, the issuance of bonds, or actions taken by the city under this act, are deemed not an expenditure or other use of city resources within the meaning of any law or charter provision. The city may exercise any of its powers under this act to spend, borrow, tax, or incur any form of indebtedness or other obligation for the improvement, including, but not limited to, acquisition, development, construction, or betterment of any public building, stadium, or other capital improvement project, without regard to any charter limitation, requirement, or provision, including any referendum requirement. Any tax exemption established under this act shall be deemed not an expenditure or other use of city resources within the meaning of any charter provision.

Sec. 5. **SEVERABILITY; SAVINGS.**

If any part of this article is found to be invalid because it is in conflict with a provision of the Minnesota Constitution or for any other reason, all other provisions of this article shall remain valid and any rights, remedies, and privileges that have been otherwise accrued by this article, shall remain in effect and may be proceeded with and concluded under the provisions of this article.

Sec. 6. **LOCAL SALES TAX REQUIREMENTS NOT TO APPLY.**

The taxes authorized under Laws 1986, chapter 396, sections 4 and 5, as amended, are exempt from the requirements of Minnesota Statutes, section 297A.99, subdivisions 2 and 3.

Sec. 7. **EFFECTIVE DATE; LOCAL APPROVAL.**

This article is effective the day after the governing body of the city of Minneapolis and its chief clerical officer comply with Minnesota Statutes, section 645.021, subdivisions 2 and 3. Notwithstanding any law to the contrary, the city of Minneapolis and its chief

clerical officer have 30 calendar days following final enactment of this act, to comply with Minnesota Statutes, section 645.021, subdivisions 2 and 3.

ARTICLE 4

LAWFUL GAMBLING

Section 1. Minnesota Statutes 2010, section 297E.01, subdivision 7, is amended to read:

Subd. 7. **Gambling product.** "Gambling product" means bingo hard cards, bingo paper sheets, ~~or~~ linked bingo paper sheets, or electronic linked bingo games; pull-tabs; electronic pull-tab games; tipboards; paddle tickets and paddle ticket cards; raffle tickets; or any other ticket, card, board, placard, device, or token that represents a chance, for which consideration is paid, to win a prize.

EFFECTIVE DATE. This section is effective July 1, 2012.

Sec. 2. Minnesota Statutes 2010, section 297E.01, subdivision 8, is amended to read:

Subd. 8. **Gross receipts.** "Gross receipts" means all receipts derived from lawful gambling activity including, but not limited to, the following items:

(1) gross sales of bingo hard cards ~~and~~, paper sheets, linked bingo paper sheets, and electronic linked bingo games before reduction for prizes, expenses, shortages, free plays, or any other charges or offsets;

(2) the ideal gross of pull-tab, electronic pull-tab games, and tipboard deals or games less the value of unsold and defective tickets and before reduction for prizes, expenses, shortages, free plays, or any other charges or offsets;

(3) gross sales of raffle tickets and paddle tickets before reduction for prizes, expenses, shortages, free plays, or any other charges or offsets;

(4) admission, commission, cover, or other charges imposed on participants in lawful gambling activity as a condition for or cost of participation; and

(5) interest, dividends, annuities, profit from transactions, or other income derived from the accumulation or use of gambling proceeds.

Gross receipts does not include proceeds from rental under section 349.18, subdivision 3.

EFFECTIVE DATE. This section is effective July 1, 2012.

Sec. 3. Minnesota Statutes 2010, section 297E.01, subdivision 9, is amended to read:

Subd. 9. **Ideal gross.** "Ideal gross" means the total amount of receipts that would be received if every individual ticket in the pull-tab, electronic pull-tab games or tipboard deal, paddle wheel game, and raffle ticket was sold at its face value. In the calculation of ideal gross and prizes, a free play ticket pull-tab or electronic pull-tab shall be valued at face value. Ideal gross also means the total amount of receipts that would be received if every bingo paper sheet, linked bingo paper sheet, and electronic linked bingo games were sold at face value.

EFFECTIVE DATE. This section is effective July 1, 2012.

Sec. 4. Minnesota Statutes 2010, section 297E.02, subdivision 1, is amended to read:

Subdivision 1. **Imposition.** A tax is imposed on all lawful gambling other than (1) paper or electronic pull-tab deals or games; (2) tipboard deals or games; ~~and~~ (3) electronic linked bingo; and (4) items listed in section 297E.01, subdivision 8, clauses (4) and (5), at the rate of 8.5 percent on the gross receipts as defined in section 297E.01, subdivision 8, less prizes actually paid. The tax imposed by this subdivision is in lieu of the tax imposed by section 297A.62 and all local taxes and license fees except a fee authorized under section 349.16, subdivision 8, or a tax authorized under subdivision 5.

The tax imposed under this subdivision is payable by the organization or party conducting, directly or indirectly, the gambling.

EFFECTIVE DATE. This section is effective for games reported as played after June 30, 2012.

Sec. 5. Minnesota Statutes 2010, section 297E.02, subdivision 3, is amended to read:

Subd. 3. **Collection; disposition.** (a) Taxes imposed by this section ~~other than in subdivision 4~~ are due and payable to the commissioner when the gambling tax return is required to be filed. ~~Taxes imposed by subdivision 4 are due and payable to the commissioner on or before the last business day of the month following the month in which the taxable sale was made.~~ Distributors must file their monthly sales figures with the commissioner on a form prescribed by the commissioner. Returns covering the taxes imposed under this section must be filed with the commissioner on or before the 20th day of the month following the close of the previous calendar month. The commissioner may require that the returns be filed via magnetic media or electronic data transfer. The proceeds, along with the revenue received from all license fees and other fees under sections 349.11 to 349.191, 349.211, and 349.213, must be paid to the commissioner of management and budget for deposit in the general fund.

(b) The sales tax imposed by chapter 297A on the sale of pull-tabs and tipboards by the distributor is imposed on the retail sales price. The retail sale of pull-tabs or tipboards by the organization is exempt from taxes imposed by chapter 297A and is exempt from all local taxes and license fees except a fee authorized under section 349.16, subdivision 8.

(c) One-half of one percent of the revenue deposited in the general fund under paragraph (a), is appropriated to the commissioner of human services for the compulsive gambling treatment program established under section 245.98. One-half of one percent of the revenue deposited in the general fund under paragraph (a), is appropriated to the commissioner of human services for a grant to the state affiliate recognized by the National Council on Problem Gambling to increase public awareness of problem gambling, education and training for individuals and organizations providing effective treatment services to problem gamblers and their families, and research relating to problem gambling. Money appropriated by this paragraph must supplement and must not replace existing state funding for these programs.

EFFECTIVE DATE. This section is effective July 1, 2012.

Sec. 6. Minnesota Statutes 2010, section 297E.02, subdivision 6, is amended to read:

Subd. 6. **Combined net receipts tax.** (a) In addition to the taxes imposed under subdivisions 1 ~~and 4~~, a tax is imposed on the combined receipts of the organization. As

used in this section, "combined net receipts" is the sum of the organization's gross receipts from lawful gambling less gross receipts directly derived from the conduct of paper bingo, raffles, and paddle wheels, as defined in section 297E.01, subdivision 8, and less the net prizes actually paid, other than prizes actually paid for paper bingo, raffles, and paddle wheels, for the fiscal year. The combined net receipts of an organization are subject to a tax computed according to the following schedule:

If the combined net receipts for the fiscal year are:	The tax is:
Not over ~~$500,000~~ $87,500	~~zero~~ nine percent
Over ~~$500,000~~ $87,500, but not over ~~$700,000~~ $122,500	~~1.7~~ $7,875 plus 18 percent of the amount over ~~$500,000~~ $87,500, but not over ~~$700,000~~ $122,500
Over ~~$700,000~~ $122,500, but not over ~~$900,000~~ $157,500	~~$3,400~~ $14,175 plus ~~3.4~~ 27 percent of the amount over ~~$700,000~~ $122,500, but not over ~~$900,000~~ $157,500
Over ~~$900,000~~ $157,500	~~$10,200~~ $23,625 plus ~~5.1~~ 36 percent of the amount over ~~$900,000~~ $157,500

(b) On or before April 1, 2016, the commissioner shall estimate the total amount of revenue, including interest and penalties, that will be collected for fiscal year 2016 from taxes imposed under this chapter. If the amount estimated by the commissioner equals or exceeds $94,800,000, the commissioner shall certify that effective July 1, 2016, the rates under this paragraph apply in lieu of the rates under paragraph (a) and shall publish a notice to that effect in the state register and notify each taxpayer by June 1, 2016. If the rates under this section apply, the combined net receipts of an organization are subject to a tax computed according to the following schedule:

If the combined net receipts for the fiscal year are:	The tax is:
Not over $87,500	8.5 percent
Over $87,500, but not over $122,500	$7,438 plus 17 percent of the amount over $87,500, but not over $122,500
Over $122,500, but not over $157,500	$13,388 plus 25.5 percent of the amount over $122,500, but not over $157,500
Over $157,500	$22,313 plus 34 percent of the amount over $157,500

(c) Gross receipts derived from sports-themed tipboards are exempt from taxation under this section. For purposes of this paragraph, a sports-themed tipboard means a sports-themed tipboard as defined in section 349.12, subdivision 34, under which the winning numbers are determined by the numerical outcome of a professional sporting event.

EFFECTIVE DATE. This section is effective July 1, 2012.

Sec. 7. Minnesota Statutes 2010, section 297E.02, is amended by adding a subdivision to read:

Subd. 6a. **Unaccounted games.** If a licensed distributor cannot account for a pull-tab game, an electronic pull-tab game, a tipboard deal, paddletickets, an electronic linked bingo game, bingo paper sheets, or linked bingo paper sheets, the distributor must report the sheets or games to the commissioner as lost and remit a tax of six percent on the ideal gross of the sheets or games.

EFFECTIVE DATE. This section is effective July 1, 2012.

Sec. 8. Minnesota Statutes 2010, section 297E.02, subdivision 7, is amended to read:

Subd. 7. **Untaxed gambling product.** (a) In addition to penalties or criminal sanctions imposed by this chapter, a person, organization, or business entity possessing or selling a pull-tab, electronic pull-tab game or tipboard upon which the tax imposed by ~~subdivision 4~~ this chapter has not been paid is liable for a tax of six percent of the ideal gross of each pull-tab, electronic pull-tab game, or tipboard. The tax on a partial deal must be assessed as if it were a full deal.

(b) In addition to penalties and criminal sanctions imposed by this chapter, a person not licensed by the board who conducts bingo, linked bingo, electronic linked bingo, raffles, or paddle wheel games is liable for a tax of six percent of the gross receipts from that activity.

(c) The tax must be assessed by the commissioner. An assessment must be considered a jeopardy assessment or jeopardy collection as provided in section 270C.36. The commissioner shall assess the tax based on personal knowledge or information available to the commissioner. The commissioner shall mail to the taxpayer at the taxpayer's last known address, or serve in person, a written notice of the amount of tax, demand its immediate payment, and, if payment is not immediately made, collect the tax by any method described in chapter 270C, except that the commissioner need not await the expiration of the times specified in chapter 270C. The tax assessed by the commissioner is presumed to be valid and correctly determined and assessed. The burden is upon the taxpayer to show its incorrectness or invalidity. The tax imposed under this subdivision does not apply to gambling that is exempt from taxation under subdivision 2.

EFFECTIVE DATE. This section is effective July 1, 2012.

Sec. 9. Minnesota Statutes 2010, section 297E.02, subdivision 10, is amended to read:

Subd. 10. **Refunds; appropriation.** A person who has, under this chapter, paid to the commissioner an amount of tax for a period in excess of the amount legally due for that period, may file with the commissioner a claim for a refund of the excess. The amount necessary to pay the refunds under this subdivision ~~and subdivision 4, paragraph (d),~~ is appropriated from the general fund to the commissioner.

EFFECTIVE DATE. This section is effective July 1, 2012.

Sec. 10. Minnesota Statutes 2010, section 297E.02, subdivision 11, is amended to read:

Subd. 11. ~~**Unplayed or** **Defective** **pull-tabs or tipboards**~~ **gambling products.** ~~If a deal of pull-tabs or tipboards registered with the board or bar coded in accordance with this chapter and chapter 349 and upon which the tax imposed by subdivision 4 has been paid is returned unplayed to the distributor, the commissioner shall allow a refund of the tax paid.~~

If a defective deal registered with the board or bar coded in accordance with this chapter and chapter 349 ~~and upon which the taxes have been paid~~ is returned to the manufacturer, the distributor shall submit to the commissioner of revenue certification from the manufacturer that the deal was returned and in what respect it was defective. The certification must be on a form prescribed by the commissioner and must contain additional information the commissioner requires.

The commissioner may require ~~that no refund~~ under this subdivision ~~be made unless the~~ that all defective and returned pull-tabs ~~or~~, tipboards ~~have been~~, paddle tickets, paper bingo sheets, and linked bingo paper sheets be set aside for inspection by the commissioner's employee.

Reductions in previously paid taxes authorized by this subdivision must be made when and in the manner prescribed by the commissioner.

EFFECTIVE DATE. This section is effective for games sold by a licensed distributor after June 30, 2012.

Sec. 11. **[297E.021] SPECIAL ALLOCATION OF REVENUES.**

Subdivision 1. **Application; revenues not pledged.** The provisions of this subdivision apply only after the issuance of appropriation bonds under section 16A.965, subdivision 2, but do not constitute a pledge of available revenues as security for payment of principal and interest on appropriation bonds issued under section 16A.965.

Subd. 2. **Determination of revenue increase.** By March 15 of each fiscal year, the commissioner of management and budget, in consultation with the commissioner, shall determine the estimated increase in revenues received from taxes imposed under this chapter over the estimated revenues under the February 2012 state budget forecast for that fiscal year. For fiscal years after fiscal year 2015, the commissioner of management and budget shall use the February 2012 state budget forecast for fiscal year 2015 as the baseline. All calculations under this subdivision must be made net of estimated refunds of the taxes required to be paid.

Subd. 3. **Available revenues.** For purposes of this section, "available revenues" equals the amount determined under subdivision 2:

(1) reduced by the following amounts paid for the fiscal year under:

(i) the appropriation to principal and interest on appropriation bonds under section 16A.965, subdivision 8;

(ii) the appropriation from the general fund to make operating expense payments under section 473J.13, subdivision 2, paragraph (b);

(iii) the appropriation for contributions to the capital reserve fund under section 473J.13, subdivision 4, paragraph (c);

(iv) the appropriations under this article for administration and any successor appropriation;

(v) the reduction in revenues resulting from the sales tax exemptions under section 297A.71, subdivision 43;

(vi) reimbursements authorized by section 473J.15, subdivision 2, paragraph (d);

(vii) the compulsive gambling appropriations under section 297E.02, subdivision 3, paragraph (c), and any successor appropriation; and

(viii) the appropriation for the city of St. Paul under section 16A.726, paragraph (c); and

(2) increased by the revenue deposited in the general fund under section 297A.994, subdivision 4, clauses (1) to (3), for the fiscal year.

Subd. 4. **Appropriation; general reserve account.** To the extent the commissioner determines that revenues are available under subdivision 3 for the fiscal year, those amounts are appropriated from the general fund for deposit in a general reserve account established by order of the commissioner of management and budget. Amounts in this reserve are appropriated as necessary for application against any shortfall in the amounts deposited to the general fund under section 297A.994 or, after consultation with the legislative commission on planning and fiscal policy, amounts in this reserve are appropriated to the commissioner of management and budget for other uses related to the stadium authorized under section 473J.03, subdivision 7, that the commissioner deems financially prudent including but not limited to reimbursements for capital and operating costs relating to the stadium, refundings, and prepayment of debt. In no event, shall available revenues be pledged, nor shall the appropriations of available revenues made by this section constitute a pledge of available revenues as security for the prepayment of principal and interest on the appropriation bonds under section 16A.965.

Sec. 12. Minnesota Statutes 2010, section 297E.13, subdivision 5, is amended to read:

Subd. 5. **Untaxed gambling equipment.** It is a gross misdemeanor for a person to possess gambling equipment for resale in this state that has not been stamped or bar-coded in accordance with this chapter and chapter 349 and upon which the taxes imposed by chapter 297A or section 297E.02~~, subdivision 4,~~ have not been paid. The director of alcohol and gambling enforcement or the commissioner or the designated inspectors and employees of the director or commissioner may seize in the name of the state of Minnesota any unregistered or untaxed gambling equipment.

EFFECTIVE DATE. This section is effective for actions occurring after June 30, 2012.

Sec. 13. Minnesota Statutes 2010, section 349.12, subdivision 3b, is amended to read:

Subd. 3b. **Bar operation.** "Bar operation" means a method of selling and redeeming disposable gambling equipment by an employee of the lessor within a leased premises which is licensed for the on-sale of alcoholic beverages ~~where such sales and redemptions are made by an employee of the lessor from a common area where food and beverages are also sold~~.

Sec. 14. Minnesota Statutes 2010, section 349.12, subdivision 3c, is amended to read:

Subd. 3c. **Bar bingo.** "Bar bingo" is a bingo occasion conducted at a permitted premises in an area where intoxicating liquor or 3.2 percent malt beverages are sold and

where the licensed organization conducts another form of lawful gambling. Bar bingo does not include bingo games linked to other permitted premises.

Sec. 15. Minnesota Statutes 2010, section 349.12, subdivision 5, is amended to read:

Subd. 5. **Bingo occasion.** "Bingo occasion" means a single gathering or session at which a series of one or more successive bingo games is played. There is no limit on the number of games conducted during a bingo occasion ~~but~~. A bingo occasion must not last longer than eight consecutive hours~~.~~, except that linked bingo games played on electronic bingo devices may be played during regular business hours of the permitted premises, and all play during this period is considered a bingo occasion for reporting purposes. For permitted premises where the primary business is bingo, regular business hours shall be defined as the hours between 8:00 a.m. and 2:00 a.m.

Sec. 16. Minnesota Statutes 2010, section 349.12, subdivision 6a, is amended to read:

Subd. 6a. **Booth operation.** "Booth operation" means a method of selling and redeeming disposable gambling equipment by an employee of a licensed organization in a premises the organization leases or owns ~~where such sales and redemptions are made within a separate enclosure that is distinct from areas where food and beverages are sold~~.

Sec. 17. Minnesota Statutes 2010, section 349.12, subdivision 12a, is amended to read:

Subd. 12a. **Electronic bingo device.** "Electronic bingo device" means ~~an~~ a handheld and portable electronic device that:

(a) is used by a bingo player to:

(1) monitor bingo paper sheets or a facsimile of a bingo paper sheet ~~which~~ purchased and played at the time and place of an organization's bingo occasion ~~and which (1) provides a means for bingo players to~~, or to play an electronic bingo game that is linked with other permitted premises;

(2) activate numbers announced ~~by a bingo caller; (2) compares~~ or displayed, and to compare the numbers ~~entered by the player~~ to the bingo faces previously stored in the memory of the device; ~~and~~

(3) ~~identifies~~ identify a winning bingo pattern~~.~~ or game requirement; and

(4) play against other bingo players;

(b) limits the play of bingo faces to 36 faces per game;

(c) requires coded entry to activate play but does not allow the use of a coin, currency, or tokens to be inserted to activate play;

(d) may only be used for play against other bingo players in a bingo game;

(e) has no additional function as an amusement or gambling device other than as an electronic pull-tab game defined under section 349.12, subdivision 12c;

(f) has the capability to ensure adequate levels of security internal controls;

(g) has the capability to permit the board to electronically monitor the operation of the device and the internal accounting systems; and

(h) has the capability to allow use by a player who is visually impaired.

~~Electronic bingo device does not mean any device into which coin, currency, or tokens are inserted to activate play.~~

Sec. 18. Minnesota Statutes 2010, section 349.12, is amended by adding a subdivision to read:

Subd. 12b. **Electronic pull-tab device.** "Electronic pull-tab device" means a handheld and portable electronic device that:

(1) is used to play one or more electronic pull-tab games;

(2) requires coded entry to activate play but does not allow the use of coin, currency, or tokens to be inserted to activate play;

(3) requires that a player must activate or open each electronic pull-tab ticket and each individual line, row, or column of each electronic pull-tab ticket;

(4) maintains information pertaining to accumulated win credits that may be applied to games in play or redeemed upon termination of play;

(5) has no spinning reels or other representations that mimic a video slot machine;

(6) has no additional function as a gambling device other than as an electronic-linked bingo game played on a device defined under section 349.12, subdivision 12a;

(7) may incorporate an amusement game feature as part of the pull-tab game but may not require additional consideration for that feature or award any prize, or other benefit for that feature;

(8) may have auditory or visual enhancements to promote or provide information about the game being played, provided the component does not affect the outcome of a game or display the results of a game;

(9) maintains, on nonresettable meters, a printable, permanent record of all transactions involving each device and electronic pull-tab games played on the device;

(10) is not a pull-tab dispensing device as defined under subdivision 32a; and

(11) has the capability to allow use by a player who is visually impaired.

Sec. 19. Minnesota Statutes 2010, section 349.12, is amended by adding a subdivision to read:

Subd. 12c. **Electronic pull-tab game.** "Electronic pull-tab game" means a pull-tab game containing:

(a) facsimiles of pull-tab tickets that are played on an electronic pull-tab device;

(b) a predetermined, finite number of winning and losing tickets, not to exceed 7,500 tickets;

(c) the same price for each ticket in the game;

(d) a price paid by the player of not less than 25 cents per ticket;

(e) tickets that are in conformance with applicable board rules for pull-tabs;

(f) winning tickets that comply with prize limits under section 349.211;

(g) a unique serial number that may not be regenerated;

(h) an electronic flare that displays the game name, form number, predetermined, finite number of tickets in the game, and prize tier; and

(i) no spinning reels or other representations that mimic a video slot machine.

Sec. 20. Minnesota Statutes 2010, section 349.12, is amended by adding a subdivision to read:

Subd. 12d. **Electronic pull-tab game system.** "Electronic pull-tab game system" means the equipment leased from a licensed distributor and used by a licensed organization to conduct, manage, and record electronic pull-tab games, and to report and transmit the game results as prescribed by the board and the Department of Revenue. The system must provide security and access levels sufficient so that internal control objectives are met as prescribed by the board. The system must contain a point of sale station.

Sec. 21. Minnesota Statutes 2010, section 349.12, is amended by adding a subdivision to read:

Subd. 15b. **501(c)(19) organization.** "501(c)(19) organization" is an organization exempt from the payment of federal income taxes under section 501(c)(19) of the Internal Revenue Code.

Sec. 22. Minnesota Statutes 2010, section 349.12, subdivision 18, is amended to read:

Subd. 18. **Gambling equipment.** "Gambling equipment" means~~:~~ gambling equipment that is either disposable or permanent gambling equipment.

(a) Disposable gambling equipment includes the following:

(1) bingo hard cards or paper sheets, including linked bingo paper sheets~~, devices for selecting bingo numbers, electronic bingo devices,~~;

(2) paper and electronic pull-tabs~~,~~;

(3) jar tickets~~, paddle wheels, paddle wheel tables,~~;

(4) paddle tickets~~;~~ and paddle ticket cards~~,~~;

(5) tipboards~~;~~ and tipboard tickets~~,~~; and

(6) promotional tickets that mimic a pull-tab or tipboard~~, pull-tab dispensing devices, and programmable electronic devices that have no effect on the outcome of a game and are used to provide a visual or auditory enhancement of a game~~.

(b) Permanent gambling equipment includes the following:

(1) devices for selecting bingo numbers;

(2) electronic bingo devices;

(3) electronic pull-tab devices;

(4) pull-tab dispensing devices;

(5) programmable electronic devices that have no effect on the outcome of a game and are used to provide a visual or auditory enhancement of a game;

(6) paddle wheels; and

(7) paddle wheel tables.

Sec. 23. Minnesota Statutes 2010, section 349.12, subdivision 25, is amended to read:

Subd. 25. **Lawful purpose.** (a) "Lawful purpose" means one or more of the following:

(1) any expenditure by or contribution to a 501(c)(3) or festival organization, as defined in subdivision 15a, provided that the organization and expenditure or contribution are in conformity with standards prescribed by the board under section 349.154, which standards must apply to both types of organizations in the same manner and to the same extent;

(2) a contribution to or expenditure for goods and services for an individual or family suffering from poverty, homelessness, or disability, which is used to relieve the effects of that suffering;

(3) a contribution to a program recognized by the Minnesota Department of Human Services for the education, prevention, or treatment of problem gambling;

(4) a contribution to or expenditure on a public or private nonprofit educational institution registered with or accredited by this state or any other state;

(5) a contribution to an individual, public or private nonprofit educational institution registered with or accredited by this state or any other state, or to a scholarship fund of a nonprofit organization whose primary mission is to award scholarships, for defraying the cost of education to individuals where the funds are awarded through an open and fair selection process;

(6) activities by an organization or a government entity which recognize military service to the United States, the state of Minnesota, or a community, subject to rules of the board, provided that the rules must not include mileage reimbursements in the computation of the per diem reimbursement limit and must impose no aggregate annual limit on the amount of reasonable and necessary expenditures made to support:

(i) members of a military marching or color guard unit for activities conducted within the state;

(ii) members of an organization solely for services performed by the members at funeral services;

(iii) members of military marching, color guard, or honor guard units may be reimbursed for participating in color guard, honor guard, or marching unit events within the state or states contiguous to Minnesota at a per participant rate of up to $35 per diem; or

(iv) active military personnel and their immediate family members in need of support services;

(7) recreational, community, and athletic facilities and activities intended primarily for persons under age 21, provided that such facilities and activities do not discriminate on the basis of gender and the organization complies with section 349.154, subdivision 3a;

(8) payment of local taxes authorized under this chapter, taxes imposed by the United States on receipts from lawful gambling, the taxes imposed by section 297E.02, subdivisions 1, ~~4~~, 5, and 6, and the tax imposed on unrelated business income by section 290.05, subdivision 3;

(9) payment of real estate taxes and assessments on permitted gambling premises owned by the licensed organization paying the taxes, or wholly leased by a licensed

veterans organization under a national charter recognized under section 501(c)(19) of the Internal Revenue Code;

(10) a contribution to the United States, this state or any of its political subdivisions, or any agency or instrumentality thereof other than a direct contribution to a law enforcement or prosecutorial agency;

(11) a contribution to or expenditure by a nonprofit organization which is a church or body of communicants gathered in common membership for mutual support and edification in piety, worship, or religious observances;

(12) an expenditure for citizen monitoring of surface water quality by individuals or nongovernmental organizations that is consistent with section 115.06, subdivision 4, and Minnesota Pollution Control Agency guidance on monitoring procedures, quality assurance protocols, and data management, provided that the resulting data is submitted to the Minnesota Pollution Control Agency for review and inclusion in the state water quality database;

(13) a contribution to or expenditure on projects or activities approved by the commissioner of natural resources for:

(i) wildlife management projects that benefit the public at large;

(ii) grant-in-aid trail maintenance and grooming established under sections 84.83 and 84.927, and other trails open to public use, including purchase or lease of equipment for this purpose; and

(iii) supplies and materials for safety training and educational programs coordinated by the Department of Natural Resources, including the Enforcement Division;

(14) conducting nutritional programs, food shelves, and congregate dining programs primarily for persons who are age 62 or older or disabled;

(15) a contribution to a community arts organization, or an expenditure to sponsor arts programs in the community, including but not limited to visual, literary, performing, or musical arts;

(16) an expenditure by a licensed fraternal organization or a licensed veterans organization for payment of water, fuel for heating, electricity, and sewer costs for:

(i) up to 100 percent for a building wholly owned or wholly leased by and used as the primary headquarters of the licensed veteran or fraternal organization; or

(ii) a proportional amount subject to approval by the director and based on the portion of a building used as the primary headquarters of the licensed veteran or fraternal organization;

(17) expenditure by a licensed veterans organization of up to $5,000 in a calendar year in net costs to the organization for meals and other membership events, limited to members and spouses, held in recognition of military service. No more than $5,000 can be expended in total per calendar year under this clause by all licensed veterans organizations sharing the same veterans post home;

(18) payment of fees authorized under this chapter imposed by the state of Minnesota to conduct lawful gambling in Minnesota;

(19) a contribution or expenditure to honor an individual's humanitarian service as demonstrated through philanthropy or volunteerism to the United States, this state, or local community;

(20) a contribution by a licensed organization to another licensed organization with prior board approval, with the contribution designated to be used for one or more of the following lawful purposes under this section: clauses (1) to (7), (11) to (15), (19), and (25);

(21) an expenditure that is a contribution to a parent organization, if the parent organization: (i) has not provided to the contributing organization within one year of the contribution any money, grants, property, or other thing of value, and (ii) has received prior board approval for the contribution that will be used for a program that meets one or more of the lawful purposes under subdivision 7a;

(22) an expenditure for the repair, maintenance, or improvement of real property and capital assets owned by an organization, or for the replacement of a capital asset that can no longer be repaired, with a fiscal year limit of five percent of gross profits from the previous fiscal year, with no carryforward of unused allowances. The fiscal year is July 1 through June 30. Total expenditures for the fiscal year may not exceed the limit unless the board has specifically approved the expenditures that exceed the limit due to extenuating circumstances beyond the organization's control. An expansion of a building or bar-related expenditures are not allowed under this provision.

(i) The expenditure must be related to the portion of the real property or capital asset that must be made available for use free of any charge to other nonprofit organizations, community groups, or service groups, ~~or~~ and is used for the organization's primary mission or headquarters.

(ii) An expenditure may be made to bring an existing building that the organization owns into compliance with the Americans with Disabilities Act.

(iii) An organization may apply the amount that is allowed under item (ii) to the erection or acquisition of a replacement building that is in compliance with the Americans with Disabilities Act if the board has specifically approved the amount. The cost of the erection or acquisition of a replacement building may not be made from gambling proceeds, except for the portion allowed under this item;

(23) an expenditure for the acquisition or improvement of a capital asset with a cost greater than $2,000, excluding real property, that will be used exclusively for lawful purposes under this section if the board has specifically approved the amount;

(24) an expenditure for the acquisition, erection, improvement, or expansion of real property, if the board has first specifically authorized the expenditure after finding that the real property will be used exclusively for lawful purpose under this section; ~~or~~

(25) an expenditure, including a mortgage payment or other debt service payment, for the erection or acquisition of a comparable building to replace an organization-owned building that was destroyed or made uninhabitable by fire or catastrophe or to replace an organization-owned building that was taken or sold under an eminent domain proceeding. The expenditure may be only for that part of the replacement cost not reimbursed by insurance for the fire or catastrophe or compensation not received from a governmental unit under the eminent domain proceeding, if the board has first specifically authorized the expenditure~~.~~; or

(26) a contribution to a 501(c)(19) organization that does not have an organization license under section 349.16 and is not affiliated with the contributing organization, and whose owned or leased property is not a permitted premises under section 349.165. The 501(c)(19) organization may only use the contribution for lawful purposes under this subdivision or for the organization's primary mission. The 501(c)(19) organization may not use the contribution for expansion of a building or for bar-related expenditures. A contribution may not be made to a statewide organization representing a consortia of 501(c)(19) organizations.

(b) Expenditures authorized by the board under clauses (24) and (25) must be 51 percent completed within two years of the date of board approval; otherwise the organization must reapply to the board for approval of the project. "Fifty-one percent completed" means that the work completed must represent at least 51 percent of the value of the project as documented by the contractor or vendor.

(c) Notwithstanding paragraph (a), "lawful purpose" does not include:

(1) any expenditure made or incurred for the purpose of influencing the nomination or election of a candidate for public office or for the purpose of promoting or defeating a ballot question;

(2) any activity intended to influence an election or a governmental decision-making process;

(3) a contribution to a statutory or home rule charter city, county, or town by a licensed organization with the knowledge that the governmental unit intends to use the contribution for a pension or retirement fund; or

(4) a contribution to a 501(c)(3) organization or other entity with the intent or effect of not complying with lawful purpose restrictions or requirements.

EFFECTIVE DATE. This section is effective July 1, 2012.

Sec. 24. Minnesota Statutes 2010, section 349.12, subdivision 25b, is amended to read:

Subd. 25b. **Linked bingo game provider.** "Linked bingo game provider" means any person who provides the means to link bingo ~~prizes in a linked bingo game, who provides linked bingo paper sheets to the participating organizations~~ games, who provides linked bingo prize management, and who provides the linked bingo game system.

Sec. 25. Minnesota Statutes 2010, section 349.12, subdivision 25c, is amended to read:

Subd. 25c. **Linked bingo game system.** "Linked bingo game system" means the equipment used by the linked bingo provider to conduct, transmit, and track a linked bingo game. The system must be approved by the board before its use in this state and it must have ~~dial-up or other~~ the capability to permit the board to electronically monitor its operation remotely. For linked electronic bingo games, the system includes electronic bingo devices.

Sec. 26. Minnesota Statutes 2010, section 349.12, subdivision 25d, is amended to read:

Subd. 25d. **Linked bingo prize pool.** "Linked bingo prize pool" means the total of all prize money that each participating organization has contributed to a linked bingo game prize and includes any portion of the prize pool that is carried over from one ~~occasion~~ game to another in a progressive linked bingo game.

Sec. 27. Minnesota Statutes 2010, section 349.12, subdivision 29, is amended to read:

Subd. 29. **Paddle wheel.** "Paddle wheel" means a vertical wheel marked off into sections containing one or more numbers, and which, after being turned or spun, uses a pointer or marker to indicate winning chances, and may only be used to determine a winning number or numbers matching a winning paddle ticket purchased by a player. A paddle wheel may be an electronic device that simulates a paddle wheel.

Sec. 28. Minnesota Statutes 2010, section 349.12, subdivision 31, is amended to read:

Subd. 31. **Promotional ticket.** A paper pull-tab ticket or paper tipboard ticket created and printed by a licensed manufacturer with the words "no purchase necessary" and "for promotional use only" and for which no consideration is given is a promotional ticket.

Sec. 29. Minnesota Statutes 2010, section 349.12, subdivision 32, is amended to read:

Subd. 32. **Pull-tab.** "Pull-tab" means a single folded or banded paper ticket ~~or a~~, multi-ply card with perforated break-open tabs, or a facsimile of a paper pull-tab ticket used in conjunction with an electronic pull-tab device, the face of which is initially covered to conceal one or more numbers or symbols, and where one or more of each set of tickets ~~or~~, cards, or facsimiles has been designated in advance as a winner.

Sec. 30. Minnesota Statutes 2010, section 349.12, subdivision 34, is amended to read:

Subd. 34. **Tipboard.** "Tipboard" means a board, placard or other device containing a seal that conceals the winning number or symbol, and that serves as the game flare for a tipboard game. A sports-themed tipboard is a board, placard, or other device that contains a grid of predesignated numbers for which the winning numbers are determined in whole or in part by the numerical outcome of one or more professional sporting events, serves as the game flare for player registration, but is not required to contain a seal. For a sports-themed tipboard, the winning numbers must be determined solely by the numerical outcome.

Sec. 31. Minnesota Statutes 2010, section 349.12, subdivision 35, is amended to read:

Subd. 35. **Tipboard ticket.** "Tipboard ticket" is a single folded or banded ticket, or multi-ply card, the face of which is initially covered or otherwise hidden from view to conceal a number, symbol, or set of symbols, some of which have been designated in advance and at random as prize winners. For a sports-themed tipboard, the tipboard ticket contains a set of numbers used to determine the winner based on the numerical outcome of a professional sporting event.

Sec. 32. Minnesota Statutes 2010, section 349.13, is amended to read:

349.13 LAWFUL GAMBLING.

Lawful gambling is not a lottery or gambling within the meaning of sections 609.75 to 609.76 if it is conducted under this chapter. A pull-tab dispensing device, electronic bingo device, and electronic pull-tab device permitted under this chapter and by board rule is not a gambling device within the meaning of sections 609.75 to 609.76 and chapter 299L. An electronic game device allowed under this chapter may not be a slot machine. Electronic game devices, including but not limited to electronic bingo devices, electronic paddle wheels, and electronic pull-tab devices authorized under this chapter, may only be used in the conduct of lawful gambling permitted under this chapter and board rule

and may not display or simulate any other form of gambling or entertainment, except as otherwise allowed under this chapter.

Sec. 33. Minnesota Statutes 2010, section 349.151, subdivision 4b, is amended to read:

Subd. 4b. **Pull-tab sales from dispensing devices.** ~~(a)~~ The board may by rule authorize but not require the use of pull-tab dispensing devices.

~~(b) Rules adopted under paragraph (a):~~

~~(1) must limit the number of pull-tab dispensing devices on any permitted premises to three; and~~

~~(2) must limit the use of pull-tab dispensing devices to a permitted premises which is (i) a licensed premises for on-sales of intoxicating liquor or 3.2 percent malt beverages, or (ii) a premises where bingo is conducted and admission is restricted to persons 18 years or older.~~

~~(c) Notwithstanding rules adopted under paragraph (b), pull-tab dispensing devices may be used in establishments licensed for the off-sale of intoxicating liquor, other than drugstores and general food stores licensed under section 340A.405, subdivision 1.~~

Sec. 34. Minnesota Statutes 2010, section 349.151, subdivision 4c, is amended to read:

Subd. 4c. **Electronic bingo devices.** (a) The board may by rule authorize but not require the use of electronic bingo devices.

~~(b) Rules adopted under paragraph (a):~~

~~(1) must limit the number of bingo faces that can be played using an electronic bingo device to 36;~~

~~(2) must require that an electronic bingo device be used with corresponding bingo paper sheets or a facsimile, printed at the point of sale, as approved by the board;~~

~~(3) must require that the electronic bingo device site system have dial-up capability to permit the board to remotely monitor the operation of the device and the internal accounting systems; and~~

~~(4) must prohibit the price of a face played on an electronic bingo device from being less than the price of a face on a bingo paper sheet sold at the same occasion.~~

(b) The board, or the director if authorized by the board, may require the deactivation of an electronic bingo device for violation of a law or rule and to implement any other controls deemed necessary to ensure and maintain the integrity of electronic bingo devices and the electronic bingo games played on the devices.

Sec. 35. Minnesota Statutes 2010, section 349.151, is amended by adding a subdivision to read:

Subd. 4d. **Electronic pull-tab devices and electronic pull-tab game system.** (a) The board may adopt rules it deems necessary to ensure the integrity of electronic pull-tab devices, the electronic pull-tab games played on the devices, and the electronic pull-tab game system necessary to operate them.

(b) The board may not require an organization to use electronic pull-tab devices.

(c) Before authorizing the lease or sale of electronic pull-tab devices and the electronic pull-tab game system, the board shall examine electronic pull-tab devices allowed under section 349.12, subdivision 12b. The board may contract for the examination of the game system and electronic pull-tab devices and may require a working model to be transported to locations the board designates for testing, examination, and analysis. The manufacturer must pay all costs of any testing, examination, analysis, and transportation of the model. The system must be approved by the board before its use in the state and must have the capability to permit the board to electronically monitor its operation and internal accounting systems.

(d) The board may require a manufacturer to submit a certificate from an independent testing laboratory approved by the board to perform testing services, stating that the equipment has been tested, analyzed, and meets the standards required in this chapter and any applicable board rules.

(e) The board, or the director if authorized by the board, may require the deactivation of an electronic pull-tab device for violation of a law or rule and to implement any other controls deemed necessary to ensure and maintain the integrity of electronic pull-tab devices and the electronic pull-tab games played on the devices.

Sec. 36. Minnesota Statutes 2010, section 349.151, is amended by adding a subdivision to read:

Subd. 4e. **Sports-themed tipboard rules.** The board may adopt rules for the conduct of tipboards for which the winning numbers are determined in whole or in part by the numerical outcome of one or more professional sporting events. The rules must provide for operation procedures, internal control standards, posted information, records, and reports. The rules must provide for the award of prizes, method of payout, wagers, determination of winners, and the specifications of these tipboards.

Sec. 37. Minnesota Statutes 2010, section 349.155, subdivision 3, is amended to read:

Subd. 3. **Mandatory disqualifications.** (a) In the case of licenses for manufacturers, distributors, distributor salespersons, linked bingo game providers, and gambling managers, the board may not issue or renew a license under this chapter, and shall revoke a license under this chapter, if the applicant or licensee, or a director, officer, partner, governor, or person in a supervisory or management position of the applicant or licensee:

(1) has ever been convicted of a felony or a crime involving gambling;

(2) has ever been convicted of (i) assault, (ii) a criminal violation involving the use of a firearm, or (iii) making terroristic threats;

(3) is or has ever been connected with or engaged in an illegal business;

(4) owes $500 or more in delinquent taxes as defined in section 270C.72;

(5) had a sales and use tax permit revoked by the commissioner of revenue within the past two years; or

(6) after demand, has not filed tax returns required by the commissioner of revenue. The board may deny or refuse to renew a license under this chapter, and may revoke a license under this chapter, if any of the conditions in this paragraph are applicable to an affiliate or direct or indirect holder of more than a five percent financial interest in the applicant or licensee.

(b) In the case of licenses for organizations, the board may not issue a license under this chapter, and shall revoke a license under this chapter, if the organization, or an officer or member of the governing body of the organization:

(1) has been convicted of a felony or gross misdemeanor involving theft or fraud; or

(2) has ever been convicted of a crime involving gambling; or.

~~(3) has had a license issued by the board or director permanently revoked for violation of law or board rule.~~

Sec. 38. Minnesota Statutes 2010, section 349.155, subdivision 4, is amended to read:

Subd. 4. **License revocation, suspension, denial; censure.** (a) The board may by order (i) deny, suspend, revoke, or refuse to renew a license or premises permit, or (ii) censure a licensee or applicant, if it finds that the order is in the public interest and that the applicant or licensee, or a director, officer, partner, governor, person in a supervisory or management position of the applicant or licensee, an employee eligible to make sales on behalf of the applicant or licensee, or direct or indirect holder of more than a five percent financial interest in the applicant or licensee:

(1) has violated or failed to comply with any provision of this chapter or chapter 297E or 299L, or any rule adopted or order issued thereunder;

(2) has filed an application for a license that is incomplete in any material respect, or contains a statement that, in light of the circumstances under which it was made, is false, misleading, fraudulent, or a misrepresentation;

(3) has made a false statement in a document or report required to be submitted to the board or the commissioner of revenue, or has made a false statement to the board, the compliance review group, or the director;

(4) has been convicted of a crime in another jurisdiction that would be a felony if committed in Minnesota;

(5) is permanently or temporarily enjoined by any gambling regulatory agency from engaging in or continuing any conduct or practice involving any aspect of gambling;

(6) has had a gambling-related license revoked or suspended, or has paid or been required to pay a monetary penalty of $2,500 or more, by a gambling regulator in another state or jurisdiction;

(7) has been the subject of any of the following actions by the director of alcohol and gambling enforcement or commissioner of public safety: (i) had a license under chapter 299L denied, suspended, or revoked, (ii) been censured, reprimanded, has paid or been required to pay a monetary penalty or fine, or (iii) has been the subject of any other discipline by the director or commissioner;

(8) has engaged in conduct that is contrary to the public health, welfare, or safety, or to the integrity of gambling; or

(9) based on past activities or criminal record poses a threat to the public interest or to the effective regulation and control of gambling, or creates or enhances the dangers of unsuitable, unfair, or illegal practices, methods, and activities in the conduct of gambling or the carrying on of the business and financial arrangements incidental to the conduct of gambling.

(b) The revocation or suspension of an organization's license may not exceed a period of ten years, including any revocation or suspension imposed by the board prior to the effective date of this paragraph, except that:

(1) any prohibition placed by the board on who may be involved in the conduct, oversight, or management of the revoked organization's lawful gambling activity is permanent; and

(2) a revocation or suspension will remain in effect until any taxes, fees, and fines that are delinquent have been paid by the organization to the satisfaction of the board.

Sec. 39. Minnesota Statutes 2010, section 349.161, subdivision 1, is amended to read:

Subdivision 1. **Prohibited acts; licenses required.** (a) No person may:

(1) sell, offer for sale, or furnish gambling equipment for use within the state other than for lawful gambling exempt or excluded from licensing, except to an organization licensed for lawful gambling;

(2) sell, offer for sale, or furnish gambling equipment for use within the state without having obtained a distributor license or a distributor salesperson license under this section except that an organization authorized to conduct bingo by the board may loan bingo hard cards and devices for selecting bingo numbers to another organization authorized to conduct bingo and a linked bingo game provider may provide electronic bingo devices for linked electronic bingo games;

(3) sell, offer for sale, or furnish gambling equipment for use within the state that is not purchased or obtained from a manufacturer or distributor licensed under this chapter; or

(4) sell, offer for sale, or furnish gambling equipment for use within the state that has the same serial number as another item of gambling equipment of the same type sold or offered for sale or furnished for use in the state by that distributor.

(b) No licensed distributor salesperson may sell, offer for sale, or furnish gambling equipment for use within the state without being employed by a licensed distributor or owning a distributor license.

(c) No distributor or distributor salesperson may also be licensed as a linked bingo game provider under section 349.1635.

Sec. 40. Minnesota Statutes 2010, section 349.161, subdivision 5, is amended to read:

Subd. 5. **Prohibition.** (a) No distributor, distributor salesperson, or other employee of a distributor, may also be a wholesale distributor of alcoholic beverages or an employee of a wholesale distributor of alcoholic beverages.

(b) No distributor, distributor salesperson, or any representative, agent, affiliate, or other employee of a distributor, may: (1) be involved in the conduct of lawful gambling by an organization; (2) keep or assist in the keeping of an organization's financial records, accounts, and inventories; or (3) prepare or assist in the preparation of tax forms and other reporting forms required to be submitted to the state by an organization.

(c) No distributor, distributor salesperson, or any representative, agent, affiliate, or other employee of a distributor may provide a lessor of gambling premises any compensation, gift, gratuity, premium, or other thing of value.

(d) No distributor, distributor salesperson, or any representative, agent, affiliate, or other employee of a distributor may provide an employee or agent of the organization any compensation, gift, gratuity, premium, or other thing of value greater than $25 per organization in a calendar year.

(e) No distributor, distributor salesperson, or any representative, agent, affiliate, or other employee of a distributor may participate in any gambling activity at any gambling site or premises where gambling equipment purchased or leased from that distributor or distributor salesperson is being used in the conduct of lawful gambling.

(f) No distributor, distributor salesperson, or any representative, agent, affiliate, or other employee of a distributor may alter or modify any gambling equipment, except to add a "last ticket sold" prize sticker for a paper pull-tab game.

(g) No distributor, distributor salesperson, or any representative, agent, affiliate, or other employee of a distributor may: (1) recruit a person to become a gambling manager of an organization or identify to an organization a person as a candidate to become gambling manager for the organization; or (2) identify for an organization a potential gambling location.

(h) No distributor or distributor salesperson may purchase or lease gambling equipment for resale or lease to a person for use within the state from any person not licensed as a manufacturer under section 349.163, except for gambling equipment returned from an organization licensed under section 349.16, or exempt or excluded from licensing under section 349.166.

(i) No distributor or distributor salesperson may sell gambling equipment, except gambling equipment identified as a promotional ticket, to any person for use in Minnesota other than (i) a licensed organization or organization excluded or exempt from licensing, or (ii) the governing body of an Indian tribe.

(j) No distributor or distributor salesperson may sell or otherwise provide a paper pull-tab or tipboard deal with the symbol required by section 349.163, subdivision 5, paragraph (d), visible on the flare to any person other than in Minnesota to a licensed organization or organization exempt from licensing.

Sec. 41. Minnesota Statutes 2010, section 349.162, subdivision 5, is amended to read:

Subd. 5. **Sales from facilities.** (a) All gambling equipment purchased or possessed by a licensed distributor for resale or lease to any person for use in Minnesota must, prior to the equipment's resale or lease, be unloaded into a storage facility located in Minnesota which the distributor owns or leases; and which has been registered, in advance and in writing, with the Division of Alcohol and Gambling Enforcement as a storage facility of the distributor. All unregistered gambling equipment and all unaffixed registration stamps owned by, or in the possession of, a licensed distributor in the state of Minnesota shall be stored at a storage facility which has been registered with the Division of Alcohol and Gambling Enforcement. No gambling equipment may be moved from the facility unless the gambling equipment has been first registered with the board or the Department of Revenue. A distributor must notify the board of the method that it will use to sell and transfer electronic pull-tab games to licensed organizations, and must receive approval of the board before implementing or making changes to the approved method.

(b) Notwithstanding section 349.163, subdivisions 5, 6, and 8, a licensed manufacturer may ship into Minnesota approved or unapproved gambling equipment if the

licensed manufacturer ships the gambling equipment to a Minnesota storage facility that is: (1) owned or leased by the licensed manufacturer; and (2) registered, in advance and in writing, with the Division of Alcohol and Gambling Enforcement as a manufacturer's storage facility. No gambling equipment may be shipped into Minnesota to the manufacturer's registered storage facility unless the shipment of the gambling equipment is reported to the Department of Revenue in a manner prescribed by the department. No gambling equipment may be moved from the storage facility unless the gambling equipment is sold to a licensed distributor and is otherwise in conformity with this chapter, is shipped to an out-of-state site and the shipment is reported to the Department of Revenue in a manner prescribed by the department, or is otherwise sold and shipped as permitted by board rule. A manufacturer must notify the board of the method that it will use to sell and transfer electronic pull-tab games to licensed distributors, and must receive approval of the board before implementing or making changes to the approved method.

(c) All storage facilities owned, leased, used, or operated by a licensed distributor or manufacturer may be entered upon and inspected by the employees of the Division of Alcohol and Gambling Enforcement, the Division of Alcohol and Gambling Enforcement director's authorized representatives, employees of the Gambling Control Board or its authorized representatives, employees of the Department of Revenue, or authorized representatives of the director of the Division of Special Taxes of the Department of Revenue during reasonable and regular business hours. Obstruction of, or failure to permit, entry and inspection is cause for revocation or suspension of a manufacturer's or distributor's licenses and permits issued under this chapter.

(d) Unregistered gambling equipment found at any location in Minnesota other than the manufacturing plant of a licensed manufacturer or a registered storage facility are contraband under section 349.2125. This paragraph does not apply:

(1) to unregistered gambling equipment being transported in interstate commerce between locations outside this state, if the interstate shipment is verified by a bill of lading or other valid shipping document; and

(2) to gambling equipment registered with the Department of Revenue for distribution to the tribal casinos.

Sec. 42. Minnesota Statutes 2010, section 349.163, subdivision 1, is amended to read:

Subdivision 1. **License required.** No manufacturer of gambling equipment may sell any gambling equipment to any person for use or resale within the state, unless the manufacturer has a current and valid license issued by the board under this section and has satisfied other criteria prescribed by the board by rule. A manufacturer licensed under this section may also be licensed as a linked bingo game provider under section 349.1635.

A manufacturer licensed under this section may not also be directly or indirectly licensed as a distributor under section 349.161.

Sec. 43. Minnesota Statutes 2010, section 349.163, subdivision 5, is amended to read:

Subd. 5. **Paper pull-tab and tipboard flares.** (a) A manufacturer may not ship or cause to be shipped into this state or sell for use or resale in this state any deal of paper pull-tabs or tipboards that does not have its own individual flare as required for that deal by this subdivision and rule of the board. A person other than a manufacturer may not

manufacture, alter, modify, or otherwise change a flare for a deal of paper pull-tabs or tipboards except as allowed by this chapter or board rules.

(b) The flare of each paper pull-tab and tipboard game must have affixed to or imprinted at the bottom a bar code that provides all information required by the commissioner of revenue under section 297E.04, subdivision 2.

The serial number included in the bar code must be the same as the serial number of the tickets included in the deal. A manufacturer who manufactures a deal of paper pull-tabs must affix to the outside of the box containing that game the same bar code that is affixed to or imprinted at the bottom of a flare for that deal.

(c) No person may alter the bar code that appears on the outside of a box containing a deal of paper pull-tabs and tipboards. Possession of a box containing a deal of paper pull-tabs and tipboards that has a bar code different from the bar code of the deal inside the box is prima facie evidence that the possessor has altered the bar code on the box.

(d) The flare of each deal of paper pull-tabs and tipboards sold by a manufacturer for use or resale in Minnesota must have imprinted on it a symbol that is at least one inch high and one inch wide consisting of an outline of the geographic boundaries of Minnesota with the letters "MN" inside the outline. The flare must be placed inside the wrapping of the deal which the flare describes.

(e) Each paper pull-tab and tipboard flare must bear the following statement printed in letters large enough to be clearly legible:

"Pull-tab (or tipboard) purchasers – This pull-tab (or tipboard) game is not legal in Minnesota unless:

– an outline of Minnesota with letters "MN" inside it is imprinted on this sheet, and

– the serial number imprinted on the bar code at the bottom of this sheet is the same as the serial number on the pull-tab (or tipboard) ticket you have purchased."

(f) The flare of each paper pull-tab and tipboard game must have the serial number of the game imprinted on the bar code at the bottom of the flare in numerals at least one-half inch high.

Sec. 44. Minnesota Statutes 2010, section 349.163, subdivision 6, is amended to read:

Subd. 6. **Samples of gambling equipment.** (a) The board shall require each licensed manufacturer to submit to the board one or more samples of each item of gambling equipment ~~the manufacturer manufactures~~ manufactured for use or resale in this state. For purposes of this subdivision, a manufacturer is also required to submit the applicable version of any software necessary to operate electronic devices and related systems.

(b) The board shall inspect and test all the equipment, including software and software upgrades, it deems necessary to determine the equipment's compliance with law and board rules. Samples required under this subdivision must be approved by the board before the equipment being sampled is shipped into or sold for use or resale in this state. The board shall impose a fee of $25 for each item of gambling equipment that the manufacturer submits for approval or for which the manufacturer requests approval. The board shall impose a fee of $100 for each sample of gambling equipment that it tests.

(c) The board may require samples of gambling equipment to be tested by an independent testing laboratory prior to submission to the board for approval. All costs

of testing by an independent testing laboratory must be borne by the manufacturer. An independent testing laboratory used by a manufacturer to test samples of gambling equipment must be approved by the board before the equipment is submitted to the laboratory for testing.

(d) The board may request the assistance of the commissioner of public safety and the director of the State Lottery in performing the tests.

Sec. 45. Minnesota Statutes 2010, section 349.1635, subdivision 2, is amended to read:

Subd. 2. **License application.** The board may issue a license to a linked bingo game provider or to a manufacturer licensed under section 349.163 who meets the qualifications of this chapter and the rules promulgated by the board. The application shall be on a form prescribed by the board. The license is valid for two years and the fee for a linked bingo game provider license is $5,000 per year.

Sec. 46. Minnesota Statutes 2010, section 349.1635, subdivision 3, is amended to read:

Subd. 3. **Attachments to application.** An applicant for a linked bingo game provider license must attach to its application:

(1) evidence of a bond in the principal amount of $100,000 payable to the state of Minnesota conditioned on the payment of all linked bingo prizes and any other money due and payable under this chapter;

(2) detailed plans and specifications for the operation of the linked bingo game and the linked bingo system, along with a proposed fee schedule for the cost of providing services and equipment to licensed organizations which may not exceed 15 percent of gross profits, unless a higher percentage, not to exceed 20 percent, is authorized by the board. The fee schedule must incorporate costs paid to distributors for services provided under subdivision 5; and

(3) any other information required by the board by rule.

Sec. 47. Minnesota Statutes 2010, section 349.1635, is amended by adding a subdivision to read:

Subd. 5. **Linked bingo game services requirements.** (a) A linked bingo game provider must contract with licensed distributors for linked bingo game services including, but not limited to, the solicitation of agreements with licensed organizations, and installation, repair, or maintenance of the linked bingo game system.

(b) A distributor may not charge a fee to licensed organizations for services authorized and rendered under paragraph (a).

(c) A linked bingo game provider may not contract with any distributor on an exclusive basis.

(d) A linked bingo game provider may refuse to contract with a licensed distributor if the linked bingo game provider demonstrates that the licensed distributor is not capable of performing the services under the contract.

Sec. 48. Minnesota Statutes 2010, section 349.165, subdivision 2, is amended to read:

Subd. 2. **Contents of application.** An application for a premises permit must contain:

(1) the name and address of the applying organization;

(2) a description of the site for which the permit is sought, including its address and, where applicable, its placement within another premises or establishment;

(3) if the site is leased, the name and address of the lessor and information about the lease the board requires, including all rents and other charges for the use of the site. The lease term is concurrent with the term of the premises permit. The lease must contain a ~~30-day~~ termination clause. No lease is required for the conduct of a raffle; and

(4) other information the board deems necessary to carry out its purposes.

An organization holding a premises permit must notify the board in writing within ten days whenever any material change is made in the above information.

Sec. 49. Minnesota Statutes 2010, section 349.17, subdivision 6, is amended to read:

Subd. 6. **Conduct of bingo.** The price of a face played on an electronic bingo device may not be less than the price of a face on a bingo paper sheet sold for the same game at the same occasion. A game of bingo begins with the first letter and number called or displayed. Each player must cover, mark, or activate the numbers when bingo numbers are randomly selected~~;~~ and announced~~, and~~ or displayed to the players~~, either manually or with a flashboard and monitor~~. The game is won when a player, using bingo paper, bingo hard card, or a facsimile of a bingo paper sheet, has completed, as described in the bingo program, a previously designated pattern or previously determined requirements of the game and declared bingo. The game is completed when a winning card, sheet, or facsimile is verified and a prize awarded pursuant to subdivision 3.

Sec. 50. Minnesota Statutes 2010, section 349.17, subdivision 7, is amended to read:

Subd. 7. **Bar bingo.** An organization may conduct bar bingo subject to the following restrictions:

(1) the bingo is conducted at a site the organization owns or leases and which has a license for the sale of intoxicating beverages on the premises under chapter 340A; and

(2) the bingo is conducted using only bingo paper sheets or facsimiles of bingo paper sheets purchased from a licensed distributor or licensed linked bingo game provider~~; and~~.

~~(3) no rent may be paid for a bar bingo occasion.~~

Sec. 51. Minnesota Statutes 2010, section 349.17, subdivision 8, is amended to read:

Subd. 8. **Linked bingo games.** (a) A licensed organization may conduct or participate in ~~not more than two~~ linked bingo games ~~per occasion, one of which may be a~~, including progressive ~~game~~ games in which a portion of the prize is carried over from one ~~occasion~~ game to another until won by a player achieving a valid bingo ~~within a predetermined amount of bingo numbers called~~ based upon a predetermined and posted win determination.

(b) ~~Each participating licensed organization shall contribute to each prize awarded in a linked bingo game in an amount not to exceed $300.~~ Linked bingo games may only be conducted by licensed organizations who have a valid agreement with the linked bingo game provider.

(c) An electronic bingo device as defined in section 349.12, subdivision 12a, may be used for a linked bingo game.

(d) The board may adopt rules to:

(1) specify the manner in which a linked bingo game must be played and how the linked bingo prizes must be awarded;

(2) specify the records to be maintained by a linked bingo game provider;

(3) require the submission of periodic reports by the linked bingo game provider and specify the content of the reports;

(4) establish the qualifications required to be licensed as a linked bingo game provider; and

(5) any other matter involving the operation of a linked bingo game.

Sec. 52. Minnesota Statutes 2010, section 349.17, is amended by adding a subdivision to read:

Subd. 9. **Linked bingo games played exclusively on electronic bingo devices.** In addition to the requirements of subdivision 8, the following requirements and restrictions apply when linked bingo games are played exclusively on electronic bingo devices.

(a) The permitted premises must be:

(1) a premises licensed for the on-sale or off-sale of intoxicating liquor or 3.2 percent malt beverages, except for a general food store or drug store permitted to sell alcoholic beverages under section 340A.405, subdivision 1; or

(2) a premises where bingo is conducted as the primary business and has a seating capacity of at least 100.

(b) The number of electronic bingo devices is limited to:

(1) no more than six devices in play for permitted premises with 200 seats or less;

(2) no more than 12 devices in play for permitted premises with 201 seats or more; and

(3) no more than 50 devices in play for permitted premises where bingo is the primary business.

Seating capacity is determined as specified under the local fire code.

(c) Prior to a bingo occasion, the linked bingo game provider, on behalf of the participating organizations, must provide to the board a bingo program in a format prescribed by the board.

(d) Before participating in the play of a linked bingo game, a player must present and register a valid picture identification card that includes the player's address and date of birth.

(e) An organization may remove from play a device that a player has not maintained in an activated mode for a specified period of time determined by the organization. The organization must provide the notice in its house rules.

Sec. 53. Minnesota Statutes 2010, section 349.1711, subdivision 1, is amended to read:

Subdivision 1. **Sale of tickets.** (a) Tipboard games must be played using only tipboard tickets that are either (1) attached to a placard and arranged in columns or rows, or (2) separate from the placard and contained in a receptacle while the game is in play. The placard serves as the game flare.

(b) Except for a sports-themed tipboard, the placard must contain a seal that conceals the winning number or symbol. When a tipboard ticket is purchased and opened from a game containing more than 32 tickets, each player having a tipboard ticket with one or more predesignated numbers or symbols must sign the placard at the line indicated by the number or symbol on the tipboard ticket.

Sec. 54. Minnesota Statutes 2010, section 349.1711, subdivision 2, is amended to read:

Subd. 2. **Determination of winners.** When the predesignated numbers or symbols have all been purchased, or all of the tipboard tickets for that game have been sold, the seal must be removed to reveal a number or symbol that determines which of the predesignated numbers or symbols is the winning number or symbol. A tipboard may also contain consolation winners, or winning chances that are determined in whole or in part by the numerical outcome of one or more professional sporting events, that need not be determined by the use of the seal.

Sec. 55. Minnesota Statutes 2010, section 349.1721, is amended to read:

349.1721 CONDUCT OF PULL-TABS.

Subdivision 1. **Cumulative or carryover games.** The board shall by rule permit pull-tab games with multiple seals. The board shall also adopt rules for pull-tab games with cumulative or carryover prizes. The rules shall also apply to electronic pull-tab games.

Subd. 2. **Event games.** The board shall by rule permit pull-tab games in which certain winners are determined by the random selection of one or more bingo numbers or by another method approved by the board. The rules shall also apply to electronic pull-tab games.

Subd. 3. **Pull-tab dispensing device location restrictions and requirements.** The following pertain to pull-tab dispensing devices as defined under section 349.12, subdivision 32a.

(a) The use of any pull-tab dispensing device must be at a permitted premises which is:

(1) a licensed premises for on-sale of intoxicating liquor or 3.2 percent malt beverages;

(2) a premises where bingo is conducted as the primary business; or

(3) an establishment licensed for the off-sale of intoxicating liquor, other than drug stores and general food stores licensed under section 340A.405, subdivision 1.

(b) The number of pull-tab dispensing devices located at any permitted premises is limited to three.

Subd. 4. **Electronic pull-tab device requirements and restrictions.** The following pertain to the use of electronic pull-tab devices as defined under section 349.12, subdivision 12b.

(a) The use of any electronic pull-tab device may only be at a permitted premises that is:

(1) a premises licensed for the on-sale or off-sale of intoxicating liquor or 3.2 percent malt beverages, except for a general food store or drug store permitted to sell alcoholic beverages under section 340A.405, subdivision 1; or

(2) a premises where bingo is conducted as the primary business and has a seating capacity of at least 100; and

(3) where the licensed organization sells paper pull-tabs.

(b) The number of electronic pull-tab devices is limited to:

(1) no more than six devices in play at any permitted premises with 200 seats or less;

(2) no more than 12 devices in play at any permitted premises with 201 seats or more; and

(3) no more than 50 devices in play at any permitted premises where the primary business is bingo.

Seating capacity is determined as specified under the local fire code.

(c) The hours of operation for the devices are limited to 8:00 a.m. to 2:00 a.m.

(d) All electronic pull-tab games must be sold and played on the permitted premises and may not be linked to other permitted premises.

(e) Electronic pull-tab games may not be transferred electronically or otherwise to any other location by the licensed organization.

(f) Electronic pull-tab games may be commingled if the games are from the same family of games and manufacturer and contain the same game name, form number, type of game, ticket count, prize amounts, and prize denominations. Each commingled game must have a unique serial number.

(g) An organization may remove from play a device that a player has not maintained in an activated mode for a specified period of time determined by the organization. The organization must provide the notice in its house rules.

(h) Before participating in the play of an electronic pull-tab game, a player must present and register a valid picture identification card that includes the player's address and date of birth.

(i) Each player is limited to the use of one device at a time.

Subd. 5. **Multiple chance games.** The board may permit pull-tab games in which the holders of certain predesignated winning tickets, with a prize value not to exceed $75 each, have the option of turning in the winning tickets for the chance to win a prize of greater value.

Sec. 56. Minnesota Statutes 2010, section 349.18, subdivision 1, is amended to read:

Subdivision 1. **Lease or ownership required; rent limitations.** (a) An organization may conduct lawful gambling only on premises it owns or leases. Leases must be on a form prescribed by the board. The term of the lease is concurrent with the premises permit. Leases approved by the board must specify that the board may authorize an organization to withhold rent from a lessor for a period of up to 90 days if the board determines that

illegal gambling occurred on the premises or that the lessor or its employees participated in the illegal gambling or knew of the gambling and did not take prompt action to stop the gambling. The lease must authorize the continued tenancy of the organization without the payment of rent during the time period determined by the board under this paragraph. Copies of all leases must be made available to employees of the board and the Division of Alcohol and Gambling Enforcement on request.

(b) Rent paid by an organization for leased premises for the conduct of ~~pull-tabs, tipboards, and paddle wheels~~ lawful gambling is subject to the following limits and restrictions:

(1) For booth operations, ~~including booth operations where a pull-tab dispensing device is located, booth operations where a bar operation is also conducted, and booth operations where both a pull-tab dispensing device is located and a bar operation is also conducted, the maximum rent is:~~ monthly rent may not exceed ten percent of gross profits for that month. Total rent paid to a lessor from all organizations from leases governed by this clause may not exceed $1,750 per month.

~~(i) in any month where the organization's gross profit at those premises does not exceed $4,000, up to $400; and~~

~~(ii) in any month where the organization's gross profit at those premises exceeds $4,000, up to $400 plus not more than ten percent of the gross profit for that month in excess of $4,000;~~

(2) For bar operations, ~~including bar operations where a pull-tab dispensing device is located but not including bar operations subject to clause (1), and for locations where only a pull-tab dispensing device is located:~~ monthly rent may not exceed:

(i) 15 percent of the gross profits for that month from electronic pull-tab games and electronic linked bingo games; and

(ii) more than 20 percent of gross profits from all other forms of lawful gambling.

~~(i) in any month where the organization's gross profit at those premises does not exceed $1,000, up to $200; and~~

~~(ii) in any month where the organization's gross profit at those premises exceeds $1,000, up to $200 plus not more than 20 percent of the gross profit for that month in excess of $1,000;~~

(3) ~~a lease not governed by clauses (1) and (2) must be approved by the board before becoming effective;~~ For electronic linked bingo games and electronic pull-tab games that are operated for separate time periods within a business day by an organization and the lessor, monthly rent may not be more than:

(i) 15 percent of the gross profits for that month for the time periods operated by the lessor. The lessor is responsible for cash shortages that occur during the time periods the games are operated by the lessor; and

(ii) ten percent of gross profits for that month for the time periods operated by the organization. The organization is responsible for cash shortages that occur during the time periods the games are operated by the organization.

~~(4) total rent paid to a lessor from all organizations from leases governed by clause (1) may not exceed $1,750 per month.~~

~~(c) Rent paid by an organization for leased premises for the conduct of bingo is subject to either of the following limits at the option of the parties to the lease:~~

~~(1)~~ (4) For bingo conducted at a leased premises where the primary business is bingo, rent is limited to either not more than ten percent of the monthly gross profit from all lawful gambling activities held during bingo occasions, excluding bar bingo or at a rate based on a cost per square foot not to exceed 110 percent of a comparable cost per square foot for leased space as approved by the director~~, and~~.

~~(2)~~ (5) No rent may be paid for bar bingo as defined in section 349.12, subdivision 3c.

(6) A lease not governed by clauses (1) to (5) must be approved by the director before becoming effective.

~~(d)~~ (c) Amounts paid as rent under leases are all-inclusive. No other services or expenses provided or contracted by the lessor may be paid by the organization, including, but not limited to, trash removal, janitorial and cleaning services, snow removal, lawn services, electricity, heat, security, security monitoring, storage, and other utilities or services, ~~and, in the case of bar operations, cash shortages,~~ unless approved by the director. The lessor shall be responsible for the cost of any communications network or service required to conduct electronic pull-tab games or electronic bingo games. Any other expenditure made by an organization that is related to a leased premises must be approved by the director. For bar operations, the lessor is responsible for cash shortages. An organization may not provide any compensation or thing of value to a lessor or the lessor's employees from any fund source other than its gambling account. Rent payments may not be made to an individual.

~~(e)~~ (d) Notwithstanding paragraph (b), an organization may pay a lessor for food or beverages or meeting room rental if the charge made is comparable to similar charges made to other individuals or groups.

~~(f) No entity other than the~~ (e) A licensed organization may not conduct any activity ~~within a booth operation~~ on behalf of the lessor on a leased premises.

Sec. 57. Minnesota Statutes 2010, section 349.19, subdivision 2, is amended to read:

Subd. 2. **Accounts.** (a) Gross receipts from lawful gambling by each organization must be segregated from all other revenues of the conducting organization and placed in a separate gambling bank account.

(b) All expenditures for allowable expenses, taxes, and lawful purposes must be made from the separate account except (1) in the case of expenditures previously approved by the organization's membership for emergencies as defined by board rule, (2) as provided in subdivision 2a, or (3) when restricted to one electronic fund transaction for the payment of taxes for the organization as a whole, the organization may transfer the amount of taxes related to the conduct of gambling to the general account at the time when due and payable.

(c) The name and address of the bank, the account number for the separate account, and the names of organization members authorized as signatories on the separate account must be provided to the board when the application is submitted. Changes in the information must be submitted to the board at least ten days before the change is made.

(d) Except for gambling receipts from electronic pull-tab games and linked electronic bingo games, gambling receipts must be deposited into the gambling bank

account within four business days of completion of the bingo occasion, deal, or game from which they are received.

(1) A deal of paper pull-tabs is considered complete when either the last pull-tab of the deal is sold or the organization does not continue the play of the deal during the next scheduled period of time in which the organization will conduct pull-tabs.

(2) A tipboard game is considered complete when the seal on the game flare is uncovered or the organization does not continue the play of the deal during the next scheduled period of time in which the organization will conduct tipboards.

(e) Gambling receipts from all electronic pull-tab games and all linked electronic bingo games must be recorded on a daily basis and deposited into the gambling bank account within two business days.

~~(e)~~ (f) Deposit records must be sufficient to allow determination of deposits made from each bingo occasion, deal, or game at each permitted premises.

~~(f)~~ (g) The person who accounts for gambling gross receipts and profits may not be the same person who accounts for other revenues of the organization.

Sec. 58. Minnesota Statutes 2010, section 349.19, subdivision 3, is amended to read:

Subd. 3. **Expenditures.** (a) All expenditures of gross profits from lawful gambling must be itemized as to payee, purpose, amount, and date of payment.

(b) Each licensed organization must report monthly to the board ~~on a form~~ in an electronic format prescribed by the board each expenditure or contribution of net profits from lawful gambling. The reports must provide for each expenditure or contribution:

(1) the name of the recipient of the expenditure or contribution;

(2) the date the expenditure or contribution was approved by the organization;

(3) the date, amount, and check number or electronic transfer confirmation number of the expenditure or contribution;

(4) a brief description of how the expenditure or contribution meets one or more of the purposes in section 349.12, subdivision 25; and

(5) in the case of expenditures authorized under section 349.12, subdivision 25, paragraph (a), clause (7), whether the expenditure is for a facility or activity that primarily benefits male or female participants.

(c) Authorization of the expenditures must be recorded in the monthly meeting minutes of the licensed organization.

(d) Checks or authorizations for electronic fund transfers for expenditures of gross profits must be signed by at least two persons authorized by board rules to sign the checks or authorizations.

(e) Expenditures of gross profits from lawful gambling for local, state, and federal taxes as identified in section 349.12, subdivision 25, paragraph (a), clause (8), may be transferred electronically from the organization's gambling account directly to bank accounts identified by local, state, or federal agencies if the organization's gambling account monthly bank statement specifically identifies the payee by name, the amount transferred, and the date of the transaction.

(f) Expenditures of gross profits from lawful gambling for payments for lawful purpose expenditures and allowable expenses may be transferred electronically from the organization's gambling account directly to bank accounts identified by the vendor if the organization's gambling account monthly bank statement specifically identifies the payee by name, the amount transferred, the account number of the account into which the funds were transferred, and the date of the transaction.

(g) Expenditures of gross profits from lawful gambling for payroll compensation to an employee's account and for the payment of local, state, and federal withholding taxes may be transferred electronically to and from the account of a payroll processing firm provided that the firm:

(1) is currently registered with and meets the criteria of the Department of Revenue as a third-party bulk filer under section 290.92, subdivision 30;

(2) is able to provide proof of a third-party audit and an annual report and statement of financial condition;

(3) is able to provide evidence of a fidelity bond; and

(4) can provide proof of having been in business as a third-party bulk filer for the most recent three years.

(h) Electronic payments of taxes, lawful purpose expenditures, and allowable expenses are permitted only if they have been authorized by the membership, the organization maintains supporting documentation, and the expenditures can be verified.

EFFECTIVE DATE. This section is effective July 1, 2012.

Sec. 59. Minnesota Statutes 2010, section 349.19, subdivision 5, is amended to read:

Subd. 5. **Reports.** (a) A licensed organization must report monthly to the ~~Department of Revenue~~ board in an electronic format prescribed by the board and to its membership ~~monthly, or quarterly in the case of a licensed organization which does not report more than $1,000 in gross receipts from lawful gambling in any calendar quarter,~~ on its gross receipts, expenses, profits, and expenditure of profits from lawful gambling for each permitted premises. The organization must account for and report on each form of lawful gambling conducted. The ~~report~~ organization must include a reconciliation of the organization's profit carryover with its cash balance on hand. ~~If the organization conducts both bingo and other forms of lawful gambling, the figures for both must be reported separately.~~

(b) The organization must report ~~annually to its membership and annually file with the board a financial summary report in a format prescribed by the board that identifies the organization's receipts and use of lawful gambling proceeds, including:~~ monthly to the commissioner of revenue as required under section 297E.06.

~~(1) gross receipts;~~

~~(2) prizes paid;~~

~~(3) allowable expenses;~~

~~(4) lawful purpose expenditures, including annual totals for types of charitable contributions and all taxes and fees as per section 349.12, subdivision 25, paragraph (a), clauses (8) and (18);~~

~~(5) the percentage of annual gross profits used for charitable contributions, and~~

~~(6) the percentage of annual gross profits used for all taxes and fees as per section 349.12, subdivision 25, paragraph (a), clauses (8) and (18).~~

EFFECTIVE DATE. This section is effective July 1, 2012.

Sec. 60. Minnesota Statutes 2010, section 349.19, subdivision 10, is amended to read:

Subd. 10. **Pull-tab records.** (a) The board shall by rule require a licensed organization to require each winner of a paper pull-tab prize of $50 or more to present identification in the form of a driver's license, Minnesota identification card, or other identification the board deems sufficient to allow the identification and tracking of the winner. The rule must require the organization to retain winning paper pull-tabs of $50 or more, and the identification of the winner of the pull-tab, for 3-1/2 years.

(b) An organization must maintain separate cash banks for each deal of paper pull-tabs unless (1) the licensed organization uses a pull-tab dispensing device, or (2) the organization uses a cash register, of a type approved by the board, which records all sales of paper pull-tabs by separate deals.

(c) The board shall:

(1) by rule adopt minimum technical standards for cash registers that may be used by organizations, and shall approve for use by organizations any cash register that meets the standards; and

(2) before allowing an organization to use a cash register that commingles receipts from several different paper pull-tab games in play, adopt rules that define how cash registers may be used and that establish a procedure for organizations to reconcile all pull-tab games in play at the end of each month.

Sec. 61. Minnesota Statutes 2010, section 349.211, subdivision 1a, is amended to read:

Subd. 1a. **Linked bingo prizes.** Prizes for a linked bingo game shall be limited as follows:

(1) ~~no organization may contribute more than $300 per linked bingo game to a linked bingo prize pool~~ for linked bingo games played without electronic bingo devices, an organization may not contribute to a linked bingo game prize pool more than $300 per linked bingo game per site;

(2) for linked bingo games played exclusively with electronic bingo devices, an organization may not contribute more than 85 percent of the gross receipts per permitted premises to a linked bingo game prize pool;

~~(2)~~ (3) no organization may award more than $200 for a linked bingo game consolation prize. For purposes of this subdivision, a linked bingo game consolation prize is a prize awarded by an organization after a prize from the linked bingo prize pool has been won; ~~and~~

~~(3)~~ (4) for a progressive linked bingo game, if no player declares a valid bingo ~~within the~~ for a progressive prize or prizes based on a predetermined ~~amount of bingo numbers called~~ and posted win determination, a portion of the ~~prize is~~ gross receipts may be carried over to another ~~occasion~~ game until the accumulated progressive prize is won. The portion of the prize that is not carried over must be awarded to the first

player or players who declares a valid bingo as additional numbers are called. If a valid bingo is declared ~~within the predetermined amount of bingo numbers called~~, the entire prize pool for that game is awarded to the winner~~. The annual limit for progressive bingo game prizes contained in subdivision 2 must be reduced by the amount an organization contributes to progressive linked bingo games during the same calendar year.~~; and

(5) for linked bingo games played exclusively with electronic bingo devices, linked bingo prizes in excess of $599 shall be paid by the linked bingo game provider to the player within three business days. Winners of linked bingo prizes in excess of $599 will be given a receipt or claim voucher as proof of a win.

Sec. 62. Minnesota Statutes 2010, section 349.211, subdivision 2c, is amended to read:

Subd. 2c. **Tipboard prizes.** (a) The maximum prize which may be awarded for a tipboard ticket is $599 for $2 and under tipboard tickets, $899 for $3 tipboard tickets, $1,199 for $4 tipboard tickets, and $1,499 for $5 tipboard tickets, not including any cumulative or carryover prizes. Cumulative or carryover prizes in tipboard games shall not exceed $2,500. An organization may not sell any tipboard ticket for more than $5.

(b) For sports-themed tipboards, the total prize payout may not exceed the amount in section 349.2113, and each chance or ticket may not be sold for more than $10.

Sec. 63. **DEPARTMENT OF PUBLIC SAFETY; OVERSIGHT OF BACKGROUND CHECKS.**

The Department of Public Safety shall exercise oversight over all background checks on manufacturers and distributors who supply machines, games, software, or other gambling materials used in electronic pull-tabs, electronic bingo, or professional sports tipboards, to ensure the integrity of new forms of gambling entering the Minnesota market.

Sec. 64. **SEVERABILITY.**

If any provision of this act is found to be invalid because it is in conflict with a provision of the Minnesota Constitution or the Constitution of the United States, or for any other reason, all other provisions of this act shall remain valid and any rights, remedies, and privileges that have been otherwise accrued by this act, shall remain in effect and may be proceeded with and concluded under this act.

Sec. 65. **APPROPRIATION.**

(a) $1,219,000 in fiscal year 2013 is appropriated from the lawful gambling regulation account in the special revenue fund to the Gambling Control Board for operating expenses related to the regulatory oversight of lawful gambling for electronic pull-tabs and electronic linked bingo.

(b) $250,000 in fiscal year 2013 is appropriated from the lawful gambling regulation account in the special revenue fund to the Department of Public Safety for expenses related to the oversight of lawful gambling for electronic pull-tabs and electronic linked bingo.

Sec. 66. **REPEALER.**

Minnesota Statutes 2010, sections 297E.02, subdivision 4; 349.15, subdivision 3; and 349.19, subdivision 2a, are repealed.

EFFECTIVE DATE. This section is effective for games sold by a licensed distributor after June 30, 2012, and the commissioner of revenue retains the authority to issue refunds under Minnesota Statutes 2010, section 297E.02, subdivision 4, paragraph (d), for games sold before July 1, 2012.

Sec. 67. **EFFECTIVE DATE.**

Unless otherwise specifically provided, this act is effective the day following final enactment.

ARTICLE 5

MISCELLANEOUS

Section 1. **[245.981] COMPULSIVE GAMBLING ANNUAL REPORT.**

(a) Each year by February 15, 2014, and thereafter, the commissioner of human services shall report to the chairs and ranking minority members of the legislative committees having jurisdiction over compulsive gambling on the percentage of gambling revenues that come from gamblers identified as problem gamblers, or a similarly defined term, as defined by the National Council on Problem Gambling. The report must disaggregate the revenue by the various types of gambling, including, but not limited to: lottery; electronic and paper pull-tabs; bingo; linked bingo; and pari-mutuel betting.

(b) By February 15, 2013, the commissioner shall provide a preliminary update for the report required under paragraph (a) to the chairs and ranking minority members of the legislative committees having jurisdiction over compulsive gambling and the estimated cost of the full report.

Sec. 2. Minnesota Statutes 2010, section 297A.71, is amended by adding a subdivision to read:

Subd. 44. **Building materials, capital projects.** Materials and supplies used or consumed in and equipment incorporated into the construction or improvement of a capital project funded partially or wholly under section 297A.9905 are exempt, provided that the project has a total construction cost of at least $40,000,000 within a 24-month period. The tax on purchases exempt under this provision must be imposed and collected as if the rate under section 297A.62, subdivision 1, applied and then refunded in the manner provided in section 297A.75.

EFFECTIVE DATE. This section is effective for sales and purchases made after June 30, 2013.

Sec. 3. Minnesota Statutes 2011 Supplement, section 297A.75, subdivision 1, is amended to read:

Subdivision 1. **Tax collected.** The tax on the gross receipts from the sale of the following exempt items must be imposed and collected as if the sale were taxable and the rate under section 297A.62, subdivision 1, applied. The exempt items include:

(1) capital equipment exempt under section 297A.68, subdivision 5;

(2) building materials for an agricultural processing facility exempt under section 297A.71, subdivision 13;

(3) building materials for mineral production facilities exempt under section 297A.71, subdivision 14;

(4) building materials for correctional facilities under section 297A.71, subdivision 3;

(5) building materials used in a residence for disabled veterans exempt under section 297A.71, subdivision 11;

(6) elevators and building materials exempt under section 297A.71, subdivision 12;

(7) building materials for the Long Lake Conservation Center exempt under section 297A.71, subdivision 17;

(8) materials and supplies for qualified low-income housing under section 297A.71, subdivision 23;

(9) materials, supplies, and equipment for municipal electric utility facilities under section 297A.71, subdivision 35;

(10) equipment and materials used for the generation, transmission, and distribution of electrical energy and an aerial camera package exempt under section 297A.68, subdivision 37;

(11) tangible personal property and taxable services and construction materials, supplies, and equipment exempt under section 297A.68, subdivision 41;

(12) commuter rail vehicle and repair parts under section 297A.70, subdivision 3, clause (11);

(13) materials, supplies, and equipment for construction or improvement of projects and facilities under section 297A.71, subdivision 40;

(14) materials, supplies, and equipment for construction or improvement of a meat processing facility exempt under section 297A.71, subdivision 41;

(15) materials, supplies, and equipment for construction, improvement, or expansion of an aerospace defense manufacturing facility exempt under section 297A.71, subdivision 42; ~~and~~

(16) enterprise information technology equipment and computer software for use in a qualified data center exempt under section 297A.68, subdivision 42; and

(17) materials, supplies, and equipment for qualifying capital projects under section 297A.71, subdivision 34.

Sec. 4. Minnesota Statutes 2011 Supplement, section 297A.75, subdivision 2, is amended to read:

Subd. 2. **Refund; eligible persons.** Upon application on forms prescribed by the commissioner, a refund equal to the tax paid on the gross receipts of the exempt items must be paid to the applicant. Only the following persons may apply for the refund:

(1) for subdivision 1, clauses (1) to (3), the applicant must be the purchaser;

(2) for subdivision 1, clauses (4) and (7), the applicant must be the governmental subdivision;

(3) for subdivision 1, clause (5), the applicant must be the recipient of the benefits provided in United States Code, title 38, chapter 21;

(4) for subdivision 1, clause (6), the applicant must be the owner of the homestead property;

(5) for subdivision 1, clause (8), the owner of the qualified low-income housing project;

(6) for subdivision 1, clause (9), the applicant must be a municipal electric utility or a joint venture of municipal electric utilities;

(7) for subdivision 1, clauses (10), (11), (14), (15), and (16), the owner of the qualifying business; and

(8) for subdivision 1, clauses (12) ~~and~~, (13), and (17), the applicant must be the governmental entity that owns or contracts for the project or facility.

Sec. 5. Minnesota Statutes 2011 Supplement, section 297A.75, subdivision 3, is amended to read:

Subd. 3. **Application.** (a) The application must include sufficient information to permit the commissioner to verify the tax paid. If the tax was paid by a contractor, subcontractor, or builder, under subdivision 1, clause (4), (5), (6), (7), (8), (9), (10), (11), (12), (13), (14), (15), ~~or~~ (16), or (17), the contractor, subcontractor, or builder must furnish to the refund applicant a statement including the cost of the exempt items and the taxes paid on the items unless otherwise specifically provided by this subdivision. The provisions of sections 289A.40 and 289A.50 apply to refunds under this section.

(b) An applicant may not file more than two applications per calendar year for refunds for taxes paid on capital equipment exempt under section 297A.68, subdivision 5.

(c) Total refunds for purchases of items in section 297A.71, subdivision 40, must not exceed $5,000,000 in fiscal years 2010 and 2011. Applications for refunds for purchases of items in sections 297A.70, subdivision 3, paragraph (a), clause (11), and 297A.71, subdivision 40, must not be filed until after June 30, 2009.

EFFECTIVE DATE. This section is effective for sales and purchases made after June 30, 2013.

Sec. 6. **[297A.9905] USE OF LOCAL TAX REVENUES BY CITIES OF THE FIRST CLASS.**

(a) Notwithstanding section 297A.99, or other general or special law or charter provision, if the revenues from any local tax imposed on retail sales under special law by a city of the first class exceeds the amount needed to fund the uses authorized in the special law, the city may expend the excess revenue from the tax to fund other capital projects of regional significance.

(b) For purposes of this section:

(1) "city of the first class" has the meaning given in section 410.01; and

(2) "capital project of regional significance" means construction, expansion, or renovation of a sports facility or convention or civic center, that has a construction cost of at least $40,000,000.

EFFECTIVE DATE. This section is effective the day following final enactment.

Sec. 7. **[473J.27] USE OF THE STADIUM.**

Subdivision 1. **Amateur sports use.** The lessee of the stadium must make the facilities of the stadium available to the Minnesota Amateur Sports Commission up to ten days each year on terms satisfactory to the commission for amateur sports activities consistent with Minnesota Statutes, chapter 240A, each year during the time the bonds issued pursuant to this act are outstanding. The commission must negotiate in good faith and may be required to pay no more than actual out-of-pocket expenses for the time it uses the stadium.

Subd. 2. **High school league.** The lessee of the stadium must make the facilities of the stadium available for use by the Minnesota State High School League for at least seven days each year for high school soccer and football tournaments. The lessee of the stadium must provide, and may not charge the league a fee for, this use, including security, ticket takers, custodial or cleaning services, or other similar services in connection with this use.

ARTICLE 6

STADIUM BLINK-ON FUNDING

Section 1. **[16A.727] BACKUP REVENUES; FOOTBALL STADIUM FUNDING.**

(a) If the commissioner of management and budget determines that the amount of revenues under section 297E.021, subdivision 2, for the next fiscal year will be less than the amounts specified in section 297E.021, subdivision 3, paragraph (a), clause (1), items (i) to (iii), for that fiscal year, the commissioner may implement the revenue options authorized in this article; provided that this section does not constitute a pledge of tax revenues as security for the payment of principal and interest on appropriation bonds issued under section 16A.695. If the commissioner determines to exercise the authority under this section for a fiscal year, the commissioner must implement the revenue options, as necessary, in the following order:

(1) a sports-themed lottery game under section 349A.20; and

(2) a tax on suites as provided under section 473J.14.

(b) Revenue raised under the authority granted by this section must be deposited in the general fund.

(c) If the commissioner determines to implement one or more of the revenue options authorized by this section, each subsequent year the commissioner must determine if the revenue is needed and will be imposed and collected for the next fiscal year. If the commissioner determines that one or more revenue options implemented for a fiscal year are not needed for a subsequent fiscal year, the commissioner must terminate them in the reverse order they were required to be implemented by paragraph (a) with the last option implemented terminated first and so forth.

(d) Before implementing a revenue source authorized under this section, the commissioner must report the intent to do so to the Legislative Commission on Planning and Fiscal Policy. The commissioner must inform the commission of determinations to continue or discontinue each revenue source for a subsequent fiscal year.

(e) The provisions of this section no longer apply after the Minnesota Sports Facilities Authority certifies to the commissioner that it has determined that the revenues

of the general fund under section 297A.994, the increased revenues under chapter 297E, and other available resources of the authority provide adequate financial security for the state and the authority.

Sec. 2. **[349A.20] STADIUM, SPORTS-THEMED GAMES.**

The State Lottery shall conduct games based on stadium or professional sports themes to generate a minimum of $2,100,000 in additional revenue for the fiscal year for the general fund. Games issued under this section must comply with all NFL policies on use of trademarks, images, and logos.

EFFECTIVE DATE. This section is effective pursuant to the authority granted under section 1, on the day following final enactment.

Sec. 3. **[473J.14] SUITES TAX.**

(a) Upon notification by the commissioner of management and budget under section 16A.727, the authority shall by resolution impose and maintain a ten percent tax on the gross receipts received for the rental of suites, sky boxes, and similar in the NFL stadium.

(b) The tax must be imposed in the years specified by the commissioner of management and budget. The suites rental tax under paragraph (a) applies to the gross receipts, as defined under section 297A.61, received by the seller, as defined in section 297A.61, and is a debt owed by the seller to the authority. A tax imposed under this section is recoverable at law by the authority from the seller in the same manner as other debts. Every person granting, selling, or renting suites, sky boxes, or similar may be required, as provided in resolutions of the authority, to secure a permit, to file returns, to deposit security for the payment of the tax, and to pay the penalties for nonpayment and interest on late payments, as the authority deems necessary or expedient to assure the prompt and uniform collection of either or both of the taxes.

(c) The authority shall remit the proceeds of a tax imposed under this section to the commissioner of management and budget for deposit in the state's general fund.

Presented to the governor May 11, 2012

Signed by the governor May 14, 2012, 12:04 p.m.

Appendix B
Technical Reports

- Letter from AET to the Metropolitan Sports Facilities Commission Re: Groundwater Considerations for Metrodome Reconstruction (November 21, 2008)
- *Report of Preliminary Geotechnical Exploration and Review: Minnesota Multi-Purpose Stadium* (Report No. 01-05723) (AET, February 2013)
- *The EDR Radius Map Report with GeoCheck: The People's Stadium* (Inquiry Number: 03540142.1r) (EDR, March 2013)
  - Executive Summary, Overview Map, and Detail Map
  - Full report available upon request
- *Technical Memorandum of Environmental Review; Proposed Project Study Area for the People's Stadium* (AET, March 2013)

November 21, 2008

Metropolitan Sports Facilities Commission
900 South Fifth Street
Minneapolis, MN 55416

Attn: Mr. Steven C. Maki, PE

RE: Groundwater Considerations for Metrodome Reconstruction
Minneapolis, Minnesota
AET #01-04401

Dear Mr. Maki:

This letter presents a review of available ground water and geologic information in the vicinity of the Metrodome site and presents our opinions relating to establishment of the playing field elevation considering potential ground water impacts. The purpose is to assist your consultants preliminary planning and pricing of the potential project.

Background Information

The geologic profile at the site consists of fill, overlying both water-deposited and glacially deposited overburden soils down to the first contact with bedrock, which is dolomitic limestone of the Platteville Formation. The elevation of the top of the bedrock ranges from 792½ on the east side of the site to 794½ on the west side of the site. With the playing field being at elevation 795 feet-11 inches, the bedrock is then only about 1 to 3 feet below the on-grade slab. The soils between the slab and bedrock are predominantly granular (i.e., pervious materials).

Prior to Metrodome construction, a number of piezometers were installed within some of the pre-construction borings extending into the limestone bedrock. These piezometers measured water levels on the order of 5 feet to 7 feet beneath playing field elevation. During construction, a sump pit was constructed to a depth of about 8 feet in the limestone in the southeast corner of the field. The contractor experienced difficulty in lowering the water level in the rock to construct the sump due to the high and rapid inflow of water. The water level has continued to rise in the area with time. Near surface water has been somewhat controlled with pumps over the last number of years. In more recent years, the field became inundated near home plate, suggesting a hydrostatic water level near elevation 796 and the pumps not being able to keep up with the inflow of water. Small shallow wells drilled into the limestone have lowered the water sufficiently to keep the field dry at the present time.

AET has conducted soil borings on sites surrounding the Metrodome. A recent program immediately west of the Metrodome site (across the street) included borings extending to the limestone bedrock. These borings suggest the bedrock continues to rise to the west of the Metrodome site (elevation 794½ to 796). In addition, ground water levels were measured above the bedrock at elevations 797 and 798 at locations nearest to the Metrodome. Based on our review of the regional ground water condition, the data suggests there is a general gradient to the east, with the water generally migrating through more pervious soils and joints/weathered zones in the bedrock. Based on the data from the site across the street to the west, water levels may be in the vicinity of 1 to 2 feet above current playing field elevation. It is likely that the pumping currently occurring beneath the Metrodome slab locally draws down the water, and as is its function.

New Slab Elevation Considerations

The historical data indicates the water level has risen since the Metrodome preconstruction soil boring program in 1979. It is common for ground water levels to fluctuate. Rising of the ground water level in rock and slower draining materials can be more extreme, as there is little void space which needs to be filled to create saturation and the resulting water level rise.

Currently, water levels are within more permeable sands above the bedrock and, in some cases, above slow draining till layers just above the bedrock. This water may potentially continue to rise, although it is likely that it would not rise more than 4 feet above the current level (which was noted 2 feet above the current playing field just west of the site). Based on the current water level elevation noted to the west of the site, it is our opinion that a safe playing field elevation would be 6 feet above the current playing surface; corresponding to elevation 802 feet (4 feet above the noted level to the west).

It is our opinion the playing field can be placed at a lower elevation than 802 feet. However, in this case, it would be prudent to install an underfloor drainage system which can quickly collect and dispose of water through pumping in the event the water level does continue to rise. AET has designed underfloor drainage systems in the past, and a sample of such a system is included as Attachment A. This system involves the placement of a highly permeable drainage layer beneath the slab which includes perforated drain pipes to assist in collecting and diverting water to sump pumps. Depending on final floor elevation and the future ground water level fluctuations, there is a reasonable chance that water will not reach the underfloor drainage system. However, if the water level would ever rise, the system would be in place to allow for uniform collection beneath the slab and controlled removal of water. Once specifics of the project are known, a detailed design should be performed.

In association with the underfloor drainage system, we recommend several piezometers be installed beneath the slab to allow on-going water level checks. The actual pump system may

not be necessary, unless these checks suggest the water level is actually reaching the drainage system.

If you wish to place the slab at an elevation approaching the existing playing field or even as low as the current playing field, it would be possible to place the underfloor drainage system; although you should recognize this could result in significant pumping. It is possible to create a cut-off barrier around the perimeter of the field to seal off or at least significantly reduce water inflow which may rise up into the drainage layer zone. This could be in the form of below grade "clay dams", slurry walls, or structural walls extending to the bedrock. With this inflow control, an underfloor system and drain pipes is needed to collect seepage. However, with this perimeter control approach, pumping could be significantly reduced. This approach would be advantageous in the event there is contaminated ground water which flows to the area.

Closing

If you have any questions regarding the available data or our preliminary geotechnical opinions, please do not hesitate to contact us. As the project proceeds, AET remains very interested in providing geotechnical, environmental, materials and construction testing services for the project team.

Sincerely,

American Engineering Testing, Inc.

Jeffery K. Voyen

Jeffery K. Voyen, PE
Vice President, Geotechnical Division
(651) 659-1305
jvoyen@amengtest.com

Report Reviewed by:

American Engineering Testing, Inc.

Richard D. Stehly

Richard D. Stehly, PE, FACI
Principal
(651) 659-1333
rstehly@amengtest.com

JKV/DDS/ak

Attachment A – Typical Underfloor Drainage System Design

Attachment A – Typical Underfloor Drainage System Design

DEFINITIONS

Materials or items used for the system are as defined below:

- **Coarse Filter Material** – This material will require high permeability properties, and we recommend use of a No. 8 Coarse Aggregate material as defined in ASTM:C33-93 (Standard Specification for Concrete Aggregates). This material has the following gradation requirements:

Sieve Size or Number	Percentage Finer than (by weight)
½"	100%
⅜"	85%-100%
#4	10%-30%
#8	0-10%
#16	0-5%

- **Fine Filter Material** – A fine filter material can also be defined by ASTM:C33-93. The gradation for this material (fine aggregate) is as follows:

Sieve Size or Number	Percentage Finer than (by weight)
⅜"	100%
#4	95%-100%
#8	80%-100%
#16	50%-85%
#30	25%-60%
#50	10%-30%
#100	2%-10%

- **Geotextile Filter Fabric** – A filter fabric should meet the minimum requirements of a Type I fabric as defined in MnDOT Specification 3733.
- **Collector Drainage Pipe** – The collector pipes are intended to be the pipes which take in the water, and therefore should be perforated. Perforations should be limited to sizes not exceeding ¼ inch. PVC pipes are acceptable.
- **Header Pipe** – The pump system should be designed to efficiently collect and dispose of water up to a rate of at least 100 gpm. We anticipate flow rates will typically be considerably lower than this, so you may wish to consider a dual or multiple pump system wherein the primary pump handles a lower capacity, and a second larger pump is used for short-term overflow and backup purposes. The pumps should be controlled with a float-actuated switch to maintain the desired ground water level in the sump.

PERIMETER DRAINAGE SYSTEM

Although water will seep from below the slab area, much of the water entering the system at the time of pumping should enter the system from the perimeter (west side in this case). Therefore, we recommend a perimeter drainage system be placed immediately outside of the slab. It will not be possible to place an "exterior" system in those areas where the existing building is currently present.

Attachment A – Typical Underfloor Drainage System Design

We recommend a collector drainage line be placed along the perimeter, with a minimum diameter of 6 inches. The line should maintain a minimum slope of 4 inch of vertical drop over a 100 foot length to promote movement to the header pipe and pump. We recommend the perimeter collector pipe be connected to a header pipe for transport to the sump pump area for direct removal without impedance from the interior pipe system. Header pipes should have a minimum diameter of 6 inches.

The exterior collector pipes should be maintained at an elevation such that the top of the pipe is at least 6 inches or more below the bottom of proposed slab elevation. The pipe should be completely surrounded with coarse filter material which is at least 6 inches thick below the pipe and 9 inches thick to the sides and above the pipe. Because the coarse filter material includes significant void space, it will be necessary to protect the coarse filter material from piping or intrusion of the finer surrounding soils. This could be accomplished by enveloping the coarse filter material within a geotextile fabric. Because a fabric may potentially become clogged or have reduced effectiveness with time, you may wish to consider using a fine filter material as a transition layer between the coarse filter material and thesurrounding soils. In this case, we again recommend a minimum thickness of 6 inches below the coarse filter material and 9 inches (to 12 inches) to the sides and above the coarse filter material.

INTERIOR UNDERFLOOR DRAINAGE SYSTEM

Upward seepage may occur from below the slab; therefore, the interior floor slab should also be provided with a drainage system. Collector pipes can have a 4 inch diameter and should be placed with a minimum spacing of about 30 feet. We suggest the use of several parallel 6 inch header pipes spaced through the interior area. The collector pipes can then be placed perpendicular to the header pipes. It is possible that this placement of draintile lines may be impacted by the presence of other mechanical, electrical, or structural members; and the pipe layout design should consider these potential obstructions.

The pipes should be sloped a minimum of 4 inches of vertical drop per 100 feet of length. We recommend all interior drainage pipes be placed such that the top of the pipe is a minimum of 6 inches below the interior floor slab.

The drainage pipes should be placed within a coarse filter material. The coarse filter material should extend to a minimum depth of 6 inches below the drainage pipes and should be the sole material used in the pipe zone up to bottom of floor grade.

To accommodate 6 inches of cover, 6 inches of bedding, a 6 inch diameter header pipe and the needed slope/vertical drop, the coarse filter material layer will then need to be on the order of 2 foot thickor more.

A filter transition zone will be needed below the coarse aggregate to prevent erosion of underlying subgrade materials. This transition can be either a geotextile filter fabric or a 6 inch minimum thickness of fine filter material. Clogging of the filter fabric is not as much of a concern in this situation as compared to the exterior situation, and the use of fabric is likely the more feasible approach in this case.

PUMP COSIDERATIONS

The pump system will need to be capable of handling the ultimate capacity flowing from the system. This may require a series of pumps at different locations. You should consider the effects of a mechanical failure of the pump and the use of a backup pump system. The backup pump could be used as a secondary pumping system to handle shorter term high capacity needs. In addition, you should consider proving abackup electrical system in the event of a power failure.

AMERICAN
ENGINEERING
TESTING, INC.

CONSULTANTS
• ENVIRONMENTAL
• GEOTECHNICAL
• MATERIALS
• FORENSICS

REPORT OF PRELIMINARY GEOTECHNICAL EXPLORATION AND REVIEW

Minnesota Multi-Purpose Stadium

900 South 5th Street
Minneapolis, Minnesota

Report No. 01-05723

Date:

February 25, 2013

Prepared for:

Minnesota Sports Facilities Authority
900 South 5th Street
Minneapolis, MN 55415

www.amengtest.com

AMERICAN ENGINEERING TESTING, INC.

CONSULTANTS
• ENVIRONMENTAL
• GEOTECHNICAL
• MATERIALS
• FORENSICS

February 25, 2013

Minnesota Sports Facilities Authority
900 South 5th Street
Minneapolis, MN 55415

Attn: Steve Maki, PE

RE: Preliminary Geotechnical Exploration and Review
Minnesota Multi-Purpose Stadium
Minneapolis, Minnesota
Report No. 01-05723

Dear Mr. Maki:

American Engineering Testing, Inc. (AET) is pleased to present the results of our preliminary subsurface exploration program and geotechnical engineering review for the new Minnesota Multi-Purpose Stadium to be constructed at the existing Metrodome site in Minneapolis, Minnesota. The work was completed per our proposal dated February 5, 2013 and our subsequent service agreement.

In addition to the electronic copy, we are submitting two hard copies of the report to you. Additional copies are being sent on your behalf, as shown below.

Sincerely,
American Engineering Testing, Inc.

Jeffery K. Voyen

Jeffery K. Voyen, PE
Vice President/Principal Engineer
Phone: (651) 659-1305
Cell: (612) 961-9186
jvoyen@amengtest.com

Cc: (2) HKS, Attn: Kevin Taylor, AIA
(2) Thornton Tomasetti, Attn: Robert Treece, PE
(1) EVS, Inc., Attn: Richard Koppy, PE

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SIGNATURE PAGE

Prepared for:

Minnesota Sports Facilities Authority
900 South 5th Street
Minneapolis, Minnesota 55415
Attn: Steve Maki, PE

Prepared by:

American Engineering Testing, Inc.
550 Cleveland Avenue North
St. Paul, Minnesota 55114
(651) 659-9001/www.amengtest.com

Authored By:

Jeffery K. Voyen, PE
Vice President/Principal Engineer

Reviewed By:

Gregory R. Reuter, PE, PG
Principal Engineer

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under Minnesota Statute Section 326.02 to 326.15

Name: Jeffery K. Voyen

Date: 2/25/13 **License #: 15928**

TABLE OF CONTENTS

1.0 INTRODUCTION

A new Multi-Purpose Stadium is planned to be constructed at the existing Metrodome site in Minneapolis, Minnesota. To assist planning and design of the project, you have authorized American Engineering Testing, Inc. (AET) to conduct a subsurface exploration/testing program at the site, to conduct soil/rock laboratory testing, and to perform a preliminary geotechnical engineering review for the project. As the Metrodome will operate for another season, the geotechnical work will be conducted in phases, with the final phase performed during/after the current Metrodome demolition next winter. This report presents the results of the first phase on the geotechnical services and provides our associated preliminary engineering recommendations.

2.0 SCOPE OF SERVICES

The service scope was presented in the "Geotechnical Investigation Scope of Work" prepared by Thornton Tomasetti, dated January 16, 2013, and acknowledged by our February 5, 2013 proposal. Authorization to proceed with the stadium component of the services was formally received through the Project Services Agreement, dated February 11, 2013. The scope relative to the preliminary phase for the stadium consists of the following:

- Drill and sample eight standard penetration test (SPT) borings to the bedrock, following by rock coring into the underlying limestone bedrock.
- Perform geotechnical laboratory testing to evaluate soil and rock properties (water content, sieve analysis, and rock core compressive strength).
- Conduct geotechnical engineering analysis based on the gained data, and prepare this preliminary geotechnical engineering report.

These services were intended for geotechnical purposes. The scope was not intended to explore for the presence or extent of environmental contamination. During drilling, we did detect

contamination at Boring A8 by means of smell. Notes regarding this odor detection appear on the boring logs.

Also available for this review are the boring logs and tests from the pre-construction geotechnical report for the original Metrodome construction (conducted in 1978 and 1979) and from borings/temporary piezometers conducted by Braun Intertec in 2008. The logs from those reports have been included with this report in Appendix B.

3.0 PROJECT INFORMATION

The site is located on and adjacent to the existing Metrodome site in downtown Minneapolis, as shown on Figure 1. The new stadium will have an approximate footprint of 750 feet by 850 feet, located over the existing Metrodome footprint and in the current parking lot area to the east/southeast. Most of the new structure will be founded below the Event Level elevation of 797'-4½". This is slightly above the current Metrodome event level elevation of 795'-11", although much of the new Event Level will be cut into current grades outside of the Metrodome event level footprint. This new level will be roughly 35 feet to 50 feet below surrounding street grades, requiring a permanent retention system around the seating bowl area and temporary retention systems for service tunnel/below grade loading dock areas.

The structural frame will likely consist of a cast-in-place concrete seating bowl frame and a steel roof structure, with lateral loads resisted by concrete and/or structural steel framing. We understand the roof will incorporate the arch-truss scheme, which results in two highly loaded arch bearing points (located in the vicinity of recent Boring A3 and old Boring 9). Preliminary maximum column service loads are as follows:

- Arch bearing points – vertical: 14,000 kips dead and 20,600 kips total

- Arch bearing points – horizontal thrust: 8,000 kips dead and 12,000 kips total
- Seating bowl – vertical: 200 to 2,900 kips dead and 300 to 4,000 kips total
- Seating bowl (back of bowl with roof) – vertical: 5,200 kips dead and 7,500 kips total

The foundation level for the east arch bearing point is below the Event Level elevation. However, the foundation level for the west arch bearing point is higher, planned to be below the Main Concourse Level at elevation 852'-0".

We understand acceptable column/wall settlement to be ½ inch or less and acceptable stadium floor settlement of less than ¾ inch. We are assuming a minimum factor of safety of 3.0 with respect to localized shear or base failure of the foundation (whether spread footing or end bearing on a drilled pier).

New pavements are planned to be constructed, likely in the form of access drives. We assume access drives will need to accommodate heavier truck traffic. We are also providing pavement designs for light-duty traffic if "auto-only" parking areas will be constructed.

The stated information represents our current understanding of the proposed construction. This information is an integral part of our engineering review. It is important that you contact us if there are changes from that described so that we can evaluate whether modifications to our recommendations are appropriate.

4.0 SUBSURFACE EXPLORATION AND TESTING

4.1 Field Exploration Program

The subsurface exploration program conducted for this phase consisted of eight standard penetration test borings (A1 to A8) drilled to bedrock, followed by rock coring. The boring/core logs appear in Appendix A. The logs contain information concerning soil/rock layering, classification/material description, geologic description, and moisture condition. Relative density or consistency is also noted for the natural soils, which is based on the standard penetration resistance (N-value).

The boring locations appear graphically on Figure 1. The test locations were measured by AET using GPS (submeter accuracy, but not surveyor accuracy). The Hennepin County coordinates are shown on the boring logs. The boring surface elevations were measured by AET using an engineer's level and rod. The benchmarks used were the top rim of manholes which appear on the provided survey plans.

4.2 Laboratory Testing

During laboratory classification logging, water content tests were conducted on cohesive/organic soil samples. In addition, the test program included two sieve analysis tests and seven rock compressive strength tests. The test results appear on the individual boring logs. The full sieve analysis tests results are shown on the data sheet following the boring logs.

4.3 Historical Soil Boring Data

The original geotechnical report prepared in 1979 for the Metrodome project was available for our review. The report included numerous boring/rock coring logs, which we have included in Appendix B. It is important to note that site conditions have significantly changed (considerable

excavation in the Metrodome area and some filling in the east parking lot area) since those borings. Still, the logs offer good data on the elevation and condition of the deeper bedrock, which for the most part, should be relatively unchanged.

Borings were also drilled in the east parking lot area in 2008 by Braun Intertec. Two of the borings extended to the bedrock and temporary piezometers were installed. This data also appears in Appendix B.

5.0 SITE CONDITIONS

5.1 Subsurface Soils/Geology

The recent borings encountered 14 feet to 41½ feet of fill at the top of the profile. The fill is a typically silty sand, clayey sand, or sand with silt, with lesser amounts of sand and sandy lean clay. The fill includes gravel and appear to include cobbles and possibly boulders. Debris is sometimes present, such as pieces of concrete and, to a lesser degree, brick, glass, and wood. Based on N-values, the fill has variable compaction ranging from relatively high to moderately low.

The natural overburden geology includes both glacially-deposited till and water-deposited alluvium. The till includes silty sand, clayey sand, and sandy lean clay. The alluvium includes sand, sand with silt, and silty sand which often include significant gravel content. A significant portion of both the till and alluvium appears to include cobbles and likely boulders. Relatively large boulders were encountered during excavation for the original Metrodome.

In some areas, the zone just above the bedrock appears to have colluvial deposition (gravity-deposited pieces of bedrock and residual soils). Some of the colluvium appears to include

limestone slabs.

The approximate top of bedrock elevation at the recent boring locations ranges from elevation 790 feet to 795 feet. This is relatively consistent with the elevation range portrayed by the historical boring data. Figure 2 in Appendix B shows apparent top of bedrock elevation at the 1978/1979 boring locations.

The upper bedrock is limestone of the Platteville Formation. The Platteville can be subdivided into five members, although it appears the upper Carimona member is absent, leaving the fossiliferous Magnolia member as the upper zone of bedrock. The blocky and hard Magnolia member is underlain by the Hidden Falls member, which includes shaley beds and is more prone to weathering than the Magnolia. However, since the Hidden Falls member appears below elevation 783 feet, the Magnolia cap appears to have reasonably protected the Hidden Falls zone, as clay seams and shale weathering appears sufficiently low. The Hidden Falls is then underlain by competent Mifflin (below elevation 777 feet) and Pecatonica members. The Platteville Formation is underlain by Glenwood shale (about 4½ feet thick) and then St. Peter sandstone.

Six rock compressive strength tests have been conducted on limestone samples from the Magnolia member (three as a part of this program and three in 1979). The test results range from 10,240 psi to 19,550 psi, with an average of 12,600 psi. The average RQD of the upper zone is about 40%, although were as low as 20%.

5.2 Ground Water

Ground-water levels have risen in the area since the original Metrodome construction. Piezometers installed during the 1978/1979 geotechnical program found hydrostatic water levels

in the bedrock, below elevation 790 feet. The rise in the levels since then has necessitated considerable pumping efforts to control water levels below the current event level.

Review of the water levels measured in the recent soil borings suggests a hydrostatic ground-water level in the vicinity of elevation 796 feet to 798½ feet at the time of our exploration. The lower levels are is nearer to the Metrodome, and it is quite possible that water is being drawn down by the on-going pumping within the Metrodome. One of the temporary piezometers installed by Braun Intertec in 2008 indicates a water level as high as elevation 800.2 feet.

Ground-water levels should be expected to fluctuate with time due to varying seasonal and annual rainfall and snow melt amounts, as well as other factors. Ground-water levels measured at the time of our exploration may be low due to the fact that the borings were drilled in the winter during the time of reduced surface infiltration, and also the fact that the area is currently experiencing drought conditions. Ground-water levels could rise once precipitation patterns return to normal.

6.0 PRELIMINARY RECOMMENDATIONS

6.1 Spread Foundation Support

With foundations being placed below the Event Level elevation, they will be very near or into the Magnolia member of the limestone bedrock, pending location and foundation thickness. Foundations placed on the intact Magnolia member can be proportioned to exert an allowable bearing capacity of 25 tsf, but with additional penetration where needed, it should be feasible to increase this allowable bearing capacity to 50 tsf. The recent borings do indicate zones of the bedrock have reduced Rock Quality Designation (RQD) as compared to the borings associated with the original Metrodome program. The recent rock coring includes zone of rock with RQD

values in the 20% to 40% range, which limits capacity. To attain the 50 tsf allowable capacity, the bedrock should have an RQD of at least 40% within a vertical distance of 0.25B (B = footing width) of footing grade and an average RQD of 40% over a 1.0B distance of footing grade. Based on our review of the cores, which also considers RQD of partial runs, the excavation elevations shown on Table 6.1 are estimated for each boring/core location. Note that the actual depths will vary, as the rock excavation will break in blocks and along seams which may well differ from that shown at the test locations.

Table 6.1 – Estimated Depths/Elevations

Boring No.	For Allowable Bearing Capacity = 50 tsf	
	Depth (ft)	Elevation (ft)
A1	52.3	792.3
A2	46.4	786.8
A3	53.2	789.8
A4	54.6	787.8
A5	52.4	787.4
A6	48.8	793.8
A7	52.0	790.6
A8	51.2	790.9

The quality of the bedrock at each foundation should be evaluated in a probe hole within one footing width of foundation grade (1.0B). If rock quality criterion is not met, the area should be excavated further as needed to meet the criteria. This should include evaluating the intent of the above described RQD criteria. In addition, the bedrock beneath the bearing surface should not contain voids or soil filled fissures greater than ½-inch within one foundation width (1.0B).

6.2 Drilled Pier Foundation Support

Unless needed for lateral resistance reasons (such as at the arch bearing points), drilled piers will likely not be feasible as compared to spread footings. As the bedrock is at or near foundation grade, a drilled pier will not gain the advantage of skin friction (skin friction is not commonly added in the case of high end bearing piers). The pier would then have the same end bearing capabilities as the spread footing approach. Drilled shaft coring in fractured hard rock can be quite difficult, and the excavation approaches for spread footings will likely be preferred over drilled pier coring by the contractor. If higher drilled pier capacities are preferred, the piers would need to extend through the Hidden Falls member into the Mifflin member, where capacities of 100 tsf are often used.

6.3 Lateral Resistance

The arch bearing points are expected to be subjected to total thrust loads of up to 12,000 kips. The means of resisting these loads will be the subject of future supplemental correspondence and will be included in our final report. It is anticipated that we will conduct LPILE or GROUP analyses of the foundation options as the project develops.

6.4 Floor Slab/Ground Water Protection

Ground-water level measurements indicate water levels very near if not above the planned Event Level slab elevation. These measured levels may not even represent high ground-water level conditions. Accordingly, we recommend the installation of an underfloor drainage system which can adequately collect and dispose of water through pumping. The attached standard sheet entitled "Underfloor Drainage System Design Example" provides a potential design of this type of system, although modifications may be needed pending expected volume. This system

involves the placement of a highly permeable drainage layer beneath the slab which includes perforated drain pipes to assist in collecting and diverting water to sump pumps.

As the ground water migrates through relatively free-draining sands above the bedrock, it should be recognized that significant pumping flow rates are possible. It is possible to create a cut-off barrier around the perimeter of the Event Level to significantly reduce water inflow which may migrate into the drainage layer zone. This could be in the form of below grade "clay dams", slurry walls, or structural walls extending to the bedrock. With this inflow control, an underfloor system and drain pipes should still be provided to collect potential seepage, because seepage would still be expected through fractures and joints in the bedrock. However, with this perimeter control approach, we anticipate that pumping could be significantly reduced.

For other recommendations pertaining to moisture and vapor protection of interior floor slabs, we refer you to the attached standard sheet entitled "Floor Slab Moisture/Vapor Protection."

6.5 Retention Systems

Soldier pile/lagging and soil anchor tie-back earth retention systems are commonly used in the downtown Minneapolis area. This system can be used, but can be prone to sloughing and poor settlement control, and may be complicated by the cobbles and boulders which may be encountered. An alternate system having better settlement control may be a soil nail shotcrete earth retention system, wherein the wall is incrementally built from top down using shotcrete, steel reinforcement, and soil nails/tiebacks which can be in the form of helical pile anchors or grouted tiebacks. Where soils are prone to sloughing, shotcrete can be applied as an initial step to control the ground movement.

Diaphragm/slurry walls or a grouting procedure (such as jet grouting) may be a consideration, although construction may be complicated by cobbles/boulders and in-place utilities. The benefit of the reinforced shotcrete approach is that the areas worked are visible and obstacles can be openly dealt with or worked around.

The base of the wall construction will be complicated by the presence of the ground-water level. An option may be to use grouting or slurry wall construction procedures at the base of the wall once the excavation reaches an elevation just above the ground-water level. This method can then be designed and constructed to assist in "cutting off" the perimeter for ground-water reduction control as discussed in the prior section.

Retention systems are typically designed by engineers of the specialty contractors (based on performance-based specifications).

Assuming the retention system will be designed and constructed to maintain its integrity on a permanent basis, and the interior wall is built separately from this system, a narrow backfill zone would exist. Presuming water control will be needed, a gravel bed/drainage pipe system can be placed at the base, with free draining sand fill or a geosynthetic drainage board placed above this. All open-graded gravel materials should be separated from finer materials with a geotextile separation fabric to prevent internal erosion of fines into the gravel void space. It may be difficult to compact backfill due to space limitations, and alternate materials or methods may be needed to prevent surface subsidence (or a structural bridge could be created at the surface such that subsidence is not an issue).

For general backfilling of basement or imbalanced fill loads on walls, we refer you to the

attached sheet entitled "Basement/Retaining Wall Backfill and Water Control." This sheet also presents recommended lateral pressure estimates for design.

6.6 Pavements/Exterior Slabs

6.6.1 Definitions

The ensuing section uses italicized words, which have the following definitions:

Top of grading grade is defined as the grade which contacts the bottom of the aggregate base layer.

Sand subbase is a uniform thickness sand layer placed as the top of subgrade (directly below top of grading grade) which is intended to improve the frost and drainage characteristics of the pavement system by better draining excess water in the aggregate base and subbase, by reducing and "bridging" frost heaving, and by reducing spring thaw weakening effects.

Critical subgrade zone is the subgrade portion beneath and within three vertical feet of the *top of grading grade* (which can be reduced to 2½ feet for light-duty pavements). A *sand subbase*, if placed, would be considered the upper portion of the critical subgrade zone.

Select Granular Material shall meet the requirements of Mn/DOT Specification 3149.2B2.

Test roll is a means of evaluating the near-surface stability of subgrade soils (usually non-granular). Suitability is determined by the depth of rutting or deflection caused by passage of heavy rubber-tired construction equipment, such as a loaded dump truck, over the test area. Yielding of less than 1-inch is normally considered acceptable, although engineering judgment may be applied depending on equipment used, soil conditions present, and/or pavement performance expectations.

Unstable soils are those soils which do not pass a *test roll*. Unstable soils typically have water content exceeding the *standard optimum water content* defined in ASTM:D698 (Standard Proctor test).

Organic soils are those soils which have sufficient organic content such that engineering properties/stability are affected (assumed to be 3% or more organic content in this report). These soils are usually black to dark brown in color.

6.6.2 Recycling of On-site Materials

The on-site concrete and bituminous materials can be recycled if they are crushed to an aggregate base-like gradation specification. Crushed bituminous, to be reused as aggregate base, should be blended with mineral soils/gravel or crushed concrete to meet Mn/DOT Class 7 Specification 3138.2A2.

6.6.3 Subgrade Preparation

Many of the on-site soils present in potential subgrade areas are silty sands and clayey sands, with occasional inclusions of clays. These soils are frost susceptible and can have limited drainage characteristics. In these soil types, it is desired to place a *sand subbase* layer of *Select Granular Material* directly below the aggregate base layer to better reduce periods of aggregate and upper subgrade saturation and the associated frost movements and thaw weakening effects. In areas where these more silty and clayey soils are present, we recommend a 1-foot thick *sand subbase* layer of *Select Granular Material* be placed.

There may be areas where the subgrade soils already meet a *Select Granular Material* specification (soils classified as sand or sand with silt). In this case, the incorporation of a *sand subbase* would not be necessary.

Where a *sand subbase* is placed and there is a need to vary the thickness of the subbase, we recommend the thickness have a taper of no steeper than 10:1 (H:V). To the outside of paved or

slab areas, the subcut and *sand subbase* placement should extend slightly beyond the outer edge of the curb/slab edge to maintain frost uniformity. The *sand subbase* should be provided with a positive means of subsurface drainage. Where the pavement slopes, subsurface water will migrate upon the underlying slow draining soils through the *sand subbase* layer to the lower elevation points. If sufficient granular soils underlie the *sand subbase*, infiltration will occur. However, where the subbase is underlain by soils with poor infiltration properties, the design should include a means of drainage at the low elevation points, such as placing an engineered perforated drain pipe which daylights to storm sewers. In more level areas, periodically spaced drainage lines should be created.

The final subgrade should have proper stability within the *critical subgrade zone*. Granular soils should be surface compacted. In more clayey/silty areas, the stability of the soils exposed prior to *sand subbase* placement should be evaluated using the *test roll* procedure. Instability will likely be a result of wetter clayey soils. More widespread instability can be anticipated during wetter seasons. *Unstable soils* should either be subcut and replaced, or reworked in-place. If soils are reworked in-place, they may need to undergo considerable scarification and drying to reach a proper level of stability (ability to pass a *test roll*). Reworked soils should be prepared similar to new fill materials, and should meet the water content and compaction requirements outlined later for new fill placement. We caution that instability of soils present beneath the soils being reworked and compacted may limit the ability to compact the upper soils. In this case, greater depths of subcutting and stability improvement may be needed.

If *organic soils* or debris-laden soils (to the point of creating void space) are found to be present, we recommend removing these materials where present within the *critical subgrade zone*.

Following the above recommended excavations and preparation of existing soils, fill can be placed as needed to attain subgrade elevation. Fill should be placed and compacted per the requirements of Mn/DOT Specification 2105.3F1 (Specified Density Method). Using ASTM terminology, this specification requires soils placed within the *critical subgrade zone* be compacted to a minimum of 100% of the *standard maximum dry unit weight* defined in ASTM: D698 (Standard Proctor test), at a water content from 65% to 102% of the *standard optimum water content*. A reduced minimum compaction level of 95% of the standard maximum dry unit weight can be used below the *critical subgrade zone*. A *sand subbase* can be considered part of a composite subgrade; and the top of the subbase can be figured as the top of the 3-foot subgrade zone needing the 100% compaction level. However, the lower (dry) end of the water content range requirement does not need to apply to the sands.

6.6.4 Pavement Designs

We are presenting pavement designs based on two potential traffic situations (light-duty and heavy-duty). The light-duty design refers to pavements which are intended for automobiles and passenger truck/vans. The heavy-duty design is intended for pavements which will experience truck traffic.

Based on the clayey soils encountered and the recommended subgrade preparation (with a 1-foot *sand subbase* if *Select Granular Material* is not already in-place), we estimate an R-value of 30 or a k-value of 200 pci is appropriate for the pavement design. Based on these parameters and the assumed traffic, our recommended minimum design sections appear in the following tables.

Table 6.6.4a – Bituminous Pavement Thickness Designs

Material	Section Thicknesses (R=30)	
	Light Duty	Heavy Duty
Bituminous Wear	3" (2 lifts)	4.5" (2 lifts)
Class 5, 6 or 7 Aggregate Base	5"	6"

Table 6.6.4b – Concrete Pavement Thickness Designs

Material	Section Thicknesses (k=200 pci)	
	Light Duty	Heavy Duty
Concrete	3.5"	5.5"
Class 5, 6 or 7 Aggregate Base	4"	4"

The concrete design assumes that no dowels are needed for load transfer. Although the aggregate base layer is not necessarily needed for strength reasons, it was added to the concrete design to assist in controlling "mud pumping" at the joints. The design assumes a minimum concrete compressive strength (f'_c) of 4000 psi at 28 days.

The presented designs have been based on "20-year" pavement life design charts. However, the concrete design is expected to have a longer pavement life; or at least, does not require the on-going maintenance of a bituminous system. The benefit of a bituminous system is that rehabilitation techniques, such as mill and overlay procedures, can be more easily performed.

7.0 CONSTRUCTION CONSIDERATIONS

7.1 Excavation Backsloping

Where excavation faces are not retained, the excavations should maintain maximum allowable slopes in accordance with *OSHA Regulations (Standards 29 CFR), Part 1926, Subpart P,*

"Excavations" (can be found on www.osha.gov). Even with the required OSHA sloping, water seepage or surface runoff can potentially induce side-slope erosion or running which could require slope maintenance. The responsibility for excavation face maintenance in accordance with OSHA requirements should lie with the contractor, and we recommend the construction documents be prepared as such.

7.2 Observation and Testing

The recommendations in this report are based on the subsurface conditions found at our test boring/core locations. Since the conditions are expected to vary away from the test locations, we recommend on-site observation by a representative of the geotechnical engineer-of-record during construction to evaluate these potential changes.

At each rock-bearing foundation, a 1½ inch minimum diameter probe hole should be drilled by the contractor in the presence of the geotechnical representative which extends to a depth of at least one foundation width below bottom of the foundation (whether spread footing or drilled pier). The probe hole should be evaluated for the presence of open seams or clay-filled seams using a feeler rod. Where the bedrock is found deficient, additional penetration into the rock should be performed as directed by the geotechnical representative.

Soil density and Proctor testing should be performed on new fill placed in order to document that project specifications for compaction have been satisfied. Sieve analysis tests should be conducted on soil and gravel/aggregate materials as needed to evaluate compliance with the project material specifications.

7.3 Construction Impacts on Surrounding Property

Protection of surrounding property will be an important consideration. Where construction is expected to generate vibrations, we recommend conducting pre-construction and post-construction condition surveys of the nearby structures. Vibration monitoring is also recommended during construction, depending on structure proximity and sensitivity, and on the construction methods used.

7.4 Other Potential Construction Difficulties

7.4.1 Rock Excavation

Pending final grades and foundation thicknesses, some excavation may be needed into the bedrock. Excavation into the harder intact limestone will likely require hard rock excavation techniques such as rock chipping, possibly requiring line drilling in advance of the chipping.

7.4.2 Cobbles, Boulders, and Debris

The soils at this site will include significant cobbles and probably boulders. Debris and buried slabs may also be encountered. These larger particles will make construction procedures somewhat more difficult than normal where they are encountered. They may also require the need for tieback or anchor design revisions to retention systems if they obstruct penetration during construction.

7.4.3 Water in Excavations

Ground water will likely be encountered in many of the excavations. To allow observation of excavation bottoms and to facilitate construction operations, we recommend water be removed from within the excavations during construction.

7.4.4 Disturbance of Soils

The on-site soils can become disturbed under construction traffic, especially if finer grained soils are wet. If soils become disturbed, they should be subcut to the underlying undisturbed soils. The subcut soils can then be dried and recompacted back into place, or they should be removed and replaced with drier imported fill.

7.4.5 Wet or Dry Soils

Some of the site soils available for re-use may be wet or could become wet of the "optimum water content" condition; or they may be too dry. Such soils may then need to be moisture conditioned in order to achieve specified compaction levels.

8.0 LIMITATIONS

Within the limitations of scope, budget, and schedule, our services have been conducted according to generally accepted geotechnical engineering practices at this time and location. Other than this, no warranty, either express or implied, is intended.

Important information regarding risk management and proper use of this report is given in Appendix C entitled "Geotechnical Report Limitations and Guidelines for Use."

DEFINITIONS

Materials or items used for the system are as defined below.

- **Coarse Filter Material** – This material will require high permeability properties, and we recommend use of a No. 8 Coarse Aggregate material as defined in ASTM:C33-93 (Standard Specification for Concrete Aggregates). This material has the following gradation requirements:

Sieve Size or Number	Percentage Finer than (by weight)
½"	100%
¾ "	85%-100%
#4	10%-30%
#8	0-10%
#16	0-5%

- **Fine Filter Material** – A fine filter material can also be defined by ASTM:C33-93. The gradation for this material (fine aggregate) is as follows:

Sieve Size or Number	Percentage Finer than (by weight)
⅜"	100%
#4	95%-100%
#8	80%-100%
#16	50%-85%
#30	25%-60%
#50	10%-30%
#100	2%-10%

- **Geotextile Filter Fabric** – A filter fabric should meet the minimum requirements of a Type I fabric as defined in Mn/DOT Specification 3733.
- **Collector Drainage Pipe** – The collector pipes are intended to be the pipes which take in the water, and therefore should be perforated. Perforations should be limited to sizes not exceeding ¼ inch. PVC pipes are acceptable.
- **Header Pipe -** The pump system should be designed to efficiently collect and dispose of water up to a rate of at least 100 gpm. We anticipate flow rates will typically be considerably lower than this, so you may wish consider a dual or multiple pump system wherein the primary pump handles a lower capacity, and a second larger pump is used for short-term overflow and backup purposes. The pumps should be controlled with a float-actuated switches to maintain the desired ground water level in the sump.

PERIMETER DRAINAGE SYSTEM

Although water will seep from below the slab area, much of the water entering the system at the time of pumping should enter the system from the perimeter. Therefore, we recommend a perimeter drainage system be placed immediately outside of the slab area (i.e., exterior side of perimeter wall).

We recommend a collector drainage line be placed along the perimeter, with a minimum diameter of 6 inches. The line should maintain a minimum slope of 4 inch of vertical drop over a 100 foot length to promote movement to the header pipe and pump. We recommend the perimeter collector pipe be connected to a header pipe for transport to the sump pump area for direct removal without impedance from the interior pipe system. Header pipes should have a minimum diameter of 6 inches.

The exterior collector pipes should be maintained at an elevation such that the top of the pipe is at least 6 inches or more below the bottom of proposed slab elevation. The pipe should be completely surrounded with coarse filter material which is at least 6 inches thick below the pipe and 9 inches thick to the sides and above the pipe. Because the coarse filter material includes significant void space, it will be necessary to protect the coarse filter material from piping or intrusion of the finer surrounding soils. This could be accomplished by enveloping the coarse filter material within a geotextile fabric. Because a fabric may potentially become clogged or have reduced effectiveness with time, you may wish to consider using a fine filter material as a transition layer between the coarse filter material and the surrounding soils. In this case, we again recommend a minimum thickness of 6 inches below the coarse filter material and 9 inches (to 12 inches) to the sides and above the coarse filter material.

INTERIOR UNDERFLOOR DRAINAGE SYSTEM

Upward seepage may occur from below the slab; therefore, the interior floor slab should also be provided with a drainage system. Collector pipes can have a 4 inch diameter and should be placed with a minimum spacing of about 30 feet. We suggest the use of parallel 6 inch header pipes spaced through the interior area. The collector pipes can then be placed perpendicular to the header pipes. It is possible that this placement of draintile lines may be impacted by the presence of other mechanical, electrical, or structural members; and the pipe layout design should consider these potential obstructions.

The pipes should be sloped a minimum of 4 inches of vertical drop per 100 feet of length. We recommend all interior drainage pipes be placed such that the top of the pipe is a minimum of 6 inches below the interior floor slab.

The drainage pipes should be placed within a coarse filter material. The coarse filter material should extend to a minimum depth of 6 inches below the drainage pipes and should be the sole material used in the pipe zone up to bottom of floor grade.

To accommodate 6 inches of cover, 6 inches of bedding, a 6 inch diameter header pipe and the needed slope/vertical drop, the coarse filter material layer will then need to be on the order of 2 foot thick or more.

A filter transition zone will be needed below the coarse aggregate to prevent erosion of underlying subgrade materials. This transition can be either a geotextile fabric or a 6 inch minimum thickness of fine filter material. Clogging of the filter fabric is not as much of a concern in this situation as compared to the exterior situation, and the use of a fabric is likely the more feasible approach in this case.

PUMP CONSIDERATIONS

The pump system will need to be capable of handling the ultimate capacity flowing from the system. This may require a series of pumps at different locations. You should consider the effects of a mechanical failure of the pump and the use of a backup pump system. The backup pump could be used as a secondary pumping system to handle shorter term high capacity needs. In addition, you should consider proving a backup electrical system in the event of a power failure.

FLOOR SLAB MOISTURE/VAPOR PROTECTION

Floor slab design relative to moisture/vapor protection should consider the type and location of two elements, a granular layer and a vapor membrane (vapor retarder, water resistant barrier or vapor barrier). In the following sections, the pros and cons of the possible options regarding these elements will be presented, such that you and your specifier can make an engineering decision based on the benefits and costs of the choices.

GRANULAR LAYER

In American Concrete Institute (ACI) 302.1R-04, a "base material" is recommended over the vapor membrane, rather than the conventional clean "sand cushion" material. The base layer should be a minimum of 4 inches (100 mm) thick, trimmable, compactible, granular fill (not sand), a so-called crusher-run material. Usually graded from 1½ inches to 2 inches (38 to 50 mm) down to rock dust is suitable. Following compaction, the surface can be choked off with a fine-grade material. We refer you to ACI 302.1R-04 for additional details regarding the requirements for the base material.

In cases where potential static water levels or significant perched water sources appear near or above the floor slab, an under floor drainage system may be needed wherein a draintile system is placed within a thicker clean sand or gravel layer. Such a system should be properly engineered depending on subgrade soil types and rate/head of water inflow.

VAPOR MEMBRANE

The need for a vapor membrane depends on whether the floor slab will have a vapor sensitive covering, will have vapor sensitive items stored on the slab, or if the space above the slab will be a humidity controlled area. If the project does not have this vapor sensitivity or moisture control need, placement of a vapor membrane may not be necessary. Your decision will then relate to whether to use the ACI base material or a conventional sand cushion layer. However, if any of the above sensitivity issues apply, placement of a vapor membrane is recommended. Some floor covering systems (adhesives and flooring materials) require installation of a vapor membrane to limit the slab moisture content as a condition of their warranty.

VAPOR MEMBRANE/GRANULAR LAYER PLACEMENT

A number of issues should be considered when deciding whether to place the vapor membrane above or below the granular layer. The benefits of placing the slab on a granular layer, with the vapor membrane placed **below** the granular layer, include **reduction** of the following:

- Slab curling during the curing and drying process.
- Time of bleeding, which allows for quicker finishing.
- Vapor membrane puncturing.
- Surface blistering or delamination caused by an extended bleeding period.
- Cracking caused by plastic or drying shrinkage.

The benefits of placing the vapor membrane **over** the granular layer include the following:

- A lower moisture emission rate is achieved faster.
- Eliminates a potential water reservoir within the granular layer above the membrane.
- Provides a "slip surface", thereby reducing slab restraint and the associated random cracking.

If a membrane is to be used in conjunction with a granular layer, the approach recommended depends on slab usage and the construction schedule. The vapor membrane should be placed above the granular layer when:

- Vapor sensitive floor covering systems are used or vapor sensitive items will be directly placed on the slab.
- The area will be humidity controlled, but the slab will be placed before the building is enclosed and sealed from rain.
- Required by a floor covering manufacturer's system warranty.

The vapor membrane should be placed below the granular layer when:

- Used in humidity controlled areas (without vapor sensitive coverings/stored items), with the roof membrane in place, and the building enclosed to the point where precipitation will not intrude into the slab area. Consideration should be given to slight sloping of the membrane to edges where draintile or other disposal methods can alleviate potential water sources, such as pipe or roof leaks, foundation wall damp proofing failure, fire sprinkler system activation, etc.

There may be cases where membrane placement may have a detrimental effect on the subgrade support system (e.g., expansive soils). In these cases, your decision will need to weigh the cost of subgrade options and the performance risks.

BASEMENT/RETAINING WALL BACKFILL AND WATER CONTROL

DRAINAGE

Below grade basements should include a perimeter backfill drainage system on the exterior side of the wall. The exception may be where basements lie within free draining sands where water will not perch in the backfill. Drainage systems should consist of perforated or slotted PVC drainage pipes located at the bottom of the backfill trench, lower than the interior floor grade. The drain pipe should be surrounded by properly graded filter rock. A filter fabric should then envelope the filter rock. The drain pipe should be connected to a suitable means of disposal, such as a sump basket or a gravity outfall. A storm sewer gravity outfall would be preferred over exterior daylighting, as the latter may freeze during winter. For non-building, exterior retaining walls, weep holes at the base of the wall can be substituted for a drain pipe.

BACKFILLING

Prior to backfilling, damp/water proofing should be applied on perimeter basement walls. The backfill materials placed against basement walls will exert lateral loadings. To reduce this loading by allowing for drainage, we recommend using free draining sands for backfill. The zone of sand backfill should extend outward from the wall at least 2', and then upward and outward from the wall at a 30° or greater angle from vertical. As a minimum, the sands should contain no greater than 12% by weight passing the #200 sieve, which would include (SP) and (SP-SM) soils. The sand backfill should be placed in lifts and compacted with portable compaction equipment. This compaction should be to the specified levels if slabs or pavements are placed above. Where slab/pavements are not above, we recommend capping the sand backfill with a layer of clayey soil to minimize surface water infiltration. Positive surface drainage away from the building should also be maintained. If surface capping or positive surface drainage cannot be maintained, then the trench should be filled with more permeable soils, such as the Fine Filter or Coarse Filter Aggregates defined in Mn/DOT Specification 3149. You should recognize that if the backfill soils are not properly compacted, settlements may occur which may affect surface drainage away from the building.

Backfilling with silty or clayey soil is possible but not preferred. These soils can build-up water which increases lateral pressures and results in wet wall conditions and possible water infiltration into the basement. If you elect to place silty or clayey soils as backfill, we recommend you place a prefabricated drainage composite against the wall which is hydraulically connected to a drainage pipe at the base of the backfill trench. High plasticity clays should be avoided as backfill due to their swelling potential.

LATERAL PRESSURES

Lateral earth pressures on below grade walls vary, depending on backfill soil classification, backfill compaction and slope of the backfill surface. Static or dynamic surcharge loads near the wall will also increase lateral wall pressure. For design, we recommend the following ultimate lateral earth pressure values (given in equivalent fluid pressure values) for a drained soil compacted to 95% of the Standard Proctor density and a level ground surface.

	Equivalent Fluid Density	
Soil Type	**Active (pcf)**	**At-Rest (pcf)**
Sands (SP or SP-SM)	35	50
Silty Sands (SM)	45	65
Fine Grained Soils (SC, CL or ML)	70	90

Basement walls are normally restrained at the top which restricts movement. In this case, the design lateral pressures should be the "at-rest" pressure situation. Retaining walls which are free to rotate or deflect should be designed using the active case. Lateral earth pressures will be significantly higher than that shown if the backfill soils are not drained and become saturated.

Appendix A

Geotechnical Field Exploration and Testing
Boring Log Notes
Unified Soil Classification System
Rock Description Terminology
Figure 1 – Boring Locations (A1 – A8)
Subsurface Boring Logs
Sieve Analysis Test Results

Appendix A
Geotechnical Field Exploration and Testing
Report No. 01-05723

A.1 FIELD EXPLORATION

The subsurface conditions were explored by drilling and sampling eight standard penetration test (SPT) borings. The test boring locations appear on Figure 1 preceding the Subsurface Boring Logs in this appendix.

A.2 SOIL BORING SAMPLING METHODS

A.2.1 Split-Spoon Samples (SS) - Calibrated to N_{60} Values

Standard penetration (split-spoon) samples were collected in general accordance with ASTM:D1586 with one primary modification. The ASTM test method consists of driving a 2-inch O.D. split-barrel sampler into the in-situ soil with a 140-pound hammer dropped from a height of 30 inches. The sampler is driven a total of 18 inches into the soil. After an initial set of 6 inches, the number of hammer blows to drive the sampler the final 12 inches is known as the standard penetration resistance or N-value. Our method uses a modified hammer weight, which is determined by measuring the system energy using a Pile Driving Analyzer (PDA) and an instrumented rod.

In the past, standard penetration N-value tests were performed using a rope and cathead for the lift and drop system. The energy transferred to the split-spoon sampler was typically limited to about 60% of its potential energy due to the friction inherent in this system. This converted energy then provides what is known as an N_{60} blow count.

Most newer drill rigs incorporate an automatic hammer lift and drop system, which has higher energy efficiency and subsequently results in lower N-values than the traditional N_{60} values. By using the PDA energy measurement equipment, we are able to determine actual energy generated by the drop hammer. With the various hammer systems available, we have found highly variable energies ranging from 55% to over 100%. Therefore, the intent of AET's hammer calibrations is to vary the hammer weight such that hammer energies lie within about 60% to 65% of the theoretical energy of a 140-pound weight falling 30 inches. The current ASTM procedure acknowledges the wide variation in N-values, stating that N-values of 100% or more have been observed. Although we have not yet determined the statistical measurement uncertainty of our calibrated method to date, we can state that the accuracy deviation of the N-values using this method is significantly better than the standard ASTM Method.

A.2.2 Disturbed Samples (DS)/Spin-up Samples (SU)

Sample types described as "DS" or "SU" on the boring logs are disturbed samples, which are taken from the flights of the auger. Because the auger disturbs the samples, possible soil layering and contact depths should be considered approximate.

A.2.3 Sampling Limitations

Unless actually observed in a sample, contacts between soil layers are estimated based on the spacing of samples and the action of drilling tools. Cobbles, boulders, and other large objects generally cannot be recovered from test borings, and they may be present in the ground even if they are not noted on the boring logs.

A.3 SOIL CLASSIFICATION METHODS

Soil descriptions shown on the boring logs are based on the Unified Soil Classification (USC) system. The USC system is described in ASTM:D2487 and D2488. Where laboratory classification tests (sieve analysis or Atterberg Limits) have been performed, accurate classifications per ASTM:D2487 are possible. Otherwise, soil descriptions shown on the boring logs are visual-manual judgments. Charts are attached which provide information on the USC system, the descriptive terminology, and the symbols used on the boring logs.

The boring logs include descriptions of apparent geology. The geologic depositional origin of each soil layer is interpreted primarily by observation of the soil samples, which can be limited. Observations of the surrounding topography, vegetation, and development can sometimes aid this judgment.

A.4 WATER LEVEL MEASUREMENTS

The ground-water level measurements are shown at the bottom of the boring logs. The following information appears under "Water Level Measurements" on the logs:

- Date and Time of measurement
- Sampled Depth: lowest depth of soil sampling at the time of measurement
- Casing Depth: depth to bottom of casing or hollow-stem auger at time of measurement

- Cave-in Depth: depth at which measuring tape stops in the borehole
- Water Level: depth in the borehole where free water is encountered
- Drilling Fluid Level: same as Water Level, except that the liquid in the borehole is drilling fluid

The true location of the water table at the boring locations may be different than the water levels measured in the boreholes. This is possible because there are several factors that can affect the water level measurements in the borehole. Some of these factors include: permeability of each soil layer in profile, presence of perched water, amount of time between water level readings, presence of drilling fluid, weather conditions, and use of borehole casing.

A.5 ROCK CORING/DESCRIPTION
The rock coring was performed in general accordance with ASTM:D2113, using an NQ size wireline coring system. The Rock Quality Designation (RQD) was evaluated in general accordance with ASTM:D6032.

A.5 LABORATORY TEST METHODS
A.5.1 Water Content Tests
Conducted in general accordance with ASTM:D2216.

A.5.2 Sieve Analysis Tests
Conducted in general accordance with ASTM:D6913, Method A.

A.5.3 Rock Core Compressive Strength Tests
Conducted in general accordance with ASTM:D2938.

A.6 TEST STANDARD LIMITATIONS
Field and laboratory testing is done in general conformance with the described procedures. Compliance with any other standards referenced within the specified standard is neither inferred nor implied.

A.7 SAMPLE STORAGE
Unless notified to do otherwise, we routinely retain representative samples of the soils recovered from the borings for a period of 30 days.

BORING LOG NOTES

DRILLING AND SAMPLING SYMBOLS

Symbol	Definition
AR:	Sample of material obtained from cuttings blown out the top of the borehole during air rotary procedure.
B, H, N:	Size of flush-joint casing
CAS:	Pipe casing, number indicates nominal diameter in inches
COT:	Clean-out tube
DC:	Drive casing; number indicates diameter in inches
DM:	Drilling mud or bentonite slurry
DR:	Driller (initials)
DS:	Disturbed sample from auger flights
DP:	Direct push drilling; a 2.125 inch OD outer casing with an inner 1½ inch ID plastic tube is driven continuously into the ground.
FA:	Flight auger; number indicates outside diameter in inches
HA:	Hand auger; number indicates outside diameter
HSA:	Hollow stem auger; number indicates inside diameter in inches
LG:	Field logger (initials)
MC:	Column used to describe moisture condition of samples and for the ground water level symbols
N (BPF):	Standard penetration resistance (N-value) in blows per foot (see notes)
NQ:	NQ wireline core barrel
PQ:	PQ wireline core barrel
RDA:	Rotary drilling with compressed air and roller or drag bit.
RDF:	Rotary drilling with drilling fluid and roller or drag bit
REC:	In split-spoon (see notes), direct push and thin-walled tube sampling, the recovered length (in inches) of sample. In rock coring, the length of core recovered (expressed as percent of the total core run). Zero indicates no sample recovered.
SS:	Standard split-spoon sampler (steel; 1.5" is inside diameter; 2" outside diameter); unless indicated otherwise
SU	Spin-up sample from hollow stem auger
TW:	Thin-walled tube; number indicates inside diameter in inches
WASH:	Sample of material obtained by screening returning rotary drilling fluid or by which has collected inside the borehole after "falling" through drilling fluid
WH:	Sampler advanced by static weight of drill rod and hammer
WR:	Sampler advanced by static weight of drill rod
94mm:	94 millimeter wireline core barrel
▼:	Water level directly measured in boring
▽:	Estimated water level based solely on sample appearance

TEST SYMBOLS

Symbol	Definition
CONS:	One-dimensional consolidation test
DEN:	Dry density, pcf
DST:	Direct shear test
E:	Pressuremeter Modulus, tsf
HYD:	Hydrometer analysis
LL:	Liquid Limit, %
LP:	Pressuremeter Limit Pressure, tsf
OC:	Organic Content, %
PERM:	Coefficient of permeability (K) test; F - Field; L - Laboratory
PL:	Plastic Limit, %
q_p:	Pocket Penetrometer strength, tsf (approximate)
q_c:	Static cone bearing pressure, tsf
q_u:	Unconfined compressive strength, psf
R:	Electrical Resistivity, ohm-cms
RQD:	Rock Quality Designation of Rock Core, in percent (aggregate length of core pieces 4" or more in length as a percent of total core run)
SA:	Sieve analysis
TRX:	Triaxial compression test
VSR:	Vane shear strength, remolded (field), psf
VSU:	Vane shear strength, undisturbed (field), psf
WC:	Water content, as percent of dry weight
%-200:	Percent of material finer than #200 sieve

STANDARD PENETRATION TEST NOTES

(Calibrated Hammer Weight)

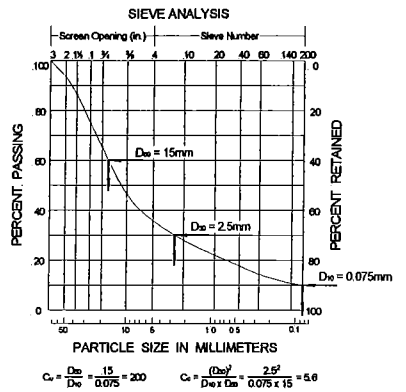
The standard penetration test consists of driving a split-spoon sampler with a drop hammer (calibrated weight varies to provide N_{60} values) and counting the number of blows applied in each of three 6" increments of penetration. If the sampler is driven less than 18" (usually in highly resistant material), permitted in ASTM: D1586, the blows for each complete 6" increment and for each partial increment is on the boring log. For partial increments, the number of blows is shown to the nearest 0.1' below the slash.

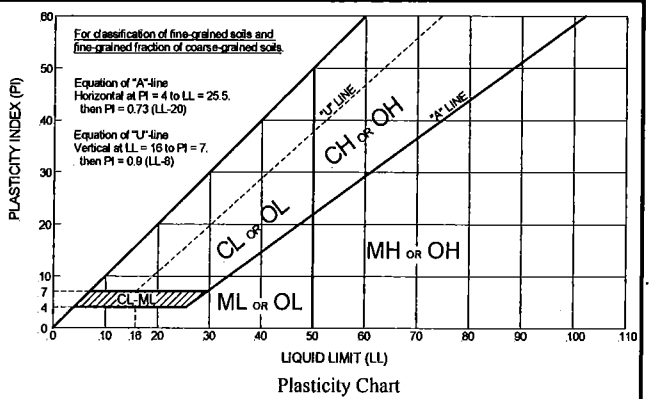
The length of sample recovered, as shown on the "REC" column, may be greater than the distance indicated in the N column. The disparity is because the N-value is recorded below the initial 6" set (unless partial penetration defined in ASTM: D1586 is encountered) whereas the length of sample recovered is for the entire sampler drive (which may even extend more than 18").

UNIFIED SOIL CLASSIFICATION SYSTEM
ASTM Designations: D 2487, D2488

AMERICAN ENGINEERING TESTING, INC.

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification Group Symbol	Soil Classification Group Name[B]
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines[C]	$Cu \geq 4$ and $1 \leq Cc \leq 3^E$	GW	Well graded gravel[F]
			$Cu < 4$ and/or $1 > Cc > 3^E$	GP	Poorly graded gravel[F]
		Gravels with Fines more than 12% fines[C]	Fines classify as ML or MH	GM	Silty gravel[F,G,H]
			Fines classify as CL or CH	GC	Clayey gravel[F,G,H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines[D]	$Cu \geq 6$ and $1 \leq Cc \leq 3^E$	SW	Well-graded sand[I]
			$Cu < 6$ and/or $1 > Cc > 3^E$	SP	Poorly-graded sand[I]
		Sands with Fines more than 12% fines[D]	Fines classify as ML or MH	SM	Silty sand[G,H,I]
			Fines classify as CL or CH	SC	Clayey sand[G,H,I]
Fine-Grained Soils 50% or more passes the No. 200 sieve (see Plasticity Chart below)	Silts and Clays Liquid limit less than 50	inorganic	PI>7 and plots on or above "A" line[J]	CL	Lean clay[K,L,M]
			PI<4 or plots below "A" line[J]	ML	Silt[K,L,M]
		organic	Liquid limit–oven dried / Liquid limit – not dried < 0.75	OL	Organic clay[K,L,M,N] / Organic silt[K,L,M,O]
	Silts and Clays Liquid limit 50 or more	inorganic	PI plots on or above "A" line	CH	Fat clay[K,L,M]
			PI plots below "A" line	MH	Elastic silt[K,L,M]
		organic	Liquid limit–oven dried / Liquid limit – not dried < 0.75	OH	Organic clay[K,L,M,P] / Organic silt[K,L,M,Q]
Highly organic soil			Primarily organic matter, dark in color, and organic in odor	PT	Peat[R]





Plasticity Chart

Notes

[A]Based on the material passing the 3-in (75-mm) sieve.

[B]If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C]Gravels with 5 to 12% fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay

[D]Sands with 5 to 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay

[E]$Cu = D_{60}/D_{10}$, $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

[F]If soil contains ≥15% sand, add "with sand" to group name.

[G]If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H]If fines are organic, add "with organic fines" to group name.

[I]If soil contains ≥15% gravel, add "with gravel" to group name.

[J]If Atterberg limits plot is hatched area, soils is a CL-ML silty clay.

[K]If soil contains 15 to 29% plus No. 200 add "with sand" or "with gravel", whichever is predominant.

[L]If soil contains ≥30% plus No. 200, predominantly sand, add "sandy" to group name.

[M]If soil contains ≥30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N]PI≥4 and plots on or above "A" line.

[O]PI<4 or plots below "A" line.

[P]PI plots on or above "A" line.

[Q]PI plots below "A" line.

[R]Fiber Content description shown below.

ADDITIONAL TERMINOLOGY NOTES USED BY AET FOR SOIL IDENTIFICATION AND DESCRIPTION

Grain Size

Term	Particle Size
Boulders	Over 12"
Cobbles	3" to 12"
Gravel	#4 sieve to 3"
Sand	#200 to #4 sieve
Fines (silt & clay)	Pass #200 sieve

Gravel Percentages

Term	Percent
A Little Gravel	3% - 14%
With Gravel	15% - 29%
Gravelly	30% - 50%

Consistency of Plastic Soils

Term	N-Value, BPF
Very Soft	less than 2
Soft	2 - 4
Firm	5 - 8
Stiff	9 - 15
Very Stiff	16 - 30
Hard	Greater than 30

Relative Density of Non-Plastic Soils

Term	N-Value, BPF
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	Greater than 50

Moisture/Frost Condition (MC Column)

D (Dry): Absence of moisture, dusty, dry to touch.

M (Moist): Damp, although free water not visible. Soil may still have a high water content (over "optimum").

W (Wet/ Waterbearing): Free water visible intended to describe non-plastic soils. Waterbearing usually relates to sands and sand with silt.

F (Frozen): Soil frozen

Layering Notes

Laminations: Layers less than ½" thick of differing material or color.

Lenses: Pockets or layers greater than ½" thick of differing material or color.

Peat Description

Term	Fiber Content (Visual Estimate)
Fibric Peat:	Greater than 67%
Hemic Peat:	33 – 67%
Sapric Peat:	Less than 33%

Organic Description (if no lab tests)

Soils are described as *organic*, if soil is not peat and is judged to have sufficient organic fines content to influence the Liquid Limit properties. *Slightly organic* used for borderline cases.

Root Inclusions

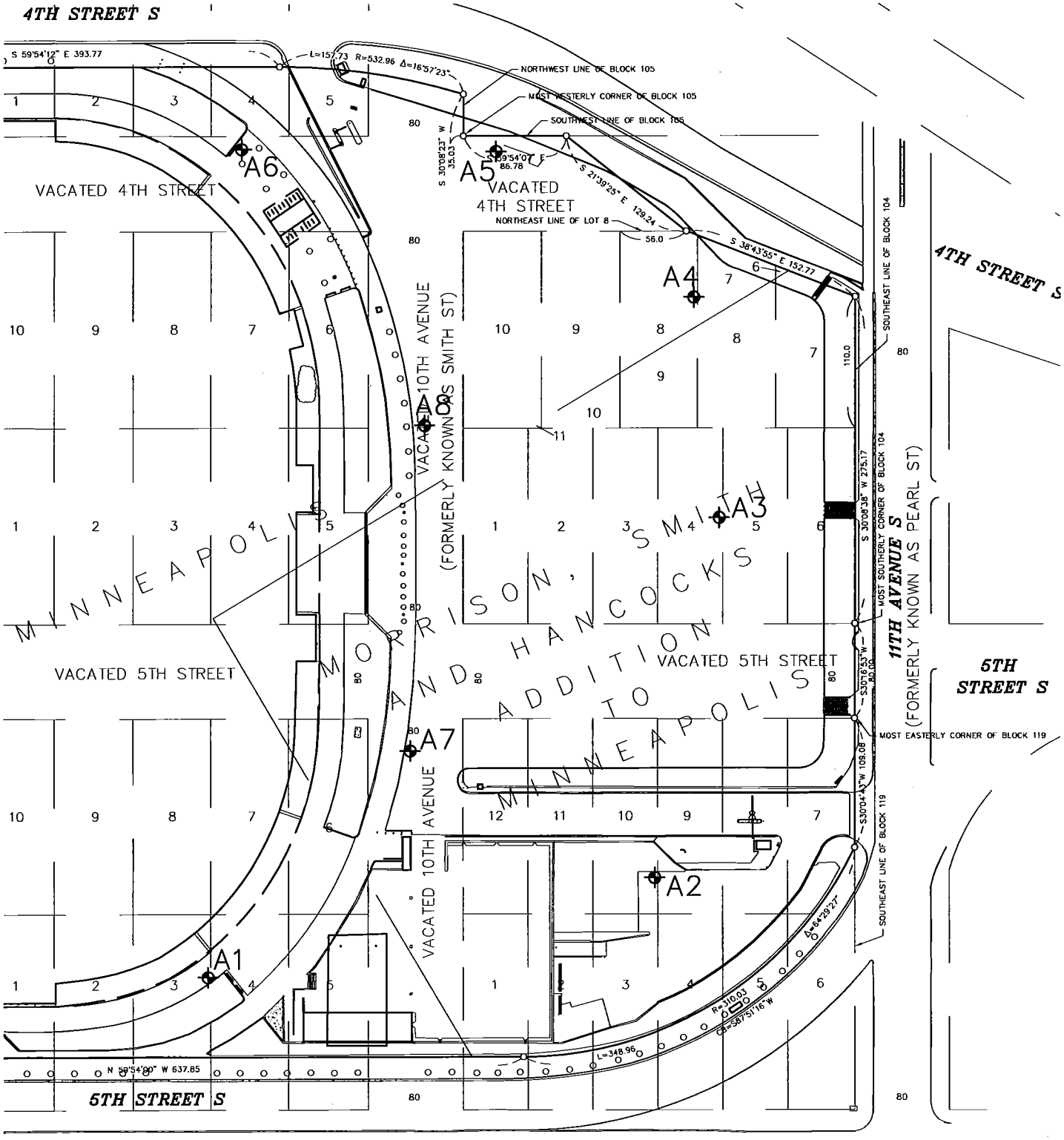
With roots: Judged to have sufficient quantity of roots to influence the soil properties.

Trace roots: Small roots present, but not judged to be in sufficient quantity to significantly affect soil properties.

ROCK DESCRIPTION TERMINOLOGY

Rock Property	Descriptive Term	Visual or Physical Properties
Weathering	Highly Weathered	Almost complete rock disintegration and decomposition. Soil-like texture with some small inclusions of hard rock.
	Very Weathered	Abundant fractures coated with oxides, carbonates, sulfates, mud, etc., thorough discoloration, rock disintegration, and mineral decomposition.
	Moderately Weathered	Some fracture coating, moderate or localized discoloration, little to no effect on cementation, slight mineral decomposition
	Slightly Weathered	A few stained fractures, slight discoloration, little to no effect on cementation, no mineral decomposition.
	Fresh	Unaffected by weathering agents, no appreciable change with depth.
Fracturing	Intensely Fractured	Less than 1" spacing
	Very Fractured	1" to 6" spacing
	Moderately Fractured	6" to 12" spacing
	Slightly Fractured	12" to 36" spacing
	Solid	36" spacing or greater
Stratification	Thinly Laminated	Less than 1/10"
	Laminated	1/10" to 2"
	Very Thinly Bedded	2" to 2"
	Thinly Bedded	2" to 2'
	Thickly Bedded	More than 2'
Hardness	Soft	Can be dug by hand and crushed by fingers.
	Moderately Hard	Friable can be gouged deeply with knife and will crumble readily under light hammer blows.
	Hard	Knife scratch leaves dust trace, will withstand a few hammer blows before breaking.
	Very Hard	Scratched with knife with difficulty, difficult to break with hammer blows.
RQD*	Very Poor	0 - 25 (%)
	Poor	25 - 50 (%)
	Fair	50 - 75 (%)
	Good	75 - 90 (%)
	Excellent	90 - 100 (%)

**Rock Quality Designation:* *Percent of core run consisting of the summation of hard, sound, and unfractured rock with core segments 4 inches or greater in length. Determination is conducted in general accordance with ASTM:D6032.*



LEGEND

⌖ = SOIL BORING LOCATION

AMERICAN ENGINEERING TESTING, INC.	SCALE 0 FEET 120'	**PROJECT** Minnesota Multi-Purpose Stadium Minneapolis, Minnesota	**AET NO.** 01-05723
		SUBJECT Boring Locations (A1 To A8)	**DATE** February 2013
		DRAWN BY VL / **CHECKED BY** JV	**FIGURE 1**

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A1 (p. 1 of 2)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

SURFACE ELEVATION: **844.6** Hennepin Co. Coordinates: N **166237** E **532415**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
0	6" Concrete pavement	FILL		F	DS						
1	FILL, mostly silty sand with gravel, brown, frozen to 2'			F	DS						
2											
3			28	M	SS	12					
4	FILL, mostly silty sand, a little gravel and clayey sand, pieces of concrete at about 10', dark brown and brown										
5			18	M	SS	6					
6											
7											
8			22	M	SS	5					
9											
10			53	M	SS	10					
11											
12											
13			30	M	SS	3					
14											
15			27	M	SS	10					
16											
17											
18			50	M	SS	18					
19											
20			50	M	SS	16					
21											
22											
23			66	M	SS	18					
24											
25			60	M	SS	18					
26											
27											
28			70	M	SS	18					
29											
30			48	M	SS	18					
31											

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS						
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
0-52.3' 4.25" HSA							
BORING COMPLETED: **2/18/13**							
DR: **GH** LG: **JMM** Rig: **85C**							

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/25/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A1 (p. 2 of 2)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

Hennepin Co. Coordinates: N **166237** E **532415**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
33			65	M	SS	18					
34	FILL, mostly silty sand, a little gravel, pieces of concrete, brown										
35			70	M	SS	18					
36											
37											
38			60	M	SS	18					
39	FILL, mostly silty sand, a little gravel, brown										
40			55	M	SS	18					
41											
42	SILTY SAND, a little gravel, gray, very stiff, laminations of sand (SM)	TILL									
43			16	M/W	SS	18					
44	GRAVEL WITH SAND, apparent cobbles, brown, moist to waterbearing, very dense (GP)	COARSE ALLUVIUM									
45			97	M	SS	8					
46											
47				▽							
48			100	M/W	SS	4					
49	GRAVELLY SAND, apparent cobbles, medium to coarse grained, brown, waterbearing, very dense (SP) *25/0.5 + 55/0.1										
50			*	W	SS	6					
51											
52			50/0	-	SS	0					
53	LIMESTONE, gray Weathering: Slightly weathered Fracturing: Intensely to very fractured Stratification: Very thinly bedded Hardness: Hard	PLATTEVILLE FORMATION MAGNOLIA MEMBER			NQ	36		100	22	61	
54											
55											
56	LIMESTONE, light gray and light brownish gray, fossiliferous Weathering: Slightly weathered Fracturing: Very fractured to slightly fractured Stratification: Thickly bedded Hardness: Hard				NQ	56		93	48	80	
57											
58											
59											
60											
61	LIMESTONE, gray Weathering: Slightly weathered to fresh Fracturing: Intensely to moderately fractured Stratification: Thinly bedded Hardness: Hard	PLATTEVILLE FORMATION HIDDEN**			NQ	20		83	16.5	69	
62	**END OF BORING**	**FALLS MEMBER									

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/25/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A2 (p. 1 of 2)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

SURFACE ELEVATION: **833.2** Hennepin Co. Coordinates: N **166110** E **532780**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
0	5" Bituminous pavement	FILL			SU						
1	FILL, mostly silty sand with gravel, dark brown, frozen			F	SU						
2											
3				F	SU						
4	FILL, mostly sand with silt, a little gravel, light brown			M	SU						
5	FILL, mostly sand, light brown		12	M	SS	14					
6											
7	FILL, mostly sand with silt, a little clayey sand, brown										
8			9	M	SS	14					
9											
10	FILL, mostly sand with silt, a little gravel, brown and gray		10	M	SS	6					
11											
12											
13			9	M	SS	16					
14											
15			9	M	SS	14					
16											
17											
18	FILL, mostly sand, a little gravel, brown		63	M	SS	14					
19	GRAVELLY SAND WITH SILT, possible cobble, fine to medium grained, brown, moist, dense (SP-SM)	COARSE ALLUVIUM									
20	*43/0.5 + 50/0.4		*	M	SS	4					
21											
22	SILTY SAND, a little gravel, brown, dense (SM)										
23			36	M	SS	16					
24	GRAVELLY SAND WITH SILT, fine to medium grained, brown, moist, medium dense (SP-SM)										
25											
26			30	M	SS	12					
27	CLAYEY SAND, a little gravel, brownish gray, very stiff (SC)	TILL					17				
28	SILTY SAND, a little gravel, brown, medium dense, lenses and laminations of clayey sand (SM)		19	M	SS	14					
29											
30	CLAYEY SAND, a little gravel, gray, stiff (SC/SM)		13	M	SS	16	12				
31											

DEPTH:	DRILLING METHOD
0-40.9'	**4.25" HSA**
41.4-51.4'	**NQ Core**

BORING COMPLETED: **2/16/13**

DR: **DS** LG: **JJ** Rig: **33C**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
2/16/13	**10:20**	**36.0**	**34.5**	**35.9**		**None**
2/16/13	**10:40**	**36.0**	**34.5**	**35.9**		**34.7**

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/25/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A2 (p. 2 of 2)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

Hennepin Co. Coordinates: N **166110** E **532780**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
33	SAND WITH SILT, fine grained, brown, moist to wet, loose (SP-SM) *(continued)*	COARSE ALLUVIUM *(continued)*	9	M/W	SS	14					
34											
35	SANDY LEAN CLAY, a little gravel, gray, hard, laminations of silt (CL)	TILL	45	M	SS	18	17				
36											
37	GRAVELLY SAND WITH SILT, possible cobbles, coarse to medium grained, gray to brown, waterbearing, very dense (SP-SM)	COLLUVIUM OR COARSE ALLUVIUM	**	W	SS	6					9
38											
39	**9/0.5 + 50/0.3										
40	***46/0.5 + 50/0.3		***	W	SS	8					
41	LIMESTONE, light brownish gray, a little brown around 47.5', a few vuggy zones	PLATTEVILLE FORMATION MAGNOLIA MEMBER									
42	Weathering: Moderately to slightly weathered										
43	Fracturing: Very to moderately fractured										
44	Stratification: Thickly bedded				NQ	42		70	15	25	
45	Hardness: Hard										
46	Rock compressive strength at 42.2' = 12,280 psi										
47											
48											
49					NQ	60		100	45	75	
50											
51											
	END OF BORING										

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/25/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A3 (p. 1 of 3)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

SURFACE ELEVATION: **843.0** Hennepin Co. Coordinates: N **166343** E **532983**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
0	5.25" Bituminous pavement	FILL			SU						
1	FILL, mostly silty sand with gravel, dark brown, frozen			F	SU						
2	FILL, mixture of silty sand and clayey sand, with gravel, apparent cobbles, brown, frozen to 3.5'			F	SS	16	7				
3											
4											
5			21	M	SS	10	6				
6											
7											
8			6	M	SS	11	10				
9											
10	FILL, mostly silty sand, a little gravel, dark brown		25	M	SS	16					
11											
12	FILL, mostly clayey sand with organic fines, a little gravel, pieces of brick, dark brown										
13			8	M	SS	14	18				
14											
15	FILL, mostly silty sand, a little gravel, pieces of concrete, dark brown		20	M	SS	2					
16											
17	CLAYEY SAND, a little gravel, brown, very stiff (SC)	TILL									
18			19	M	SS	16	12				
19											
20	SILTY SAND WITH GRAVEL, apparent cobbles, brown, very dense (SM)		100/.9	M	SS	6					
21											
22	SILTY SAND, a little gravel, brown, medium dense (SM)										
23			23	M	SS	16					
24											
25	CLAYEY SAND, a little gravel, brown, stiff (SC)										
26			10	M/W	SS	24	15				
27											
28	SAND WITH GRAVEL, apparent cobbles, fine to medium grained, light brown, moist, medium dense (SP)	COARSE ALLUVIUM	29	M	SS	10					
29											
30	SAND, fine to medium grained, light brown, moist, dense (SP)		33	M	SS	14					
31											

DEPTH:	DRILLING METHOD
0-52'	**3.25" HSA**
52-52.5'	**RDF w/DM**
52.5-80.8'	**NQ Core**
BORING COMPLETED:	**2/14/13**
DR: **SG**	LG: **SB** Rig: **91C**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
2/14/13	**11:00**	**48.5**	**47.0**	**47.0**		**46.7**
2/14/13	**11:15**	**48.5**	**47.0**	**47.0**		**46.4**

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/25/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A3 (p. 2 of 3)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

Hennepin Co. Coordinates: N **166343** E **532983**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
33	SAND WITH GRAVEL, apparent cobbles, fine to medium grained, light brown, moist, very dense (SP) *(continued)*		71/.95	M	SS	16					
34											
35	SILTY SAND WITH GRAVEL, apparent cobble, fine grained, brown, moist, very dense (SM)		*	M	SS	5					
36											
37	*54/0.5+100/0.3		50/0.2	M	SS	1					
38											
39	SAND WITH SILT AND GRAVEL, medium to fine grained, light brown, moist, very dense (SP-SM)										
40			100/.9	M	SS	17					
41											
42											
43			100/.9	M	SS	17					
44											
45	SAND WITH SILT AND GRAVEL, apparent cobbles, fine to medium grained, brown, very dense (SP-SM)		**	M	SS	14					
46	**50/0.5 + 65/0.6 + 35/0.2			▼							
47	GRAVEL WITH SAND AND SILT, apparent cobbles, light brown, waterbearing, very dense (GP-GM)	COARSE ALLUVIUM OR COLLUVIUM	63	W	SS	16					
48											
49											
50	***22/0.5 + 40/0.5 + 60/0.2		***	W	SS	11					8
51											
52	LIMESTONE SLAB OVER GRAVEL, light gray to brownish gray	COLLUVIUM	50/0	W	SS	0					
53					NQ	2.5		104			
54	LIMESTONE, light brownish gray to about 57.5' then light gray and gray, fossiliferous above 57.6'	PLATTEVILLE FORMATION MAGNOLIA MEMBER			NQ	35		94	25	67	
55	Weathering: Slightly weathered										
56	Fracturing: Very to moderately fractured										
57	Stratification: Thickly bedded										
58	Hardness: Hard										
59	Rock compressive strength at 53.8' = 10,290 psi				NQ	57		95	40	67	
60	Rock compressive strength at 58.7' = 19,550 psi										
61	LIMESTONE, gray and light gray to about 61' then gray, 1-inch clay seam at 60.8', lenses of shale at 62.1' and 62.8'	PLATTEVILLE FORMATION HIDDEN FALLS MEMBER									
62											
63	Weathering: Slightly weathered				NQ	52		87	30	50	
64	Fracturing: Very to moderately fractured										
65	Stratification: Thickly bedded										
66	Hardness: Hard										
67	Rock compressive strength at 63.5' = 11,120 psi										
68	Rock compressive strength at 65.3' = 14,470 psi										
69	LIMESTONE, light gray and gray, crinkly bedded	PLATTEVILLE FORMATION MIFFLIN MEMBER									
	Weathering: Slightly weathered to fresh				NQ	58		97	53	88	
	Fracturing: Very fractured to slightly fractured										
	Stratification: Very thinly bedded										

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/25/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A3 (p. 3 of 3)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

Hennepin Co. Coordinates: N **166343** E **532983**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
71	Hardness: Hard Rock compressive strength at 69.5' = 7,570 psi	PLATTEVILLE FORMATION MIFFLIN MEMBER *(continued)*			NQ	60		100	57	95	
72											
73											
74	Rock compressive strength at 74.1' = 10,140 psi										
75											
76											
77											
78					NQ	35		58	30	50	
79	LIMESTONE, gray, vuggy Weathering: Slightly weathered Fracturing: Very fractured Stratification: Thinly bedded Hardness: Moderately hard (recovery ends around 79.7')	PLATTEVILLE FORMATION PECATONICA MEMBER									
80	**END OF BORING**										

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/25/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A4 (p. 1 of 2)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

SURFACE ELEVATION: **842.4** Hennepin Co. Coordinates: N **166510** E **533058**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
0	4.5" Bituminous pavement	FILL									
1	6" FILL, mostly gravelly silty sand, pieces of concrete, dark brown, frozen			F	SS	6	9				
2											
3	FILL, mixture of silty sand and clayey sand, with gravel, pieces of brick, brown, frozen			F	SS	16					
4	FILL, mostly silty sand with gravel, dark brown, frozen to 4'										
5			20	M	SS	12					
6											
7	FILL, mostly silty sand, a little gravel, pieces of concrete, glass and wood, dark brown										
8			22	M	SS	10					
9											
10			14	M	SS	14					
11											
12											
13			8	M	SS	12	10				
14	FILL, mostly clayey sand, a little gravel, brown										
15	SAND WITH SILT, a little gravel, medium to fine grained, brown, moist, medium dense (SP-SM) (possible fill)	COARSE ALLUVIUM OR FILL	13	M	SS	10					
16											
17	SAND, fine to medium grained, light brown, moist, loose (SP)	COARSE ALLUVIUM									
18			10	M	SS	10					
19											
20	SAND WITH SILT, a little gravel, apparent cobbles, fine to medium grained, dark brown, moist, very dense (SP-SM)		69/0.8	M	SS	14					
21											
22	SAND, a little gravel, fine to medium grained, brown to light brown, moist, very dense to medium dense (SP)										
23			17	M	SS	10					
24											
25			21	M	SS	14					
26											
27	SAND, a little gravel, medium to fine grained, grayish brown, moist, medium dense (SP)										
28			19	M	SS	16					
29											
30			25	M	SS	14					
31											

DEPTH:	DRILLING METHOD
0-49.9'	**3.25" HSA**
49.9-59.6'	**NQ Core**
BORING COMPLETED:	**2/15/13**
DR: **SS**	LG: **TK** Rig: **85C**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
2/14/13	**12:55**	**48.7**	**47.0**	**46.3**		**46.1**
2/14/13	**1:00**	**48.7**	**47.0**	**46.3**		**46.1**

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/25/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A4 (p. 2 of 2)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

Hennepin Co. Coordinates: N **166510** E **533058**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
33	SAND, fine grained, light brown, moist, dense to very dense (SP) *(continued)*		43	M	SS	14					
34											
35			59	M	SS	12					
36											
37											
38			60	M	SS	2					
39											
40			43	M	SS	14					
41											
42	SAND WITH SILT AND GRAVEL, fine to medium grained, brown, moist, dense (SP-SM)										
43			45	M	SS	12					
44											
45	*27/0.5 + 50/0.3		*	M	SS	8					
46	GRAVEL WITH SAND, light grayish brown, moist, very dense (GP)	COARSE ALLUVIUM OR COLLUVIUM		▼							
47	GRAVELLY CLAYEY SAND, brown, hard, lenses and laminations of silty sand (SC)										
48		COLLUVIUM	79	M/W	SS	12	9				
49											
50			100/0	M	SS	1					
51	LIMESTONE SLAB, gray and light gray										
52	LIMESTONE, light brownish gray to about 57.8' then gray and light gray, fossiliferous above 57.8'	PLATTEVILLE FORMATION MAGNOLIA MEMBER			NQ	56		99	13	23	
53	Weathering: Moderately to slightly weathered										
54	Fracturing: Intensely to slightly fractured										
55	Stratification: Thickly bedded										
56	Hardness: Moderately hard to hard										
57					NQ	42		70	29	48	
58											
59											
	END OF BORING										

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/25/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A5 (p. 1 of 2)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

SURFACE ELEVATION: **839.8** Hennepin Co. Coordinates: N **166704** E **532979**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
1	5.75" Bituminous pavement	FILL		F							
2	6" FILL, mostly gravelly silty sand, dark brown, frozen			F							
3	FILL, mostly silty sand with gravel, a little clayey sand, pieces of concrete around 5', dark brown, frozen to 4'			F	SS	12					
4											
5	*13/0.5 + 60/0.2		60/.2	M	SS	6					
6											
7											
8			24	M	SS	10					
9											
10			35	M	SS	12					
11											
12	FILL, mixture of sandy lean clay and sand with silt, a little gravel, brownish gray and brown										
13			23	M	SS	10	9				
14	FILL, mostly gravel, brown										
15			50/.2	M	SS	1					
16	GRAVELLY SAND WITH SILT, fine to medium grained, brown, moist, very dense (SP-SM)	COARSE ALLUVIUM									
17											
18			54	M	SS	10					
19											
20			98	M	SS	8					
21											
22	SILTY SAND, a little gravel, brown, very dense (SM)	TILL									
23			98	M	SS	14					
24											
25			85	M	SS	16					
26											
27											
28			61	M	SS	14					
29											
30	SAND WITH GRAVEL, fine to medium grained, brown, dense to very dense (SP)	COARSE ALLUVIUM	43	M	SS	12					
31											

DEPTH:	DRILLING METHOD
0-49.7'	3.25" HSA
49.7-55.6'	NQ Core
BORING COMPLETED:	2/18/13
DR: SS	LG: TK Rig: 85C

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
2/15/13	3:00	35.6	34.5	35.3		35.0
2/15/13	4:55	47.1	46.8	46.7		44.7
2/16/13	8:30	47.1	46.8	46.7		43.6
2/16/13	1:30	49.7	49.5	48.1		46.2

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/25/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A5 (p. 2 of 2)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

Hennepin Co. Coordinates: N **166704** E **532979**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
33	SAND WITH GRAVEL, fine to medium grained, brown, dense to very dense (SP) *(continued)*	COARSE ALLUVIUM *(continued)*	68	M	SS	12					
34											
35	SAND WITH SILT AND GRAVEL, fine to medium grained, brown, waterbearing, very dense (SP-SM)		**	W/M	SS	12					
36											
37	GRAVEL WITH CLAY AND SAND, brown, moist, dense (GC)										
38	SAND, fine to medium grained, light brown, moist, very dense (SP)		55	M	SS	16					
39											
40	SILTY SAND WITH GRAVEL, fine to medium grained, brown, moist, very dense (SM)		96	M	SS	10					
41											
42	GRAVEL WITH SAND, brown, moist, very dense (GP)	TILL									
43			73	M	SS	14					
44	SILTY SAND WITH GRAVEL, dark brown, a little brown, very dense, lenses of clayey sand (SM)										
45							13				
46	SANDY LEAN CLAY, a little gravel, gray, hard (CL)	COARSE ALLUVIUM	57	M/W	SS	14					
47	GRAVELLY SILTY SAND, fine to medium grained, gray, wet, very dense (SM)	HIGHLY FRACTURED PLATTEVILLE FORMATION OR COLLUVIUM	100/.3	W	SS	1					
48	WEATHERED LIMESTONE, brown to light gray										
49											
50			100/.15	W	SS	1					
50	LIMESTONE, light brownish gray to gray, fossiliferous				NQ	8		83	7	73	
51	Weathering: Moderately to slightly weathered	PLATTEVILLE FORMATION MAGNOLIA MEMBER									
52	Fracturing: Very fractured										
53	Stratification: Thickly bedded				NQ	45		75	13	22	
53	Hardness: Hard										
54											
55											

END OF BORING

**14/0.5 + 31/0.5 + 50/0.1

Note: Core barrel became wedged and broke off. Barrel and most of core were retrieved, although bottom 0.9' remained in ground. Drillers reported coring was continuously solid with no obvious voids.

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A6 (p. 1 of 2)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

SURFACE ELEVATION: **842.6** Hennepin Co. Coordinates: N **166819** E **532796**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
1	5.5" Concrete pavement	FILL			SU						
1	FILL, mostly silty sand with gravel, dark brown, frozen			F	SU						
2											
3	FILL, mostly silty sand, a little gravel and clayey sand, dark brown, frozen to 3.5'			F	SS	16					
4											
5			7	M	SS	10					
6											
7	FILL, mostly silty sand with gravel, pieces of concrete, dark brown										
8	*6/0.5 + 17/0.5 + 50/0.2		*	M	SS	12					
9											
10	FILL, mostly clayey sand, a little gravel, dark brown		5	M	SS	12	16				
11											
12	FILL, mostly sand with silt, brown										
13			18	M	SS	13					
14											
15	FILL, mostly sand with silt, a little gravel, apparent cobble at 18', dark brown		11	M	SS	12					
16											
17											
18			20	M	SS	14					
19											
20	FILL, mostly silty sand with gravel, apparent cobbles, brown		42	M	SS	5					
21											
22	SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP)	COARSE ALLUVIUM	17	M	SS	14					
23											
24	SAND, a little gravel, possible cobble, medium to fine grained, light brown, moist, dense (SP)										
25			32	M	SS	15					
26											
27	GRAVELLY SAND, apparent cobbles, medium to fine grained, light brown, moist, very dense (SP)										
28			59	M	SS	6					
29											
30	GRAVEL WITH SAND, apparent cobbles, brown, moist, very dense (GP)		55	M	SS	12					
31											

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS						
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
0-47.5' 3.25" HSA	**2/18/13**		**47.2**	**47.5**			**None****
							****Wet**
BORING COMPLETED: **2/18/13**							
DR: **SG** LG: **SB** Rig: **91C**							

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/25/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A6 (p. 2 of 2)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

Hennepin Co. Coordinates: N **166819** E **532796**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
33	SILTY SAND, a little gravel, apparent cobbles, brown, very dense (SM) *(continued)*	TILL *(continued)*	**	M	SS	14					
34											
35	**36/0.5 + 69/0.5 + 31/0.2		***	M	SS						
36	***35/0.5 + 68/0.5 + 32/0.1										
37											
38			74	M	SS						
39											
40	SAND WITH GRAVEL, medium to fine grained, brown, moist, dense, laminations of clayey sand (SP)	COARSE ALLUVIUM	47	M	SS	15					
41											
42	SAND WITH SILT AND GRAVEL, medium to fine grained, brown, moist, dense (SP-SM)										
43			58	M	SS	18					
44											
45	GRAVELLY SAND WITH SILT, medium to fine grained, brown, moist to waterbearing, very dense (SP-SM)	COARSE ALLUVIUM OR COLLUVIUM	64	M/W	SS	12					
46											
47	SANDY LEAN CLAY, a little gravel, gray, hard (CL)	TILL	50/.2	M	SS	2	16				
48	LIMESTONE, light gray and gray to about 49' then light brownish gray, fractured and weathered zones from 48' to 48.3' and 48.7' to 48.8', vertical fracture from 52.5' to 52.9', fossiliferous, a few vuggy zones Weathering: Moderately to slightly weathered Fracturing: Very to moderately fractured Stratification: Thickly bedded Hardness: Hard	PLATTEVILLE FORMATION MAGNOLIA MEMBER			NQ	25		72	17	49	
49											
50											
51											
52											
53					NQ	56		93	28	47	
54											
55											
56											
57	LIMESTONE, gray, vertical fractures at 57.9' and 59' Weathering: Slightly weathered Fracturing: Very to moderately fractured Stratification: Thickly bedded Hardness: Hard	PLATTEVILLE FORMATION HIDDEN FALLS MEMBER			NQ	50		83	24	40	
58											
59											
60											
	END OF BORING										

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/25/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A7 (p. 1 of 2)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

SURFACE ELEVATION: **842.6** Hennepin Co. Coordinates: N **166300** E **532654**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
0	6" Bituminous pavement	FILL			SU						
1	FILL, mostly silty sand with gravel, apparent cobbles, dark brown to brown, frozen to 4'			F	SU						
2				F	SS	3					
3											
4											
5			33	M	SS	15					
6											
7	FILL, mostly sand, a little gravel, brown										
8			20	M	SS	12					
9											
10	FILL, mostly sand, light brown		18	M	SS	12					
11											
12	FILL, mostly gravelly sand with silt, apparent cobbles, brown										
13			110	M	SS	10					
14											
15	FILL, mixture of clayey sand and silty sand, a little gravel, brown and gray		26	M	SS	16	11				
16											
17	GRAVELLY SILTY SAND, brown, dense (SM)	TILL									
18			39	M	SS	3					
19											
20	CLAYEY SAND, a little gravel, apparent cobbles, brown, hard to very stiff, laminations of silty sand (SC/SM)		88	M	SS	5	12				
21											
22											
23			16	M	SS	16	12				
24	SAND WITH SILT, fine grained, light brown, moist, medium dense (SP-SM)	COARSE ALLUVIUM									
25			13	M	SS	14					
26											
27	SILTY SAND WITH GRAVEL, fine to medium grained, brown, moist, dense (SM)										
28			36	M	SS	12					
29											
30	GRAVEL WITH SAND, brown, moist, very dense to dense (GP)		61	M	SS	13					
31											

DEPTH:	DRILLING METHOD
0-49½'	**3.25" HSA**
49½-49.8'	**RD w/DM**
BORING COMPLETED:	**2/21/13**
DR: **SG**	LG: **SB** Rig: **91C**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
2/20/13		**49.5**	**49.5**			**None**

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/25/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A7 (p. 2 of 2)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

Hennepin Co. Coordinates: N **166300** E **532654**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
33	GRAVEL WITH SAND, brown, moist, very dense to dense (GP) *(continued)*		28	M	SS	10					
34											
35			99	M	SS	13					
36											
37	SILTY SAND WITH GRAVEL, apparent cobbles, dark brown, very dense (SM)	TILL									
38			*	M	SS	15					
39	**22/0.5 + 58/0.5 + 42/0.3										
40			50/0.3	M	SS	3					
41											
42			50/0.2	M	SS	2					
43											
44											
45			50/0.1	M	SS	1					
46	SILTY SAND WITH GRAVEL, possible cobbles, brown, very dense, laminations of clayey sand (SM)	COLLUVIUM									
47			83/0.5	M	SS	5					
48											
49											
50	LIMESTONE SLAB, gray		50/.05	M	SS	½					
51	LIMESTONE SLABS AND GRAVEL, gray and dark brown										
52					NQ	38		67	16	28	
53	LIMESTONE, light brownish gray, fossiliferous, a few vuggy zones, clay seam at 52.8'	PLATTEVILLE FORMATION MAGNOLIA MEMBER									
54	Weathering: Slightly weathered Fracturing: Intensely to moderately fractured Stratification: Thickly bedded Hardness: Hard										
	END OF BORING										
	Note RQD = 54% in Magnolia Member (lower 2.5')										

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/25/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A8 (p. 1 of 2)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

SURFACE ELEVATION: **842.1** Hennepin Co. Coordinates: N **166533** E **532812**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
0	4" Bituminous pavement	FILL		F	SU						
1	FILL, mostly silty sand with gravel, pieces of concrete around 2', dark brown, frozen			F	SU						
2					SU						
3				F	SS	12					
4	FILL, mostly silty sand, a little gravel, pieces of brick, apparent cobbles, dark brown										
5			25	M	SS	14					
6											
7											
8			18	M	SS	12					
9	FILL, mostly gravel and silty sand, apparent cobbles, brown										
10			48	M	SS	10					
11											
12	FILL, mostly sand with silt, brown										
13			10	M	SS	16					
14	FILL, mostly silty sand, a little gravel, apparent cobbles, brown and grayish brown										
15			19	M	SS	6					
16											
17	FILL, mostly sand, light brown										
18			15	M	SS	13					
19	FILL, mostly sand with silt, a little gravel, brown										
20			7	M	SS	10					
21											
22	FILL, mostly gravelly silty sand, apparent cobbles, dark brownish gray (petroleum-type odor)		50/.2	M	SS	2					
23											
24	SANDY LEAN CLAY, a little gravel, gray, very stiff (CL) (petroleum-type odor)	TILL									
25			16	M	SS	18	12				
26											
27											
28	SILTY SAND, a little gravel, apparent cobble, gray, dense (SM)		36	M	SS	16	16				
29											
30	SANDY LEAN CLAY WITH GRAVEL, apparent cobbles, gray, a little brownish gray, hard, a lens of silty sand around 30' (CL)		68	M	SS	15	4				
31											

DEPTH:	DRILLING METHOD
0-51.2'	**3.25" HSA**
51.2-60.2'	**NQ Core**
BORING COMPLETED:	**2/16/13**
DR: **SG**	LG: **SB** Rig: **91C**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
2/14/13	**2:40**	**48.5**	**47.0**	**47.0**		**46.3**
2/14/13	**2:50**	**48.5**	**47.0**	**47.0**		**46.4**

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/25/13

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **01-05723** LOG OF BORING NO. **A8 (p. 2 of 2)**

PROJECT: **Minnesota Multi-Purpose Stadium; Minneapolis, MN**

Hennepin Co. Coordinates: N **166533** E **532812**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	REC %	RQD IN.	RQD %	%-#200
33	SILTY SAND, a little gravel, gray, medium dense (SM) *(continued)*		18	M	SS	13					
34											
35			19	M	SS	16					
36											
37											
38			10	M	SS	8					
39											
40	CLAYEY SAND, a little gravel, gray, very stiff (SC)		20	M	SS	17	14				
41	SAND, fine grained, light brown, moist, medium dense (SP)										
42											
43			73	M	SS	5					
44											
45	SAND WITH SILT AND GRAVEL, apparent cobbles, fine to medium grained, brown, moist, very dense (SP-SM)	COARSE ALLUVIUM	80/.5	M	SS	1					
46				▼							
47	GRAVELLY SAND WITH SILT, medium to coarse grained, brown, very dense (SM)	COLLUVIUM OR TILL									
48			51	W	SS	8					
49											
50	SAND, a little gravel, apparent cobbles, fine to medium grained, brown, waterbearing, very dense (SP)	COARSE ALLUVIUM	50/.4	W	SS	9	12				
51	GRAVELLY CLAYEY SAND, gray, hard (SC)	TILL									
52	LIMESTONE, light brownish gray, a few vuggy zones, fossiliferous	PLATTEVILLE FORMATION MAGNOLIA MEMBER									
53	Weathering: Slightly weathered				NQ	48		100	20	42	
54	Fracturing: Very fractured										
55	Stratification: Thickly bedded										
56	Hardness: Hard										
57	LIMESTONE, gray										
58	Weathering: Weathered				NQ	26		43	*	*	
59	Fracturing: Very fractured										
60	Stratification: Thickly bedded										
	Hardness: Hard										
	END OF BORING										

**Lower 2½' of core could not be retrieved. Portion retrieved likely disturbed by retrieval attempts.*

AET_CORP W-COORDINATES 01-05723.GPJ AET+CPT+WELL.GDT 2/19/13

SIEVE ANALYSIS TEST RESULTS

PROJECT:
Minnesota Multi-Purpose Stadium
Minneapolis, Minnesota

AET NO.: 01-05723

DATE: February 19, 2013

TEST METHOD: General Conformance with ASTM: D6913, Method A

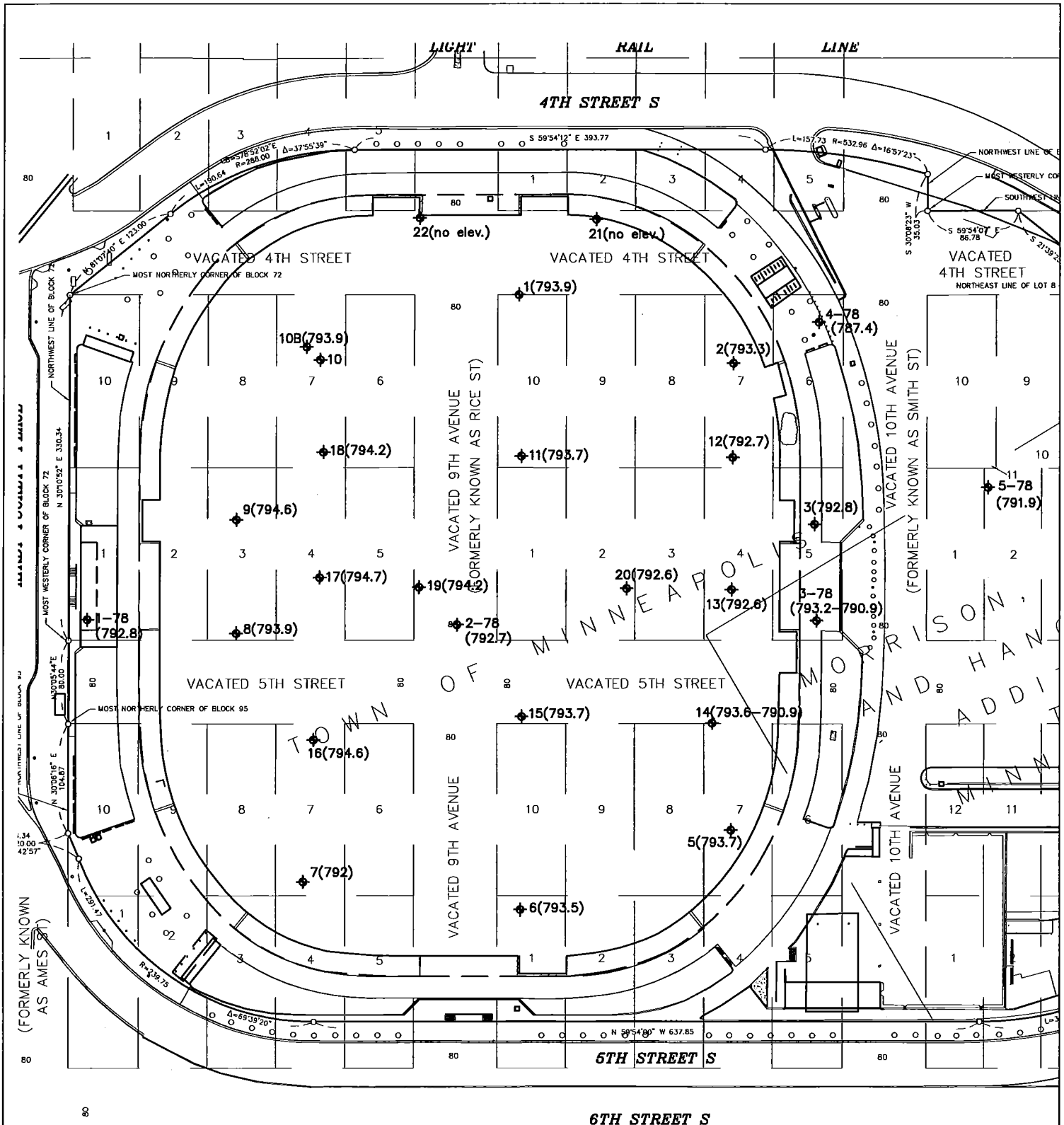
RESULTS:

Boring Number	A2	A3
Sample Depth	37'-38'	49.5'-50.7'
Dry Sample Weight (gms)	224.70	348.18
Sieve Size or Number	**Percent Passing by Weight**	
1½"	100	100
1"	100	90
3/4"	86	78
5/8"	82	73
1/2"	80	67
3/8"	69	60
#4	51	48
#10	34	37
#20	23	25
#40	18	18
#100	12	11
#200	9.4	8.2

Note: The small sample size limits the accuracy of the test, and the sample may not necessarily be representative of the entire layer shown on the boring log.

Appendix B

Figure 2 – Past Boring Locations/Top of Bedrock Elevations
1978 – 1979 Soil Exploration Co. Boring Logs
2008 Braun Intertec Boring Logs and Location Figure



LEGEND

⊕ = SOIL BORING LOCATION

AMERICAN ENGINEERING TESTING, INC.	SCALE 0 FEET 130'	**PROJECT** Minnesota Multi-Purpose Stadium Minneapolis, Minnesota	**AET NO.** 01-05723
		SUBJECT Past Boring Locations / Top of Bedrock Elevations	**DATE** February 2013
		DRAWN BY VL / **CHECKED BY** JV	**FIGURE 2**

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO 1

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL — SURFACE ELEVATION 838.0' (127.7')	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL/PL	Qu
	SILTY SAND, a little gravel, black, frozen to 1' then moist (SM) (may be fill)	TOPSOIL or MAY BE FILL			1	HSA				
2	SILTY SAND, fine grained, a trace of gravel, dark brown, moist (SM)	COARSE ALLUVIUM			2	HSA				
4	SAND, medium grained, a little gravel, some pieces of weathered limestone, brown, moist, medium dense, a few lenses of (See#1)		10		3	SS				
6½	SILTY SAND, a little gravel, brown, moist, medium dense to dense (SM)	TILL	11		4	SS				
			17		5	SS				
			22		6	SS				
15	SAND, fine grained, light brown, moist, medium dense (SP-SM)	COARSE ALLUVIUM	14		7	SS				
19	SAND, medium to fine grained, some gravel, a few cobbles, brown, moist, very dense (SP-SM)		48		8	SS				
21½	SILTY SAND, a little gravel, a few cobbles and boulders, brown, moist, very dense (SM)	TILL	49/0.5		9	SS				
			100/0.0		-	--				
35	Continued on next page									

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SE-3 (77-8)-4

LOG OF TEST BORING

JOB NO 120-4131 VERTICAL SCALE 1" = 4' BORING NO. 1 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LAB TESTS W	D	LL/PL	Qu
35	SILTY SAND (Cont.)		65/0.5		10	SS				
35½	SAND, medium grained, some gravel, brown, moist, very dense (SP)	COARSE ALLUVIUM	98		11	SS				
42	No sample recovered. Appears to be SILTY SAND, a little gravel, brown, moist, very dense based on (See#2)	TILL								
44.1±	LIMESTONE, light brownish gray with some lenses of brown to about 55' then gray to about 60½' then light gray and gray mottled, weathered above about 45½'	PLATTEVILLE FORMATION	100%		(74%)	BX				
		Magnolia Member	100%		(52%)	BX				
			100%		(73%)	BX				
		Hidden Falls Member	100%		(58%)	BX				
			100%		(0)	BX				
		Mifflin Member	100%		(55%)	BX				
			100%		(56%)	BX				
70	Continued on next page									

LOG OF TEST BORING

JOB NO 120-4131 VERTICAL SCALE 1" = 4' BORING NO 1 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N or R	W	SAMPLE NO	SAMPLE TYPE	LAB TESTS W	D	LL/PL	Qu
70	LIMESTONE (Cont.)	PLATTEVILLE FORMATION (Cont.)								
		Pecatonica Member	100%	(14%)		BX				
74½±	SHALE, gray to about 76½' then greenish gray and brown, shaly sandstone below about 76½'	GLENWOOD FORMATION	100%	(0%)		BX				
78±	SANDSTONE, light brown to white	ST. PETER FORMATION	100/0.4		12	SS				
			100/0.15		-	--				
			100/0.15		-	--				
	#1 - silty sand and sandy clay (SP-SM)		100/0.15		-	--				
	#2 - action of drilling equipment and on evidence of material returned in drilling fluid.									
98.65	End of Boring		100/0.15		-	--				

R - percent core recovery. ()indicates RQD.

*No measurement recorded due to presence of drilling/coring fluid.

START 1-19-79 COMPLETE 1-20-79

METHOD 3¼ HSA 0' - 14½' @ 10:30

DM 14½'-45.6', BWC 0'-45.6',

BX diamond bit-cored 45.6'-77.7',

DM 77.7'-98½'

CREW CHIEF Holan

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
1-19		16'	14½'		to	None
1-20	10:30	98.65'	45.6'		to	*
1-20	11:15	98.65'	None		to	*
					to	

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LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO 2

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL — SURFACE ELEVATION 836.3' (126.0')	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL/PL	Qu
	FILL, mixture of SAND and SILTY SAND, a little gravel, concrete and brick, brown, dark brown and black, frozen to 1½'	FILL			1	HSA				
			17		2	SS				
			30		3	SS				
			12		4	SS				
9	SILTY SAND, some gravel, a few cobbles, brown, moist, very dense, a few lenses of clayey sand (SM)	TILL	47		5	SS				
					6	SS				
12½	SILTY SAND, a little gravel, a few cobbles and boulders, brown, moist, very dense, a few lenses of sand above 17' (SM)		45							
			37		7	SS				
			100/0.7		8	SS				
			100/0.6		9	SS	12	127		M.A.
			78		10	SS				
35	Continued on next page									

LOG OF TEST BORING

JOB NO 120-4131 VERTICAL SCALE 1" = 4' BORING NO 2 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LAB TESTS W	LAB TESTS D	LAB TESTS LL/PL	LAB TESTS Qu
35	SILTY SAND (Cont.)		54		11	SS	9	129		M.A.
			40		12	SS				
43±	LIMESTONE, gray to about 44.3' then light brownish gray with a few lenses of brown to about 55' then gray, weathered above about 44'	SEE NOTE 1:	95%	(59%)		NQ				
		Magnolia Member	92%	(60%)		NQ				
			92%	(61%)		NQ				
		SEE NOTE 2:								
55.9	End of Boring									

R - percent core recovery. () indicates RQD.

*No measurement recorded due to presence of drilling/coring fluid.

**Piezometer installed in boring - see attached illustration/data sheet.

NOTE 1: PLATTEVILLE FORMATION Carimona Member

NOTE 2: Hidden Falls Member

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
					to	
1-17	4:15	55.9'	43.8'		to	*
1-17	4:45		**		to	
					to	

START 1-10-79 COMPLETE 1-17-79

METHOD 3¼ HSA 0'-7', @ 4:15

4C 0'-9½', DM 8½'-43.9', NWC 0'-43.8',

NQ wireline-cored 43.9'-55.9'

CREW CHIEF LeMay

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO 3

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 836.3' (126.0'))	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	F	Qu
	FILL, mixture of SAND and SILTY SAND, a little gravel and cinders, dark brown, brown and gray, frozen to ½'	FILL			1	HSA				
			21		2	SS				
					3	SS				
5			16		4	SS				
	SAND, medium grained, a little gravel, light brown, moist, dense to medium dense, a few lenses of silt above 7' (SP)	COARSE ALLUVIUM								
			9		5	SS				
9½	SILTY SAND, a little gravel, a few cobbles and boulders, brown to grayish brown, moist, very dense to dense (SM)	TILL	30		6	SS				
			34		7	SS				
			31		8	SS				
			47		9	SS				
			23		10	SS				
30	Continued on next page									

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO 3 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	or N R	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	$\frac{L}{F}$	Qu
30	SILTY SAND (Cont.)		90		11	SS				
			24		12	SS				
			19		-	--				
43½±	LIMESTONE, light brownish gray to about 53' then gray to about 59' then light gray and gray mottled, a 0.1' weathered seam at about 53', weathered above about 45.2'	PLATTEVILLE FORMATION Magnolia Member	50/0.0		-	--				10,240 psi
			94%		(74%)	NQ				
			100%		(0%)	NQ				
			100%		(96%)	NQ				
		Hidden Falls Member	95%		(82%)	NQ				
			96%		(88%)	NQ				
60	Continued on next page									

LOG OF TEST BORING

JOB NO 120-4131 VERTICAL SCALE 1" = 4' BORING NO 3 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LAB TESTS W	D	LL/PL	Qu
60	LIMESTONE (Cont.)	Mifflin Member (Cont.)	100%	(95%)		NQ				
			99%	(95%)		NQ				
			100%	(64%)		NQ				
		Pecatonica Member								
73.8±	SHALE, gray to about 76' then light gray and gray mottled with a little brown, shaly sandstone below about 76'	GLENWOOD FORMATION	100%	(45%)		NQ				
77½±	SANDSTONE, brown to white	ST. PETER FORMATION	46%	(8%)		NQ				
			0%	(0%)		NQ				
			14%	(0%)		NQ				
90	Continued on next page									

LOG OF TEST BORING

JOB NO 120-4131 VERTICAL SCALE 1" = 4' BORING NO 3 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	or N R	WL	SAMPLE NO	SAMPLE TYPE	LAB TESTS W	D	LL/PL	Qu
90	SANDSTONE (Cont.)									
			6%			NQ				
			0%			NQ				
100.8	End of Boring									

R = percent core recovery. () indicates RQD.

*Appears to be drilling/coring fluid.

Note: Samples No. 3 and 8 contain petroleum fuel odor.

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
1-6	10:40	11'	None	10½'	to	None
1-9	9:15	52.9'	47.0'		to	47½'*
1-9	3:30	100.8'	47.0'		to	47½'*
1-10	8:25	100.8'	None	45'	to	41½'*

START 1-6-79 COMPLETE 1-9-79

METHOD 6 FA 0'-9', 4C 0'-9½' @ 3:00

DM 11'-45.2', NC 0'-47.0',

NQ wireline-cored 45.2'-100.8'

CREW CHIEF LeMay & Francis

662 CROMWELL AVENUE SOIL EXPLORATION COMPANY ST PAUL, MN 55114

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO 5

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 842.2' (131.9'))	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LAB TESTS W	D	L/PL	Qu
	FILL, mostly SILTY SAND, a little gravel, brown, frozen	FILL			1	HSA				
2	SAND, fine grained, brown, frozen to 5½' then moist, loose (SP)	COARSE ALLUVIUM			2	HSA				
					3	SS				
			6		4	SS				
9	SAND, medium to fine grained, light brown, moist, loose, a few lenses of silty sand (SP)		6		5	SS				
12	SAND, fine grained, light brown, moist, medium dense (SP)		9		6	SS				
14	SAND, medium grained, a little gravel, brown, moist, loose to dense (SP)		8		7	SS				
			22		8	SS				
23	SANDY CLAY, a little gravel, gray, stiff (CL)	TILL	18		9	SS				
28	SILTY SAND, a little gravel, a few cobbles and boulders, brownish gray, moist, medium dense (SM)									
30	Continued on next page									

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO. 5 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	Qu
			15		10	SS			
30	SILTY SAND (Cont.)								
34	SAND, medium grained, some gravel, a few cobbles and boulders, brown, moist, dense (SP-SM)	COARSE ALLUVIUM	25		11	SS			
40	SILTY SAND, a little gravel, a few cobbles and boulders, brown, moist, medium dense to dense (SM)	TILL	9		12	SS			
			100/0.5		-	--			
48½±	LIMESTONE, gray to about 50' then light brownish gray with a few lenses of brown to about 59½' then gray to about 64½' then light gray and gray mottled	PLATTEVILLE FORMATION (See Note:) Magnolia Member	97%		(63%)	BX			
			100%		(93%)	BX			
			96%		(73%)	BX			
60	Continued on next page								

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO 5 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL	Qu
60	LIMESTONE (Cont.)	Hidden Falls Member	96%	(73%)		BX				
			100%	(83%)		BX				
		Mifflin Member	100%	(78%)		BX				
			100%	(87%)		BX				
		Pecatonica Member								
79±	SHALE, gray to about 81' then greenish gray and a little brown, shaly sandstone below about 81'	GLENWOOD FORMATION	86%	(44%)		BX				
83±	SANDSTONE, brown and a little gray mottled to white	ST. PETER FORMATION	100/0.4		13	SS				
			100/0.2		14	SS				
90	Continued on next page									

LOG OF TEST BORING

JOB NO 120-4131 VERTICAL SCALE 1" = 4' BORING NO 5 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	or N R	W%	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL/PL	Qu
90	SANDSTONE (Cont.)									
			100/0.15		-	--				
			100/0.2		-	--				
103.7			100/0.2		-	--				
	End of Boring									
	*No measurement recorded due to presence of drilling/coring fluid.	Note: Carimona Member								

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
1-22		16'	14½'		to	None
1-23	11:00	103.7'	48.9'		to	*
1-23	12:00	103.7'	None		to	*
					to	

START 1-22-79 COMPLETE 1-23-79

METHOD 3¼ HSA 0' - 14½' @ 11:00

DM 14½'-48.9', BWC 0'-48.9',

BX diamond bit-cored 48.9'-82.8',

DM 82.8'-103½'

CREW CHIEF Holan

662 CROMWELL AVENUE SOIL EXPLORATION COMPANY ST PAUL, MN 55114

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO 6

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 841.8' (131.5'))	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LAB TESTS W	LAB TESTS D	LAB TESTS -200	LAB TESTS Qu
	FILL, mixture of SILTY SAND, SANDY CLAY and CONCRETE, a little gravel, a few boulders, brown and black, frozen to 3'	FILL			1	HSA				
					2	HSA				
9	LEAN CLAY, grayish brown, medium (CL)	FINE ALLUVIUM	14		3	SS	28	91	37/14	
10½	SAND, fine grained, light brown, moist, medium dense (SP)	COARSE ALLUVIUM	13		4	SS				
14	SAND, medium grained, light brown to brown, moist, medium dense (SP)		10		5	SS				
17½	SILTY SAND, medium grained, some gravel, a few cobbles and boulders, brown, moist, dense to very dense, a few lenses of sandy clay and sand (SM)		25		-	--				
			32		6	SS				
28	SILTY SAND, fine to medium grained, a little gravel, a few cobbles, grayish brown, moist, dense (SM)		16		7	SS				
33	SAND, medium grained, a little gravel, a few cobbles, grayish brown, moist, dense, some lenses of gray									
35	Continued on next page									

LOG OF TEST BORING

JOB NO 120-4131 VERTICAL SCALE 1" = 4' BORING NO 6 Cont

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LAB TESTS W	D	LL/PL	Qu
35	SAND (Cont.), sandy clay (SP-SM)		24		8	SS				
38	CLAYEY SAND, a little gravel, a few cobbles, gray, rather stiff, lenses of silty sand, a few lenses of sandy clay and sand (SC)	TILL	14		9	SS				
42	SILTY SAND, a little gravel, a few cobbles and boulders, brown, moist, very dense, a few lenses of sand (SM)		107		10	SS				
48.3±	LIMESTONE, gray to about 49½' then light brownish gray, with a few lenses of brown	SEE NOTE: Magnolia Member	92%		(75%)	BX				
			96%		(85%)	BX				
58.8	End of Boring									

R = percent core recovery. () indicates RQD.

*No measurement recorded due to presence of drilling/coring fluid.

NOTE: PLATTEVILLE FORMATION Carimona Member

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
1-12		21'	19½'		to	None
1-12	3:45	58.8'	48.8'		to	*
1-13	9:00	58.8'	None		to	*
					to	

START 1-12-79 COMPLETE 1-12-79

METHOD 3¼ HSA 0' - 19½', @ 3:45

DM 19½'-48.8', BWC 0'-48.8',

BX diamond bit-cored 48.8'-58.8'

CREW CHIEF Holan

662 CROMWELL AVENUE SOIL EXPLORATION COMPANY ST PAUL, MN 55114

SE-2 (77-B) 4

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO 7

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 847.0' (136.7'))	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	Qu
	FILL, mixture of SILTY SAND (See#1)	FILL			1	FA			
1	CLAYEY SAND, a little gravel, black, frozen (SC) (may be fill)	TOPSOIL or MAY BE FILL			2	FA			
2½	SILTY SAND, fine grained, a trace of gravel, dark brown to brown, (See#2)	COARSE ALLUVIUM			3	FA			
4	CLAYEY SAND, a little gravel, brown, medium, lenses of silty sand (SC-SM)	TILL	8		4	SS			
					5	SS			
7	SILTY SAND, a little gravel, a few cobbles, boulders and slabs of limestone, brown, moist, very dense, a few lenses of sandy clay (SM)		47		6	SS			
			61		-	--			
			50/0.1		7	SS			
13	SILTY SAND, a little gravel, a few cobbles, brown, moist, dense (SM)		43		8	SS			
18	SAND, medium to coarse grained, some gravel, brown, moist, very dense (SP-SM)	COARSE ALLUVIUM	53		9	SS			
24	SAND, fine grained, brown, moist, very dense (SP-SM)		39		10	SS			
28	SAND, medium to fine grained, a little to some gravel, light brown, moist, very dense (SP)								
30	Continued on next page								

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO. 7 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	or ^{N}R	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL / PL	Qu
30	SAND (Cont.)		56		11	SS				
32	SILTY SAND, some gravel, a few cobbles, brown, moist, very dense (SM)	TILL	100/0.65		12	SS				
			100/0.5		13	SS				
43	SAND, fine grained, brown, moist, very dense (SP)	COARSE ALLUVIUM	100/0.55		14	SS				
48	SAND, medium grained, with gravel, cobbles and a few boulders, brown, moist, very dense (SP-SM)		100/0.45		15	SS				
53½	No sample recovered. Appears to be LIMESTONE SLABS or BOULDERS, (See#3)									
55±	LIMESTONE, light brownish gray to about 63½' then gray to about 68½' then light gray and gray mottled, contains a lense of gray shale at about 64.7' and at about 66½'	PLATTEVILLE FORMATION Magnolia Member	99% (85%)	▼		NQ				12,820 psi
60	Continued on next page									

662 CROMWELL AVENUE SOIL EXPLORATION COMPANY ST PAUL, MN 55114

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO 7 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	RQD or N R	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	Qu
60	LIMESTONE (Cont.)	PLATTEVILLE FORMATION (Cont.)	100%	(100%)		NQ			
		Hidden Falls Member	100%	(100%)		NQ			
			100%	(100%)		NQ			
			98%	(94%)		NQ			
		Mifflin Member	100%	(81%)		NQ			
			100%	(96%)		NQ			
		Pecatonica Member							
83±	SHALE, gray to about 85½' then greenish gray and some light brown	GLENWOOD FORMATION	96%	(81%)		NQ			
87½±	SANDSTONE, tan to white	ST. PETER FORMATION	14%	(14%)		NQ			
90									

Continued on next page

LOG OF TEST BORING

JOB NO 120-4131 VERTICAL SCALE 1" = 4' BORING NO 7 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LAB TESTS W	D	LL/PL	Qu
90	SANDSTONE (Cont.)		100/0.05		16	SS				
			100/0.15		-	--				
			100/0.05		-	--				
			100/0.1		-	--				
110.1			100/0.1		-	--				
	End of Boring									
	#1 - and CRUSHED LIMESTONE, black, tan and dark brown, frozen, a layer of blacktop at the surface									
	#2 - frozen to 3' then moist (SM)									
	#3 - based on action of drilling equipment.									
	R - percent core recovery. () indicates RQD.									

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
1-13		9'	None		to	None
1-17	9:05	110.1'	54.4'		to	58'
					to	
					to	

START 1-13-79 COMPLETE 1-16-79

METHOD 6 FA 0'-7', 4C 0'-8', @ 4:25

DM 9'-54.4', NWC 0'-54.4', JW 54.4'-55.8', NQ wireline-cored 55.8'-91.0', DM 91'-110'

CREW CHIEF LeMay

662 CROMWELL AVENUE SOIL EXPLORATION ST PAUL, MN 55114

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO. 8

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 841.4' (131.1'))	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	Qu
2	FILL, mixture of SILTY SAND, SAND and SILTY CLAY, a little gravel, brown, frozen to 1'	FILL			1	HSA			
5	SANDY GRAVEL, a few cobbles and boulders, brown, moist, very dense (GP-GM)	COARSE ALLUVIUM			2	HSA			
	SAND, medium grained, some gravel, cobbles and boulders, brown, moist, very dense (SP)		31		-	--			
			46		3	SS			
11			40/0.5		4	SS			
	SILTY SAND, a little gravel, a few cobbles and boulders, brown, moist, very dense (SM)	TILL	50		5	SS			
					6	SS			
			60/0.5		7	SS			
			84		8	SS			
28									
30	SAND, fine to medium grained, a little gravel, brown, moist, very dense (SP-SM)	COARSE ALLUVIUM							

Continued on next page

LOG OF TEST BORING

JOB NO 120-4131 VERTICAL SCALE 1" = 4' BORING NO 8 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	or N R	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL/PL	Qu
30	SAND (Cont.)		114		9	SS				
34	SAND, coarse grained, with gravel and cobbles, brown, moist, very dense (SP-SM)		100/0.5 = 100%		10	SS				
39½	SILTY SAND, a little gravel, brown, moist, very dense, some lenses of sand (SM)		64/0.5		11	SS				
			100/0.0		-	--				
47.5±	LIMESTONE, gray to about 48' then light brownish gray	SEE NOTE: Magnolia Member	96%	(58%)		BX				
			100%	(54%)		BX				
57.5	End of Boring									

R - percent core recovery. () indicates RQD.
*No measurement recorded due to presence of drilling/coring fluid.

NOTE: PLATTEVILLE FORMATION Carimona Member

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
1-18		16'	14½'		to	None
1-18	3:40	57.5'	47.5'		to	*
1-18	4:05	57.5'	None		to	*
					to	

START 1-18-79 COMPLETE 1-18-79

METHOD 3¼ HSA 0' - 14½' @ 3:40

DM 14½'-47½', BWC 0'-47.5', BX diamond bit-cored 38.8'-39.1' and 47.5'-57.5'

CREW CHIEF Holan

662 CROMWELL AVENUE SOIL EXPLORATION COMPANY ST PAUL, MN 55114

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO 9

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 840.1' (129.8'))	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LAB W	LAB D	LAB -200	LAB Qu
	FILL, mostly SILTY SAND, a little gravel, a trace of glass, (See#1)	FILL			1	HSA				
1½	SILTY SAND, a little gravel, a few cobbles, brown, moist, very dense, a few lenses of sand (SM)	TILL	30/0.5		2	SS				
			45		3	SS				
7	SILTY SAND, fine grained, a little gravel, brown, moist, dense (SM-SP)	COARSE ALLUVIUM	21		4	SS				
9	SANDY CLAY, a little gravel, (See#2)	TILL			5	SS				
10	SILTY SAND, a little gravel, (See#3)		22		6	SS				
10½	SAND, fine grained, a trace (See#4)	SEE NOTE:			7	SS				
11½	SILTY SAND, a little gravel, brown, moist, very dense (SM)	TILL	33		8	SS				
14	SANDY CLAY, some gravel, a few cobbles, brown, very stiff (CL-SC)		53		9	SS	10	129	22/12	
17	SAND, fine to medium grained, a little gravel, some layers of gravel, a few cobbles, brown, moist, very dense, a few lenses of silty sand (SP-SM)	COARSE ALLUVIUM	100/0.8		10	SS				
20½					11	SS				
	SILTY SAND, some gravel, a few cobbles, brown, moist, very dense (SM)	TILL	100/0.9		12	SS	7	134		M.A.
30	Continued on next page									

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO 9 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	or ^{N}R	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D		Qu
30	SILTY SAND (Cont.)		100/0.7		13	SS				
			100/0.2		14	SS				
38	SAND, medium grained, some gravel, a few cobbles, brown, moist, very dense (SP-SM)	COARSE ALLUVIUM	100/0.4		15	SS				M.A.
43½	SILTY SAND, some gravel, a few cobbles, grayish brown, moist, very dense (SM)	TILL	112/0.5		16	SS				
45½±	LIMESTONE, light brownish gray to about 56' then gray to about 61.3' then light gray and gray mottled, weathered above about 47.2'	PLATTEVILLE FORMATION								
		Magnolia Member	97%	(64%)		NQ				10,420 psi
			96%	(85%)		NQ				
		Hidden Falls Member	100%	(76%)		NQ				
60	Continued on next page									

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO 9 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	or N R	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D		Qu
60	LIMESTONE (Cont.)	Mifflin Member	100%		(81%)	NQ				
			100%		(87%)	NQ				
			100%		(89%)	NQ				
		Pecatonica Member								
76±	SHALE, gray to about 77.7' then gray and greenish gray, shaly sandstone below about 77.7'	GLENWOOD FORMATION	91%		(75%)	NQ				
			56%		(0%)	NQ				
80½±	SANDSTONE, light gray to white and tan	ST. PETER FORMATION	16%		(0%)	NQ				
			0%		(0%)	NQ				
90	Continued on next page									

LOG OF TEST BORING

JOB NO 120-4131 VERTICAL SCALE 1" = 4' BORING NO 9 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL/PL	Qu
90	SANDSTONE (Cont.)		0%	(0%)		NQ				
			18%	(0%)		NQ				
100.5	End of Boring									
	#1 - black and dark brown, frozen	NOTE: COARSE ALLUVIUM								
	#2 - brown mottled, medium (CL)									
	#3 - brown, moist, dense, a few lenses of sand (SM)									
	#4 - of gravel, light brown, moist, dense (SP-SM)									
	R = percent core recovery. () *indicates RQD. *Influenced by drilling fluid.									

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
1-4	1:45	46.5'	46.3'		to	46'*
1-5	4:15	100.5'	47.0'		to	50'*
1-8	8:50	100.5'	None	99½'	to	51½'
1-12	11:15	100.5'	None		to	52'
1-19	12:00	100.5'	None		to	52'
					to	
					to	
					to	

START 1-3-79 COMPLETE 1-5-79

METHOD 3¼ HSA 0' - 12', @ 4:00

4C 0'-10½', DM 13½'-46.2',

NC 0'-47.0', JW 46.2'-47.2',

NQ wireline-cored 47.2'-100.5'

CREW CHIEF LeMay

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO 10

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL — SURFACE ELEVATION 839.9'(129.6')	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL	Qu
	FILL, mixture of SAND and SILTY SAND, a little gravel and limestone, brown and dark grayish brown, frozen to 2'	FILL	25/0.3		1	HSA				
					2	SS				
			5		3	SS				
			4		4	SS				
			26		5	SS				
12	FILL, mostly ASHES, gray and black		1/4½'		6	SS				
18	FILL, mixture of CLAYEY SAND and SILTY SAND, a trace of gravel, wood and concrete, dark brown and brown		39		7	SS				
22	SANDY CLAY, a little gravel, brown, rather stiff (CL)	TILL	31*		8	SS				
29½	SAND, medium grained, a little gravel,									
30	Continued on next page									

LOG OF TEST BORING

JOB NO 120-4131 VERTICAL SCALE 1" = 4' BORING NO 10 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LAB TESTS W	D	LL/PL	Qu
30	SAND (Cont.), light brown, moist, dense to very dense (SP)	COARSE ALLUVIUM	17		9	SS				
			36		10	SS				
37½	SILTY SAND, a little gravel, a few cobbles and boulders, grayish brown, wet, medium dense (SM)	TILL	13		11	SS				
43½	Poor sample recovery. Appears to be mostly GRAVEL and COBBLES		33%			BX				
45.5	End of Boring (See Note)									

R = percent core recovery

*High blow count appears to be due to encounter of pieces of coarse gravel.

**No measurement recorded due to presence of drilling fluid.

Note: Boring terminated upon unsuccessful attempt in advancing of BW casing through HSA casing due to deflection of HSA casing by boulders. Then moved 3' west for several attempts and advanced boring by spinning down BW casing with drilling mud. This attempt was obstructed and therefore terminated at depth of 43.6' upon encountering boulders below depth of 41½'

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
1-10		44'	44'		to	None
1-10	11:50	45.5'	44'		to	**
1-10	4:00	45.5'	None		to	**
					to	

START 1-10-79 COMPLETE 1-11-79

METHOD 3¼ HSA 0' - 44' @ 4:40

BX diamond bit-cored 44.0'-45.5'

BWC 0'-43.6'

CREW CHIEF Hagedorn

LOG OF TEST BORING

JOB NO 120-4131 VERTICAL SCALE 1" = 4' BORING NO 10-A

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL SURFACE ELEVATION 839.9' (129.6')	GEOLOGIC ORIGIN	N	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL/PL	Qu
	No samples taken.									
34½	SILTY SAND, some gravel and cobbles, a few boulders, brownish gray, moist, dense (SM)	TILL	50/0.3		1	SS				
39	End of Boring (See Note)									

Note: Boring terminated upon unsuccessful attempt in retrieval of drilling equipment broken off by cobbles and boulders. Then moved to boring No. 10-B.

Lost drilling equipment consisted of 3 7/8" tricone bit, adaptor, 2' section of "NW" drill rod and "NW casing.

*No measurement recorded due to presence of drilling fluid.

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
					10	
1-19	9:30	39'	9½'		10	*
1-19	10:00	39'	None		10	*
					10	

START 1-18-79 COMPLETE 1-19-79

METHOD 6 FA 0' - 9½' @ 9:30

4C 0' - 9½'

DM 9½' - 39'

CREW CHIEF LeMay

642 CROMWELL AVENUE SOIL EXPLORATION COMPANY ST PAUL, MN 55114

LOG OF TEST BORING

JOB NO 120-4131 VERTICAL SCALE 1" = 4' BORING NO 10-B

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION 839.9' (129.6'))	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LABORATORY TESTS W	D	LL/PL	Qu
	No samples taken. Appears to be numerous cobbles, boulders and gravel below 30' and some cobbles and boulders above 30' based on action of drilling equipment									
40½	SAND, fine grained, a trace of gravel, brown, moist, very dense (SP)	COARSE ALLUVIUM	100/0.45		1	SS				
42½	No sample recovered. Appears to be BOULDERS, COBBLES, GRAVEL and (See#1)	MAY BE SEE NOTE:								
44	SANDY CLAY, a little gravel, some cobbles, gray, very stiff (CL)	TILL	100/0.5		2	SS				
46.0±	LIMESTONE, light brownish gray with a few lenses of brown to about 56' then gray, a thin lense of shale at about 52.4'	PLATTEVILLE FORMATION Magnolia Member	98%	(79%)		NQ				
			100%	(96%)		NQ				
			93%	(59%)		NQ				
		Hidden Falls Member	85%	(30%)		NQ				
58.0	End of Boring									

#1 - SAND based on action of drilling equipment.

R - percent core recovery. () indicates RQD.

*Piezometer installed in boring - see attached illustration/data sheet.

NOTE: COARSE ALLUVIUM

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
					to	
1-22	11:15	58'	46'		to	52½'
1-22	12:45		*		to	
					to	

START 1-19-79 COMPLETE 1-22-79

METHOD 6 FA 0'-9½', 4C 0'-9½' @ 11:00

DM 9½'-46.5', NWC 0'-46.0'

NQ wireline-cored 46.5'-58.0'

CREW CHIEF LeMay

662 CROMWELL AVENUE SOIL EXPLORATION COMPANY ST PAUL, MN 55114

SE 2 (77-B) 4

LOG OF TEST BORING

JOB NO. 120-4131 VERTICAL SCALE 1" = 4' BORING NO 11

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL — SURFACE ELEVATION 837.7' (127.4')	GEOLOGIC ORIGIN	qT^N R	WL	SAMPLE NO	SAMPLE TYPE	LAB TESTS W	D	LL/PI	Qu
1½	FILL, mixture of SILTY SAND, CONCRETE and BOULDERS, brown, frozen	FILL			1	HSA	-			
	SILTY SAND, a little gravel, brown, moist, dense (SM)	TILL	25		2	SS				
7	SILTY SAND, medium to fine grained, some gravel, brown, moist, dense to very dense (SM-SP)		22		3	SS				
			52		4	SS				
12	SILTY SAND, a little gravel, brown, moist, dense (SM)		25		5	SS				
15	SAND, fine to medium grained, a little gravel, a few cobbles, brown, moist, very dense (SP-SM)	COARSE ALLUVIUM	51		6	SS				
19	SILTY SAND, some gravel, a few cobbles and boulders, brown, moist, very dense (SM)	TILL	125		7	SS				
			100/0.0		-	--				
			100/0.9		8	SS				
30	Continued on next page									

LOG OF TEST BORING

JOB NO 120-4131 VERTICAL SCALE 1" = 4' BORING NO. 11 Cont.

PROJECT PROPOSED SPORTS STADIUM - MINNEAPOLIS, MN

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N or R	WL	SAMPLE NO	SAMPLE TYPE	LAB TESTS W	D	LL/PL	Qu
30	SILTY SAND (Cont.)		100/0.0		-	--				
			100/0.4		-	--				
44.0±	LIMESTONE, light brownish gray to about 53' then gray, weathered above about 45.2'	PLATTEVILLE FORMATION Magnolia Member	100%		(93½%)	BX				
		Hidden Falls Member	100%		(66%)	BX				
55.2	End of Boring									

R = percent core recovery. () indicates RQD.
*No measurement recorded due to presence of drilling/coring fluid.

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
1-4		16'	14½'		10	None
1-5	1:00	55.2'	45.2'		10	*
1-5	1:30	55.2'	None		10	*
					10	

START 1-4-79 COMPLETE 1-5-79

METHOD 3¼ HSA 0' - 18' @ 1:00

DM 14½' - 45.2', BWC 0' - 45.2'

BX diamond bit-cored 45.2'-55.2'

CREW CHIEF Holan

662 CROMWELL AVENUE SOIL EXPLORATION COMPANY ST PAUL, MN 55114

SE-2 (77-B)-4

The Peoples Stadium
900 South 5th Street
Minneapolis, MN 55415

Inquiry Number: 03540142.1r
March 11, 2013

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

900 SOUTH 5TH STREET
MINNEAPOLIS, MN 55415

COORDINATES

Latitude (North):	44.9728000 - 44° 58' 22.08''
Longitude (West):	93.2591000 - 93° 15' 32.76''
Universal Tranverse Mercator:	Zone 15
UTM X (Meters):	479568.7
UTM Y (Meters):	4979744.5
Elevation:	840 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	44093-H3 MINNEAPOLIS SOUTH, MN
Most Recent Revision:	1993
East Map:	44093-H2 SAINT PAUL WEST, MN
Most Recent Revision:	1993

AERIAL PHOTOGRAPHY IN THIS REPORT

Photo Year:	2010
Source:	USDA

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 7 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
XCEL - PAD MOUNT TRANSFORMER 900 SOUTH 5TH STREET MINNEAPOLIS, MN	SPILLS Spill Closure: Response Completed Financial Assurance	N/A
HHH METRODOME 900 S 5TH ST MINNEAPOLIS, MN 55415	RCRA-SQG FINDS	MND982642522
H H H METRODOME 900 S 5TH ST MINNEAPOLIS, MN 55415	UST WIMN Financial Assurance	N/A

EXECUTIVE SUMMARY

FUJI PHOTO FILM USA INC - HHH MET
900 S 5TH ST
MINNEAPOLIS, MN 55415

RCRA NonGen / NLR

MNR000103614

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

CERCLIS ---------- Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY ---------- Federal Facility Site Information listing

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal institutional controls / engineering controls registries

US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls
LUCIS ---------- Land Use Control Information System

State- and tribal - equivalent NPL

MN PLP ---------- Permanent List of Priorities

State- and tribal - equivalent CERCLIS

SHWS ---------- Superfund Site Information Listing

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ---------- Permitted Solid Waste Disposal Facilities

LCP Closed Landfills Priority List
UNPERM LF Unpermitted Facilities

State and tribal leaking storage tank lists

INDIAN LUST Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

INDIAN UST Underground Storage Tanks on Indian Land
FEMA UST Underground Storage Tank Listing

State and tribal institutional control / engineering control registries

INST CONTROL Site Remediation Section Database

State and tribal voluntary cleanup sites

INDIAN VCP Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS Petroleum Brownfields Program Sites

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9 Torres Martinez Reservation Illegal Dump Site Locations
ODI Open Dump Inventory
SWRCY Recycling Facilities
INDIAN ODI Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL Clandestine Drug Labs
MN DEL PLP Delisted Permanent List of Priorities
CDL Clandestine Drug Labs
US HIST CDL National Clandestine Laboratory Register

Local Land Records

LIENS 2 CERCLA Lien Information
LIENS Environmental Liens

Records of Emergency Release Reports

HMIRS Hazardous Materials Information Reporting System
AGSPILLS Department of Agriculture Spills

Other Ascertainable Records

DOT OPS Incident and Accident Data

DOD	Department of Defense Sites
FUDS	Formerly Used Defense Sites
CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
UMTRA	Uranium Mill Tailings Sites
US MINES	Mines Master Index File
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
RADINFO	Radiation Information Database
RAATS	RCRA Administrative Action Tracking System
RMP	Risk Management Plans
BULK	Bulk Facilities Database
DRYCLEANERS	Registered Drycleaning Facilities
MN HWS Permit	Active TSD Facilities
INDIAN RESERV	Indian Reservations
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
PRP	Potentially Responsible Parties
MDA LIS	Licensing Information System Database Listing
2020 COR ACTION	2020 Corrective Action Program List
EPA WATCH LIST	EPA WATCH LIST
US FIN ASSUR	Financial Assurance Information
PCB TRANSFORMER	PCB Transformer Registration Database
COAL ASH	Coal Ash Disposal Site Listing
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
AGVIC	Agricultural Voluntary Investigation & Cleanup Listing

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	EDR Proprietary Manufactured Gas Plants

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS NFRAP site List

CERC-NFRAP: Archived sites are sites that have been removed and archived from the inventory of CERCLIS

sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

A review of the CERC-NFRAP list, as provided by EDR, and dated 11/02/2012 has revealed that there is 1 CERC-NFRAP site within approximately 0.125 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
MINNEAPOLIS STAR & TRIBUNE PRI	***PLYMOUTH AVE & 1ST ST N***	***NNW 0 - 1/8 (0.079 mi.)***	***U226***	***612***

Federal RCRA generators list

RCRA-LQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

A review of the RCRA-LQG list, as provided by EDR, and dated 02/12/2013 has revealed that there are 3 RCRA-LQG sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
HENNEPIN COUNTY MEDICAL CENTER	***701 PARK AVENUE***	***W 0 - 1/8 (0.113 mi.)***	***AG293***	***767***

Lower Elevation	Address	Direction / Distance	Map ID	Page
VALSPAR APPLIED SCIENCE & TECH	1101 S 3RD ST	ENE 0 - 1/8 (0.066 mi.)	S195	517
VALSPAR CORPORATION (THE)	***312 S 11TH AVE***	***ENE 0 - 1/8 (0.066 mi.)***	***S196***	***518***

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 02/12/2013 has revealed that there are 4 RCRA-SQG sites within approximately 0.125 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SAMUEL BINGHAM CO	***900 S. 3RD ST.***	***NNE 0 - 1/8 (0.005 mi.)***	***B147***	***375***
VALSPAR CORP INDUSTRIAL LAB	***1014 S 3RD ST***	***NE 0 - 1/8 (0.029 mi.)***	***N158***	***394***
MCWHORTER TECHNOLOGIES	1028 S 3RD ST	NE 0 - 1/8 (0.034 mi.)	O162	401
VALSPAR ECOAT LAB	***1028 S 3RD ST***	***NE 0 - 1/8 (0.034 mi.)***	***O164***	***407***

EXECUTIVE SUMMARY

RCRA-CESQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

A review of the RCRA-CESQG list, as provided by EDR, and dated 02/12/2013 has revealed that there are 14 RCRA-CESQG sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
HENNEPIN COUNTY CRIME LAB UNIT	***531 PARK AVE S***	***0 - 1/8 (0.000 mi.)***	***F93***	***122***
HENNEPIN COUNTY JUVENILE DETEN	***626 S 6TH ST RM C20***	***WNW 0 - 1/8 (0.067 mi.)***	***V200***	***545***
RED DOOR CLINIC HENNEPIN CO CO	***525 PORTLAND AVE STE LL***	***NW 0 - 1/8 (0.078 mi.)***	***X213***	***566***
HENNEPIN COUNTY HEALTH SERVICE	***525 PORTLAND AVE STE MC***	***NW 0 - 1/8 (0.078 mi.)***	***X214***	***568***
MASTERWORKS OF MINNEAPOLIS INC	***1121 7TH ST S***	***SE 0 - 1/8 (0.094 mi.)***	***AE254***	***665***
DOUGLAS CORP - MPLS	***620 12TH AVE S***	***SE 0 - 1/8 (0.098 mi.)***	***AE269***	***688***
HENNEPIN COUNTY PUB SERV MINNE	***7TH AND PARK AVE S***	***W 0 - 1/8 (0.110 mi.)***	***AG285***	***737***

Lower Elevation	Address	Direction / Distance	Map ID	Page
STAR TRIBUNE	***716 S 4TH ST***	***0 - 1/8 (0.000 mi.)***	***C41***	***48***
GRAINGER INDUSTRIAL SUPPLY - M	***724 3RD ST S***	***N 0 - 1/8 (0.002 mi.)***	***D110***	***145***
JOHNSTECH INTERNATIONAL - MPLS	***511 11TH AVE S***	***ESE 0 - 1/8 (0.004 mi.)***	***I127***	***205***
HENNEPIN COUNTY ENERGY CENTER	***600 10TH AVE S***	***SE 0 - 1/8 (0.004 mi.)***	***K141***	***309***
MINNEAPOLIS STAR & TRIBUNE PRI	***PLYMOUTH AVE & 1ST ST N***	***NNW 0 - 1/8 (0.079 mi.)***	***U226***	***612***
PERISCOPE INC	***921 WASHINGTON AVE S***	***NE 0 - 1/8 (0.080 mi.)***	***AA232***	***621***
GUTHRIE SCENE SHOP	212 9TH AVE S	NNE 0 - 1/8 (0.098 mi.)	AA267	686

Federal ERNS list

ERNS: The Emergency Response Notification System records and stores information on reported releases of oil and hazardous substances. The source of this database is the U.S. EPA.

A review of the ERNS list, as provided by EDR, and dated 12/31/2012 has revealed that there are 6 ERNS sites within approximately 0.125 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	400 PARK AVE	NNW 0 - 1/8 (0.002 mi.)	C100	136
Not reported		NNE 0 - 1/8 (0.046 mi.)	L169	429
Not reported	1112 SOUTH 3RD STREET	ENE 0 - 1/8 (0.072 mi.)	S204	551
Not reported	425 PORTLAND AVE	NNW 0 - 1/8 (0.079 mi.)	U222	583
Not reported	425 PORTLAND AVE	NNW 0 - 1/8 (0.079 mi.)	U223	583
Not reported	1202 S 5TH STREET	ESE 0 - 1/8 (0.094 mi.)	R252	660

State and tribal leaking storage tank lists

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Minnesota Pollution Control Agency's Leak Sites list.

A review of the LUST list, as provided by EDR, and dated 11/01/2012 has revealed that there are 10

LUST sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MCDA SITE	***4TH ST & KIRBY PUCKETT***	***0 - 1/8 (0.000 mi.)***	***C80***	***97***
Complete Site Closed Date: 11/24/2004 00:00:00				
JUVENILE JUSTICE CENTER	***626 S 6TH ST***	***WNW 0 - 1/8 (0.067 mi.)***	***V199***	***535***
Complete Site Closed Date: 07/29/1999 00:00:00				
DEPENDABLE GARAGE	***619 PORTLAND***	***WNW 0 - 1/8 (0.094 mi.)***	***V253***	***661***
Complete Site Closed Date: 03/17/1999 00:00:00				

Lower Elevation	Address	Direction / Distance	Map ID	Page
STAR TRIBUNE PARKING LOT	***701 S 4TH ST***	***0 - 1/8 (0.000 mi.)***	***C66***	***87***
Complete Site Closed Date: 10/15/2007 00:00:00				
AT&T MINNEAPOLIS MN0305	***511 11TH AVE S***	***ESE 0 - 1/8 (0.004 mi.)***	***I135***	***247***
Complete Site Closed Date: 08/18/1995 00:00:00				
HENNEPIN COUNTY ENERGY CENTER	***600 10TH AVE S***	***SE 0 - 1/8 (0.004 mi.)***	***K142***	***319***
Complete Site Closed Date: 10/18/1994 00:00:00				
Complete Site Closed Date: 03/31/1992 00:00:00				
VALSPAR RESEARCH LAB	***312 11TH AVE S***	***ENE 0 - 1/8 (0.059 mi.)***	***S179***	***476***
Complete Site Closed Date: 05/05/2010 00:00:00				
STAR TRIBUNE	***425 PORTLAND AVE S***	***NNW 0 - 1/8 (0.079 mi.)***	***U225***	***584***
Complete Site Closed Date: 05/10/1990 00:00:00				
Complete Site Closed Date: 12/19/1995 00:00:00				
KRELITZ BUILDING	***251 PORTLAND AVE S***	***N 0 - 1/8 (0.087 mi.)***	***T245***	***630***
Complete Site Closed Date: 07/23/2001 00:00:00				
UNIVERSITY BANK BUILDING	***720 WASHINGTON AVE***	***N 0 - 1/8 (0.095 mi.)***	***Q257***	***669***
Complete Site Closed Date: 12/09/1997 00:00:00				

LAST: A listing of leaking aboveground storage tanks.

A review of the LAST list, as provided by EDR, and dated 11/01/2012 has revealed that there is 1 LAST site within approximately 0.125 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
VALSPAR	***1028 S 3RD ST***	***NE 0 - 1/8 (0.034 mi.)***	***O163***	***403***
Complete Site Closed Date: 02/18/2010 00:00:00				

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Minnesota Pollution Control's Underground Storage Tank File.

A review of the UST list, as provided by EDR, and dated 11/01/2012 has revealed that there are 21 UST sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MCGILL BUILDING	***501 PARK AVE***	***0 - 1/8 (0.000 mi.)***	***F85***	***105***

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
EXECUTIVE PARKING LOT - BLOCK	***NW CORNER OF 5TH ST & P***	***0 - 1/8 (0.001 mi.)***	***F96***	***129***
FORSENIC SCIENCE BUILDING	***530 CHICAGO AVE S***	***NW 0 - 1/8 (0.009 mi.)***	***G153***	***383***
HENNEPIN COUNTY MEDICAL CENTER	***626 PARK AVE***	***WNW 0 - 1/8 (0.058 mi.)***	***P178***	***467***
JUVENILE JUSTICE CENTER	***626 S 6TH ST***	***WNW 0 - 1/8 (0.067 mi.)***	***V199***	***535***
ST. BARNABAS	***906 7TH ST S***	***SSW 0 - 1/8 (0.079 mi.)***	***221***	***580***
HOPE COMMUNITY CHURCH	***704 11TH AVE S***	***SSE 0 - 1/8 (0.109 mi.)***	***AC283***	***728***
HENNEPIN COUNTY MEDICAL CENTER	***701 PARK AVE S***	***W 0 - 1/8 (0.113 mi.)***	***AG292***	***752***

Lower Elevation	Address	Direction / Distance	Map ID	Page
FLEET SERVICE GARAGE - BLOCK 7	***716 S 4TH ST***	***0 - 1/8 (0.000 mi.)***	***C34***	***33***
STAR TRIBUNE	***716 S 4TH ST***	***0 - 1/8 (0.000 mi.)***	***C41***	***48***
EAGLE STANDARD	***728 S 4TH ST***	***0 - 1/8 (0.000 mi.)***	***C45***	***59***
TWIN CITY GEAR	***823 25 17TH AVE S***	***0 - 1/8 (0.000 mi.)***	***B51***	***74***
THRESHER SQUARE	***708 S 3RD ST***	***N 0 - 1/8 (0.002 mi.)***	***D113***	***148***
AT&T MINNEAPOLIS MN0305	***511 11TH AVE S***	***ESE 0 - 1/8 (0.004 mi.)***	***I135***	***247***
NRG/HENNEPIN COUNTY ENERGY CEN	***600 10TH AVE S***	***SE 0 - 1/8 (0.004 mi.)***	***K139***	***286***
VALSPAR CORPORATION (THE)	***312 S 11TH AVE***	***ENE 0 - 1/8 (0.066 mi.)***	***S196***	***518***
STAR TRIBUNE	***425 PORTLAND AVE S***	***NNW 0 - 1/8 (0.079 mi.)***	***U225***	***584***
KRELITZ BUILDING	***251 PORTLAND AVE S***	***N 0 - 1/8 (0.087 mi.)***	***T245***	***630***
UNIVERSITY BANK BUILDING	***720 WASHINGTON AVE***	***N 0 - 1/8 (0.095 mi.)***	***Q257***	***669***
GUTHRIE RIVERFRONT PARKING RAM	212 9TH AVE S	NNE 0 - 1/8 (0.098 mi.)	AA264	681
BLEK OIL	***1000 WASHINGTON AVE S***	***NE 0 - 1/8 (0.106 mi.)***	***W277***	***709***

AST: The Aboveground Storage Tank database contains registered ASTs. The data come from the Minnesota Pollution Control's Aboveground Storage Tank File.

A review of the AST list, as provided by EDR, and dated 11/01/2012 has revealed that there are 7 AST sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
FORMER WAREHOUSE	406 CHICAGO	0 - 1/8 (0.000 mi.)	E39	46
METRODOME SQUARE BUILDING	1010 S 7TH ST	SSE 0 - 1/8 (0.079 mi.)	Z217	572

Lower Elevation	Address	Direction / Distance	Map ID	Page
LEVEL 3 MINNEAPOLIS	***511 11TH AVE S STE 210***	***ESE 0 - 1/8 (0.004 mi.)***	***I134***	***243***
AT&T MINNEAPOLIS MN0305	***511 11TH AVE S***	***ESE 0 - 1/8 (0.004 mi.)***	***I135***	***247***
NRG/HENNEPIN COUNTY ENERGY CEN	***600 10TH AVE S***	***SE 0 - 1/8 (0.004 mi.)***	***K139***	***286***
AMERICAN TRIO BUILDING	616 S 3RD ST	NNW 0 - 1/8 (0.065 mi.)	T184	494
STAR TRIBUNE	***425 PORTLAND AVE S***	***NNW 0 - 1/8 (0.079 mi.)***	***U225***	***584***

State and tribal voluntary cleanup sites

VIC: This is the Minnesota Pollution Control Agency's Voluntary Investigation and Cleanup Program list.

A review of the VIC list, as provided by EDR, and dated 01/11/2012 has revealed that there are 6 VIC sites within approximately 0.125 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
NORM MCGREW PLACE	*316 NORM MCGREW PLACE*	*0 - 1/8 (0.000 mi.)*	*B86*	*109*
MINNESOTA BUSINESS & TECH CENT	*511 ELEVENTH AVENUE S.*	*ESE 0 - 1/8 (0.004 mi.)*	*I136*	*269*
NORM MCGREW AND 3RD	*NORM MCGREW AND 3RD*	*NNE 0 - 1/8 (0.005 mi.)*	*B143*	*362*
MINNEAPOLIS ADMINSTRATION SITE	*1101 SOUTH 3RD STREET*	*ENE 0 - 1/8 (0.066 mi.)*	*S191*	*506*
PALMER'S AUTO	*600 5TH STREET NORTH*	*NW 0 - 1/8 (0.078 mi.)*	*X212*	*556*
PARCEL F	*900 WASHINGTON AVENUE S*	*NNE 0 - 1/8 (0.090 mi.)*	*AA247*	*640*

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Hazardous waste / Contaminated Sites

SRS: The database contains site information for sites monitored by the Site Remediation Section.

A review of the SRS list, as provided by EDR, and dated 03/11/2012 has revealed that there are 6 SRS sites within approximately 0.125 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
NORM MCGREW PLACE	*316 NORM MCGREW PLACE*	*0 - 1/8 (0.000 mi.)*	*B86*	*109*
MINNESOTA BUSINESS & TECH CENT	*511 ELEVENTH AVENUE S.*	*ESE 0 - 1/8 (0.004 mi.)*	*I136*	*269*
NORM MCGREW AND 3RD	*NORM MCGREW AND 3RD*	*NNE 0 - 1/8 (0.005 mi.)*	*B143*	*362*
MINNEAPOLIS ADMINSTRATION SITE	*1101 SOUTH 3RD STREET*	*ENE 0 - 1/8 (0.066 mi.)*	*S191*	*506*
PALMER'S AUTO	*600 5TH STREET NORTH*	*NW 0 - 1/8 (0.078 mi.)*	*X212*	*556*
PARCEL F	*900 WASHINGTON AVENUE S*	*NNE 0 - 1/8 (0.090 mi.)*	*AA247*	*640*

Records of Emergency Release Reports

SPILLS: This is the Minnesota Pollution Coontrol Agency's Spills Log.

A review of the SPILLS list, as provided by EDR, and dated 11/01/2012 has revealed that there are 37 SPILLS sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ECSU-5	*CHICAGO & 5TH*	*0 - 1/8 (0.000 mi.)*	*G87*	*117*
UNKOWN RP	*530 CHICAGO AVENUE*	*0 - 1/8 (0.000 mi.)*	*G94*	*124*
UNKNOWN	*5TH ST AND PARK AVE S*	*NNW 0 - 1/8 (0.001 mi.)*	*F97*	*133*
Spill Closure: Response Completed				
STAR TRIBUNE	*S 5TH ST & PARK AVE S*	*NW 0 - 1/8 (0.002 mi.)*	*F104*	*138*
Spill Closure: Response Completed				
XCEL ENERGY - PAD MOUNT TRANSF	*601 CHICAGO AVENUE*	*WNW 0 - 1/8 (0.005 mi.)*	*J146*	*372*
Spill Closure: Response Completed				
FORSENIC SCIENCE BUILDING	*530 CHICAGO AVE S*	*NW 0 - 1/8 (0.009 mi.)*	*G153*	*383*
HENNEPIN COUNTY PUBLIC WORKS -	*600 PARK AVE, 7TH & PAR*	*WNW 0 - 1/8 (0.035 mi.)*	*P166*	*411*
Spill Closure: Response Completed				
METRODOME SQUARE BUILDING	*1010 S 7TH ST*	*SSE 0 - 1/8 (0.079 mi.)*	*Z219*	*575*
Spill Closure: Response Completed				
UNKNOWN	*7TH & 11TH AVE*	*SSE 0 - 1/8 (0.079 mi.)*	*AC231*	*618*

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CHURCH	***810 S 7TH ST***	***WSW 0 - 1/8 (0.080 mi.)***	***AB237***	***626***
HCMC - EAST BASEMENT	***717 CHICAGO AVENUE***	***WSW 0 - 1/8 (0.095 mi.)***	***AB258***	***677***
Spill Closure: Response Completed				
OT	***PARK & 7TH***	***W 0 - 1/8 (0.110 mi.)***	***AG286***	***740***
Spill Closure: Response Completed				

Lower Elevation	Address	Direction / Distance	Map ID	Page
EAST CENTRAL PARKING RAMP	***425 PARK AVENUE***	***0 - 1/8 (0.000 mi.)***	***C53***	***78***
Spill Closure: Refer To Air Quality				
XCEL ENERGY - TRANSFORMER	***700 SOUTH 4TH STREET***	***0 - 1/8 (0.000 mi.)***	***C57***	***82***
Spill Closure: Response Completed				
Not reported	5TH ST & 11TH AVE-ELLIO	0 - 1/8 (0.000 mi.)	I90	120
NORTHERN STATES POWER COMPANY	***4TH ST & PARK AVE***	***0 - 1/8 (0.001 mi.)***	***C95***	***127***
NORTHERN STATES POWER	***802 3RD ST S***	***NNE 0 - 1/8 (0.002 mi.)***	***L108***	***142***
Not reported	4TH AND PARK	NNW 0 - 1/8 (0.003 mi.)	C116	155
AT&T MINNEAPOLIS MN0305	***511 11TH AVE S***	***ESE 0 - 1/8 (0.004 mi.)***	***I135***	***247***
HENNEPIN COUNTY ENERGY CENTER	***600 10TH AVE SO***	***SE 0 - 1/8 (0.004 mi.)***	***K140***	***303***
Spill Closure: Response Completed				
HENNEPIN COUNTY ENERGY CENTER	***600 10TH AVE S***	***SE 0 - 1/8 (0.004 mi.)***	***K142***	***319***
Spill Closure: Nonsignificant, No Followup				
RITZ HOTEL (FORMER)	***3RD & 4TH ST***	***NNE 0 - 1/8 (0.005 mi.)***	***B144***	***369***
HENNEPIN COUNTY ENERGY CENTER	***ADDRESS UNKNOWN***	***SE 0 - 1/8 (0.006 mi.)***	***K149***	***378***
NORTHERN STATES POWER	***640 11TH AVE S***	***SE 0 - 1/8 (0.034 mi.)***	***M160***	***397***
Spill Closure: Response Completed				
XCEL ENERGY - TRANSFORMER	***1100 5TH STREET SOUTH***	***E 0 - 1/8 (0.055 mi.)***	***R171***	***430***
Spill Closure: Response Completed				
ELLIOT PARK SUBSTATION - NSP	***1100 5TH ST S***	***ESE 0 - 1/8 (0.056 mi.)***	***R174***	***441***
VALSPAR CORPORATION (THE)	***312 SOUTH 11TH STREET***	***ENE 0 - 1/8 (0.059 mi.)***	***S180***	***481***
Spill Closure: Refer To Local/County Gov.				
Spill Closure: Response Completed				
CARGILL	***616 S 3RD ST***	***NNW 0 - 1/8 (0.065 mi.)***	***T183***	***490***
Spill Closure: Response Completed				
AUGSBURG FORTNESS PRESS	***616 W 3RD ST***	***NNW 0 - 1/8 (0.065 mi.)***	***T186***	***498***
HIGHWAY	***3RD ST S AND 11ST AVE S***	***ENE 0 - 1/8 (0.065 mi.)***	***S187***	***500***
Spill Closure: Response Completed				
RIVERSIDE PLAZA	***615 S 4TH ST***	***NNW 0 - 1/8 (0.067 mi.)***	***U197***	***531***
Spill Closure: Refer To Local/County Gov.				
TWIN CITIES STEEL TREATING PLA	***1112 S 3RD ST***	***ENE 0 - 1/8 (0.072 mi.)***	***S203***	***548***
TWIN CITY STEEL TREATING CO IN	***1114 S 3RD ST***	***ENE 0 - 1/8 (0.073 mi.)***	***S205***	***551***
Spill Closure: Closed, Other (See Remarks)				
STAR TRIBUNE	***425 PORTLAND AVE S***	***NNW 0 - 1/8 (0.079 mi.)***	***U225***	***584***
ZIEGLER BOR-SON JOB SITE (BY T	***S 9TH AVE & WASHINGTON***	***NNE 0 - 1/8 (0.090 mi.)***	***AA248***	***655***
THE STATION	***1010 WASHINGTON AVE S***	***NE 0 - 1/8 (0.109 mi.)***	***W279***	***723***
TNT HOLLAND??	***WASHINGTON & PORTLAND***	***N 0 - 1/8 (0.110 mi.)***	***AF284***	***735***

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 02/12/2013 has revealed that there are 21 RCRA NonGen / NLR sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GOPHER STATE LITHO	***501 PARK AVE***	***0 - 1/8 (0.000 mi.)***	***F83***	***102***
U OF M PARK AVE	***501 PARK AVE***	***0 - 1/8 (0.000 mi.)***	***F84***	***104***
HENNEPIN COUNTY SHERIFF'S OFFI	***626 S 6TH ST***	***WNW 0 - 1/8 (0.067 mi.)***	***V198***	***534***
MINNEAPOLIS MEDICAL RESEARCH -	***519 PORTLAND AVE***	***NW 0 - 1/8 (0.079 mi.)***	***X215***	***570***
FIRST COVENANT CHURCH	810 7TH ST S	WSW 0 - 1/8 (0.080 mi.)	AB235	624

Lower Elevation	Address	Direction / Distance	Map ID	Page
EAGLE STANDARD	***728 S 4TH ST***	***0 - 1/8 (0.000 mi.)***	***C45***	***59***
BRW INC	***700 3RD ST S***	***N 0 - 1/8 (0.002 mi.)***	***D112***	***147***
BISHOP BUILDING CO	***1015 S 6TH ST***	***SE 0 - 1/8 (0.003 mi.)***	***K114***	***153***
CONTROL DATA BUSINESS AND TECH	***511 11TH AVE S***	***ESE 0 - 1/8 (0.003 mi.)***	***I121***	***175***
APPLIED ENVIRONMENTAL SCIENCES	***511 11TH AVE S STE 251***	***ESE 0 - 1/8 (0.004 mi.)***	***I129***	***213***
EXPRESS IMAGE INC	***617 11TH AVE S***	***SE 0 - 1/8 (0.017 mi.)***	***M156***	***392***
TOLOMATIC INC	***1028 S 3RD ST***	***NE 0 - 1/8 (0.034 mi.)***	***O161***	***400***
AMERICAN TRIO LOFTS	***250 PARK AVE***	***N 0 - 1/8 (0.055 mi.)***	***Q170***	***429***
CARGILL INC - 3RD ST	***616 S 3RD ST***	***NNW 0 - 1/8 (0.065 mi.)***	***T185***	***496***
TWIN CITY STEEL TREATING INC	***1114 S 3RD ST***	***ENE 0 - 1/8 (0.073 mi.)***	***S206***	***554***
DPD PRINT MANAGEMENT	***903 WASHINGTON AVE S***	***NNE 0 - 1/8 (0.079 mi.)***	***AA228***	***615***
DUPLICATE PERISCOPE INC	***921 WASHINGTON AVE S***	***NE 0 - 1/8 (0.080 mi.)***	***AA233***	***623***
LEMAR COLOR LAB	***241 PORTLAND AVE S***	***N 0 - 1/8 (0.090 mi.)***	***T251***	***658***
BRUCE PRINTING INC	***1001 WASHINGTON AVE S***	***NE 0 - 1/8 (0.094 mi.)***	***W256***	***667***
NATIONAL GUARDIAN	***1229 S 6TH ST***	***ESE 0 - 1/8 (0.104 mi.)***	***AD273***	***706***
LIQUOR DEPOT	1010 WASHINGTON AVE S	NE 0 - 1/8 (0.109 mi.)	W280	726

TSCA: The Toxic Substances Control Act identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site. The United States Environmental Protection Agency has no current plan to update and/or re-issue this database.

A review of the TSCA list, as provided by EDR, and dated 12/31/2006 has revealed that there is 1 TSCA site within approximately 0.125 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
THE VALSPAR CORPORATION	1101 SOUTH THIRD STREET	ENE 0 - 1/8 (0.066 mi.)	S193	516

FTTS: FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act) over the previous five years. To maintain currency, EDR contacts the Agency on a quarterly basis.

A review of the FTTS list, as provided by EDR, and dated 04/09/2009 has revealed that there are 3 FTTS sites within approximately 0.125 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
VALSPAR CORP	1101 S THIRD ST	ENE 0 - 1/8 (0.066 mi.)	S188	503
THE VALSPAR CORP	***1101 SO THIRD ST***	***ENE 0 - 1/8 (0.066 mi.)***	***S190***	***505***
VALSPAR CO	***1101 SO THIRD ST***	***ENE 0 - 1/8 (0.066 mi.)***	***S192***	***516***

HIST FTTS: A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

A review of the HIST FTTS list, as provided by EDR, and dated 10/19/2006 has revealed that there are 3 HIST FTTS sites within approximately 0.125 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
VALSPAR CORP	1101 S THIRD ST	ENE 0 - 1/8 (0.066 mi.)	S189	504
THE VALSPAR CORP	***1101 SO THIRD ST***	***ENE 0 - 1/8 (0.066 mi.)***	***S190***	***505***
VALSPAR CO	***1101 SO THIRD ST***	***ENE 0 - 1/8 (0.066 mi.)***	***S192***	***516***

ICIS: The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

A review of the ICIS list, as provided by EDR, and dated 07/20/2011 has revealed that there are 2 ICIS sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
DOUGLAS CORP	620 12TH AVENUE SOUTH	SE 0 - 1/8 (0.098 mi.)	AE270	700

Lower Elevation	Address	Direction / Distance	Map ID	Page
VALSPAR CO	1101 S 3RD ST MINNEA	ENE 0 - 1/8 (0.057 mi.)	S177	451

PADS: The PCB Activity Database identifies generators, transporters, commercial storers and/or brokers and disposers of PCBs who are required to notify the United States Environmental Protection Agency of such activities. The source of this database is the U.S. EPA.

A review of the PADS list, as provided by EDR, and dated 11/01/2010 has revealed that there are 2 PADS sites within approximately 0.125 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
BALDWIN SUPPLY CO INC	***601 11TH AVE S***	***SE 0 - 1/8 (0.006 mi.)***	***M148***	***377***
DPD PRINT MANAGEMENT	***903 WASHINGTON AVE S***	***NNE 0 - 1/8 (0.079 mi.)***	***AA228***	***615***

EXECUTIVE SUMMARY

MLTS: The Material Licensing Tracking System is maintained by the Nuclear Regulatory Commission and contains a list fo approximately 8,100 sites which possess or use radioactive materials and are subject to NRC licensing requirements.

A review of the MLTS list, as provided by EDR, and dated 06/21/2011 has revealed that there are 3 MLTS sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
HENNEPIN COUNTY MEDICAL CENTER	701 PARK AVENUE SOUTH	W 0 - 1/8 (0.113 mi.)	AG290	743
HENNEPIN COUNTY MEDICAL CENTER	***701 PARK AVENUE***	***W 0 - 1/8 (0.113 mi.)***	***AG293***	***767***

Lower Elevation	Address	Direction / Distance	Map ID	Page
LIQUOR DEPOT	***1010 WASHINGTON AVE S***	***NE 0 - 1/8 (0.109 mi.)***	***W281***	***727***

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 10/23/2011 has revealed that there are 50 FINDS sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GOPHER STATE LITHO	***501 PARK AVE***	***0 - 1/8 (0.000 mi.)***	***F83***	***102***
U OF M PARK AVE	***501 PARK AVE***	***0 - 1/8 (0.000 mi.)***	***F84***	***104***
HENNEPIN COUNTY CRIME LAB UNIT	531 PARK AVE S	0 - 1/8 (0.000 mi.)	F92	122
HENNEPIN COUNTY JUVENILE DETEN	510 PARK AVE S	NW 0 - 1/8 (0.001 mi.)	F98	135
HENNEPIN COUNTY SHERIFF'S OFFI	***626 S 6TH ST***	***WNW 0 - 1/8 (0.067 mi.)***	***V198***	***534***
HENNEPIN COUNTY JUVENILE DETEN	***626 S 6TH ST RM C20***	***WNW 0 - 1/8 (0.067 mi.)***	***V200***	***545***
RED DOOR CLINIC HENNEPIN CO CO	***525 PORTLAND AVE STE LL***	***NW 0 - 1/8 (0.078 mi.)***	***X213***	***566***
HENNEPIN COUNTY HEALTH SERVICE	***525 PORTLAND AVE STE MC***	***NW 0 - 1/8 (0.078 mi.)***	***X214***	***568***
MINNEAPOLIS MEDICAL RESEARCH -	***519 PORTLAND AVE***	***NW 0 - 1/8 (0.079 mi.)***	***X215***	***570***
FIRST COVENANT CHURCH	810 7TH ST S	WSW 0 - 1/8 (0.080 mi.)	AB234	624
MASTERWORKS OF MINNEAPOLIS INC	***1121 7TH ST S***	***SE 0 - 1/8 (0.094 mi.)***	***AE254***	***665***
DOUGLAS CORP - MPLS	***620 12TH AVE S***	***SE 0 - 1/8 (0.098 mi.)***	***AE269***	***688***
HENNEPIN COUNTY PUB SERV MINNE	***7TH AND PARK AVE S***	***W 0 - 1/8 (0.110 mi.)***	***AG285***	***737***
HENNEPIN COUNTY MEDICAL CENTER	***701 PARK AVENUE***	***W 0 - 1/8 (0.113 mi.)***	***AG293***	***767***

Lower Elevation	Address	Direction / Distance	Map ID	Page
LAKE OF THE ISLES PARK IMP PHA	***SEE LOCATION DESCRIPTIO***	***0 - 1/8 (0.000 mi.)***	***B24***	***29***
HUMBOLDT AVENUE GREENWAY, PHAS	***ALONG HUMBOLDT AVE N BE***	***0 - 1/8 (0.000 mi.)***	***B29***	***31***
CHICAGO AVE BRIDGE AND PAVING	***SEE LOCATION DESCRIPTIO***	***0 - 1/8 (0.000 mi.)***	***B32***	***32***
MINNEHAHA CREEK TRAIL -CSW	200 GRAIN EXCHANGE	0 - 1/8 (0.000 mi.)	B35	44
SP 27-752-09; CP 9518 & 9621	***WASHINGTON AVE FROM PLY***	***0 - 1/8 (0.000 mi.)***	***B36***	***44***
COUNTY PROJECT 9018; SAP 27-63	***CSAH 36 (UNIVERSITY AVE***	***0 - 1/8 (0.000 mi.)***	***B40***	***47***
STAR TRIBUNE	***716 S 4TH ST***	***0 - 1/8 (0.000 mi.)***	***C41***	***48***
EAGLE STANDARD	***728 S 4TH ST***	***0 - 1/8 (0.000 mi.)***	***C45***	***59***
RUNWAY 17-35 WEST CARGO APRON	***MINNEAPOLIS - ST PAUL A***	***0 - 1/8 (0.000 mi.)***	***B47***	***72***
GRAINGER INDUSTRIAL SUPPLY - M	724 3RD ST S	N 0 - 1/8 (0.002 mi.)	D109	144
BRW INC	***700 3RD ST S***	***N 0 - 1/8 (0.002 mi.)***	***D112***	***147***

EXECUTIVE SUMMARY

Lower Elevation	Address	Direction / Distance	Map ID	Page
BISHOP BUILDING CO	***1015 S 6TH ST***	***SE 0 - 1/8 (0.003 mi.)***	***K114***	***153***
NEXTEL 40	511 11TH AVENUE SOUTH,	ESE 0 - 1/8 (0.003 mi.)	I118	157
CONTROL DATA BUSINESS AND TECH	***511 11TH AVE S***	***ESE 0 - 1/8 (0.003 mi.)***	***I121***	***175***
JOHNSTECH INTERNATIONAL - MPLS	***511 11TH AVE S***	***ESE 0 - 1/8 (0.004 mi.)***	***I127***	***205***
APPLIED ENVIRONMENTAL SCIENCES	***511 11TH AVE S STE 251***	***ESE 0 - 1/8 (0.004 mi.)***	***I129***	***213***
HENNEPIN COUNTY ENERGY CENTER	***600 10TH AVE S***	***SE 0 - 1/8 (0.004 mi.)***	***K141***	***309***
SAMUEL BINGHAM CO	***900 S. 3RD ST.***	***NNE 0 - 1/8 (0.005 mi.)***	***B147***	***375***
BALDWIN SUPPLY CO INC	***601 11TH AVE S***	***SE 0 - 1/8 (0.006 mi.)***	***M148***	***377***
EXPRESS IMAGE INC	***617 11TH AVE S***	***SE 0 - 1/8 (0.017 mi.)***	***M156***	***392***
TOLOMATIC INC	***1028 S 3RD ST***	***NE 0 - 1/8 (0.034 mi.)***	***O161***	***400***
MCWHORTER TECHNOLOGIES	1028 S 3RD ST	NE 0 - 1/8 (0.034 mi.)	O165	411
AMERICAN TRIO LOFTS	250 PARK AVE	N 0 - 1/8 (0.056 mi.)	Q175	450
VALSPAR CORPORATION (THE)	312 11TH AVENUE SOUTH	ENE 0 - 1/8 (0.059 mi.)	S181	489
CARGILL INC - 3RD ST	***616 S 3RD ST***	***NNW 0 - 1/8 (0.065 mi.)***	***T185***	***496***
VALSPAR CORPORATION (THE)	***312 S 11TH AVE***	***ENE 0 - 1/8 (0.066 mi.)***	***S196***	***518***
TWIN CITY STEEL TREATING INC	***1114 S 3RD ST***	***ENE 0 - 1/8 (0.073 mi.)***	***S206***	***554***
AMERICAN ACADEMY OF NEUROLOGY	201 CHICAGO AVENUE SOUT	NNE 0 - 1/8 (0.076 mi.)	Y208	555
DPD PRINT MANAGEMENT	***903 WASHINGTON AVE S***	***NNE 0 - 1/8 (0.079 mi.)***	***AA228***	***615***
PERISCOPE INC	***921 WASHINGTON AVE S***	***NE 0 - 1/8 (0.080 mi.)***	***AA232***	***621***
DUPLICATE PERISCOPE INC	***921 WASHINGTON AVE S***	***NE 0 - 1/8 (0.080 mi.)***	***AA233***	***623***
LEMAR COLOR LAB	***241 PORTLAND AVE S***	***N 0 - 1/8 (0.090 mi.)***	***T251***	***658***
BRUCE PRINTING INC	***1001 WASHINGTON AVE S***	***NE 0 - 1/8 (0.094 mi.)***	***W256***	***667***
GUTHRIE SCENE SHOP	212 9TH AVE S	NNE 0 - 1/8 (0.098 mi.)	AA265	684
NATIONAL GUARDIAN	***1229 S 6TH ST***	***ESE 0 - 1/8 (0.104 mi.)***	***AD273***	***706***
LIQUOR DEPOT	***1010 WASHINGTON AVE S***	***NE 0 - 1/8 (0.109 mi.)***	***W281***	***727***

MN LS: The List of Sites includes: Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), No Further Remedial Action Planned (NFRAP), National Priorities List (NPL), Permanent List of Priorities (PLP), Sites delisted from the Permanent List of Priorities (DPLP), Hazardous Waste Permit Unit Project Facilities (HW PERM), List of Permitted Solid Waste Facilities (SW PERM), 1980 Metropolitan Area Waste Disposal Site Inventory,1980 Statewide Outstate Dump Inventory (ODI), Voluntary and Investigation Program (VIC), and Closed Landfill Sites Undergoing Cleanup (LCP). The List of Sites comes from Minnesota Pollution Control

A review of the MN LS list, as provided by EDR, and dated 04/22/2009 has revealed that there are 9 MN LS sites within approximately 0.125 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
NORTH THIRD STREET PROPERTY	***735 763 & 805 N 3RD ST***	***0 - 1/8 (0.000 mi.)***	***D37***	***44***
NORM MCGREW PLACE	***316 NORM MCGREW PLACE***	***0 - 1/8 (0.000 mi.)***	***B86***	***109***
MINNESOTA BUSINESS AND TECHNOL	***511 11TH AVE S***	***ESE 0 - 1/8 (0.004 mi.)***	***I124***	***190***
NORM MCGREW AND 3RD	***NORM MCGREW AND 3RD***	***NNE 0 - 1/8 (0.005 mi.)***	***B143***	***362***
ROCK ISLAND YARD FUEL OIL	***SEE LOCATION DESCRIPTIO***	***N 0 - 1/8 (0.011 mi.)***	***D155***	***392***
OLD LOCATION OF UNION SCRAP	***SEE LOCATION DESCRIPTIO***	***NE 0 - 1/8 (0.072 mi.)***	***W201***	***547***
GUTHRIE THEATER AUXILIARY	***WASHINGTON AVE S & CHIC***	***NNE 0 - 1/8 (0.089 mi.)***	***Y246***	***639***
WASHINGTON AVENUE RAILROAD PRO	***SEE LOCATION DESCRIPTIO***	***NNE 0 - 1/8 (0.105 mi.)***	***Y274***	***708***
PARCEL F	***SEE LOCATION DESCRIPTIO***	***NNE 0 - 1/8 (0.117 mi.)***	***Y298***	***785***

MANIFEST: Hazardous waste manifest data.

A review of the MANIFEST list, as provided by EDR, and dated 12/31/2011 has revealed that there are 5 MANIFEST sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
HENNEPIN COUNTY MEDICAL CENTER	***PARK AVE & 6TH ST***	***W 0 - 1/8 (0.113 mi.)***	***AG291***	***744***

Lower Elevation	Address	Direction / Distance	Map ID	Page
HENNEPIN COUNTY ENERGY CENTER	***600 10TH AVE S***	***SE 0 - 1/8 (0.004 mi.)***	***K142***	***319***
VALSPAR E-COAT LAB	1028 3RD ST S	NE 0 - 1/8 (0.007 mi.)	N150	381
VALSPAR CORPORATION INDUSTRIAL	1014 3RD ST S	NE 0 - 1/8 (0.007 mi.)	N151	382
VALSPAR RESEARCH LAB	***312 11TH AVE S***	***ENE 0 - 1/8 (0.059 mi.)***	***S179***	***476***

ENF: This Regulatory Compliance, Hazardous Waste Enforcement Log and Hazardous Waste Permit Unit Project Identification List comes from the Minnesota Pollution Control Agency's Generators Associated with Enforcement Logs.

A review of the ENF list, as provided by EDR, and dated 09/18/2012 has revealed that there are 3 ENF sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
DOUGLAS CORPORATION	620 12TH AVENUE SOUTH	SE 0 - 1/8 (0.098 mi.)	AE272	706
HENNEPIN COUNTY MEDICAL CENTER	701 PARK AVENUE	W 0 - 1/8 (0.113 mi.)	AG294	783

Lower Elevation	Address	Direction / Distance	Map ID	Page
VALSPAR CORPORATION (THE)	***312 SOUTH 11TH STREET***	***ENE 0 - 1/8 (0.059 mi.)***	***S180***	***481***

AIRS: A listing of permitted AIRS facilities.

A review of the AIRS list, as provided by EDR, and dated 12/11/2012 has revealed that there are 3 AIRS sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
DOUGLAS CORP - MPLS	***620 12TH AVE S***	***SE 0 - 1/8 (0.098 mi.)***	***AE271***	***704***

Lower Elevation	Address	Direction / Distance	Map ID	Page
HENNEPIN COUNTY ENERGY CENTER	***600 10TH AVE S***	***SE 0 - 1/8 (0.004 mi.)***	***K142***	***319***
VALSPAR CORPORATION (THE)	***312 S 11TH AVE***	***ENE 0 - 1/8 (0.066 mi.)***	***S196***	***518***

TIER 2: A listing of facilities which store or manufacture hazardous materials that submit a chemical inventory report.

A review of the TIER 2 list, as provided by EDR, and dated 12/31/2011 has revealed that there are 20 TIER 2 sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
HENNEPIN COUNTY PUBLIC WORKS -	***600 PARK AVE, 7TH & PAR***	***WNW 0 - 1/8 (0.035 mi.)***	***P166***	***411***
HENNEPIN COUNTY PUBLIC WORKS -	600 PARK AVE, 7TH & PAR	WNW 0 - 1/8 (0.035 mi.)	P167	416
HENNEPIN COUNTY MEDICAL CENTER	***PARK AVE & 6TH ST***	***W 0 - 1/8 (0.113 mi.)***	***AG291***	***744***

Lower Elevation	Address	Direction / Distance	Map ID	Page
MCI	511 11TH AVE S SUITE 30	ESE 0 - 1/8 (0.003 mi.)	I119	157
WORLDCOM	511 11TH AVE S SUITE 30	ESE 0 - 1/8 (0.003 mi.)	I120	169
SPRINT - MINNEAPOLIS SWITCH	511 - 11TH AVENUE S, SU	ESE 0 - 1/8 (0.004 mi.)	I122	176
SUNGARD AVAILABILITY SERVICES,	511 11TH AVENUE S #211	ESE 0 - 1/8 (0.004 mi.)	I123	186
SUNGARD AVAILABILITY SERVICES,	511 11TH AVENUE S	ESE 0 - 1/8 (0.004 mi.)	I125	191
SPRINT MINNEAPOLIS MN PCS SWIT	511 - 11TH AVENUE S, SU	ESE 0 - 1/8 (0.004 mi.)	I126	194
LEVEL 3 - MINNEAPOLIS - MPLSMN	511 11TH AVE S, SUITE 2	ESE 0 - 1/8 (0.004 mi.)	I128	208
LEVEL 3 - MINNEAPOLIS - MPLSMN	511 11TH AVE S, SUITE 2	ESE 0 - 1/8 (0.004 mi.)	I131	215
AT & T	511 11TH AVE S	ESE 0 - 1/8 (0.004 mi.)	I132	231
NEXTEL-MSO-MINNO1	511 - 11TH AVE, SUITE 2	ESE 0 - 1/8 (0.004 mi.)	I133	240
AT&T MINNEAPOLIS MN0305	***511 11TH AVE S***	***ESE 0 - 1/8 (0.004 mi.)***	***I135***	***247***
NEUTRAL TANDEM INC.	511 11TH AVE S. STE 409	ESE 0 - 1/8 (0.004 mi.)	I137	276
MINNEAPOLIS, MN MSO	511 - 11TH AVENUE SOUTH	ESE 0 - 1/8 (0.004 mi.)	I138	283
HENNEPIN COUNTY ENERGY CENTER	***600 10TH AVE S***	***SE 0 - 1/8 (0.004 mi.)***	***K142***	***319***
XCEL ENERGY - ELLIOT PARK SUBS	1100 5TH ST S	ESE 0 - 1/8 (0.056 mi.)	R172	433
XCEL ENERGY - ELLIOT PARK SUBS	1100 5TH ST S	ESE 0 - 1/8 (0.056 mi.)	R173	434
ELLIOT PARK SUBSTATION - NSP	***1100 5TH ST S***	***ESE 0 - 1/8 (0.056 mi.)***	***R174***	***441***

US AIRS: The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

A review of the US AIRS list, as provided by EDR, and dated 11/15/2012 has revealed that there are 2 US AIRS sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
DOUGLAS CORP - MPLS	***620 12TH AVE S***	***SE 0 - 1/8 (0.098 mi.)***	***AE269***	***688***

Lower Elevation	Address	Direction / Distance	Map ID	Page
HENNEPIN COUNTY ENERGY CENTER	***600 10TH AVE S***	***SE 0 - 1/8 (0.004 mi.)***	***K141***	***309***

WIMN: Since 2003, the PCAa??s "Whata??s in My Neighborhood?" database provides information about air quality, hazardous waste, remediation, solid waste, tanks and leaks, and water quality around Minnesota.

A review of the WIMN list, as provided by EDR, and dated 01/13/2013 has revealed that there are 130 WIMN sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
FORMER WAREHOUSE	***406 CHICAGO***	***0 - 1/8 (0.000 mi.)***	***E69***	***92***
MCDA SITE	***4TH ST & KIRBY PUCKETT***	***0 - 1/8 (0.000 mi.)***	***C80***	***97***
MCGILL BUILDING	***501 PARK AVE***	***0 - 1/8 (0.000 mi.)***	***F85***	***105***
1999 STREET IMPROVEMENT PROJEC	ADDRESS UNKNOWN	0 - 1/8 (0.000 mi.)	H88	119
MINNEAPOLIS STREET IMPROV	ADDRESS UNKNOWN	0 - 1/8 (0.000 mi.)	H91	122
HENNEPIN COUNTY CRIME LAB UNIT	***531 PARK AVE S***	***0 - 1/8 (0.000 mi.)***	***F93***	***122***
HENNEPIN COUNTY JUVENILE DETEN	510 PARK AVE S	NW 0 - 1/8 (0.001 mi.)	F99	136
FORMERLY CENTRAL FOOD FACILITY	530 CHICAGO AVE S	NW 0 - 1/8 (0.009 mi.)	G154	391
HENNEPIN COUNTY MEDICAL CENTER	***626 PARK AVE***	***WNW 0 - 1/8 (0.058 mi.)***	***P178***	***467***
JUVENILE JUSTICE CENTER	***626 S 6TH ST***	***WNW 0 - 1/8 (0.067 mi.)***	***V199***	***535***

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
HENNEPIN COUNTY JUVENILE DETEN	***626 S 6TH ST RM C20***	***WNW 0 - 1/8 (0.067 mi.)***	***V200***	***545***
RED DOOR CLINIC HENNEPIN CO CO	***525 PORTLAND AVE STE LL***	***NW 0 - 1/8 (0.078 mi.)***	***X213***	***566***
HENNEPIN COUNTY HEALTH SERVICE	***525 PORTLAND AVE STE MC***	***NW 0 - 1/8 (0.078 mi.)***	***X214***	***568***
MINNEAPOLIS MEDICAL RESEARCH -	519 PORTLAND AVE	NW 0 - 1/8 (0.079 mi.)	X216	572
METRODOME SQUARE BUILDING	1010 S 7TH ST	SSE 0 - 1/8 (0.079 mi.)	Z218	574
FIRST COVENANT CHURCH	810 S 7TH ST	WSW 0 - 1/8 (0.080 mi.)	AB236	625
HOPE COMMUNITY CHURCH	704 11TH AVE S	SSE 0 - 1/8 (0.085 mi.)	AC242	630
DEPENDABLE GARAGE	***619 PORTLAND***	***WNW 0 - 1/8 (0.094 mi.)***	***V253***	***661***
MASTERWORKS OF MINNEAPOLIS INC	***1121 7TH ST S***	***SE 0 - 1/8 (0.094 mi.)***	***AE254***	***665***
DOUGLAS CORP - MPLS	***620 12TH AVE S***	***SE 0 - 1/8 (0.098 mi.)***	***AE271***	***704***
HENNEPIN COUNTY PUBLIC WORKS M	7TH & PARK AVE S	W 0 - 1/8 (0.112 mi.)	AG289	743
HENNEPIN COUNTY MEDICAL CENTER	***701 PARK AVE S***	***W 0 - 1/8 (0.113 mi.)***	***AG292***	***752***

Lower Elevation	Address	Direction / Distance	Map ID	Page
SP 027-603-031 - CP 9758 (CSAH	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B5	22
SP 2725-52 (TH 55) RECONSTRUC	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B6	22
NEAR NORTH DEVELOPMENT	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B7	23
SHINGLE CREEK EAST PAVING PROJ	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B8	23
GOLD MEDAL PARK	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B9	23
S FAIRVIEW/ N LYYNDALE AVE	LYNDALE AVE	0 - 1/8 (0.000 mi.)	B10	24
K AND K METAL RECYCLING SITE I	ADDRESS UNKNOWN	0 - 1/8 (0.000 mi.)	B11	24
EAST RIVER PKWY BRIDGE/BRIDAL	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B12	24
HIAWATHA AVE PROJ 3 (TH 55)	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B13	25
SP 2725-57, TH 55/62	HIGHWAY 55 & HIGHWAY 62	0 - 1/8 (0.000 mi.)	B14	25
SP 2726-61 (TH 47)	TH 47 FROM 27TH AVE NE	0 - 1/8 (0.000 mi.)	B15	25
DOUGLAS AVE N PAVING	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B16	26
SP 2781-289 (TH 94-392)	I-94 FROM RIVERSIDE AVE	0 - 1/8 (0.000 mi.)	B17	26
FORT SNELLING ATHLETIC COMPLEX	BTWN. HWY 55, TAYLOR AV	0 - 1/8 (0.000 mi.)	B18	26
STEVENS SQUARE PAVING PROJECT	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B19	27
ZENITH AND ALOFT	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B20	27
MET COUNCIL - MINNEAPOLIS SEWE	ADDRESS UNKNOWN	0 - 1/8 (0.000 mi.)	B21	27
CP 9754-SP 027-603-035	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B22	28
MILL RUINS PARK PHASE 4, PED C	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B23	28
LAKE OF THE ISLES PARK IMP PHA	***SEE LOCATION DESCRIPTIO***	***0 - 1/8 (0.000 mi.)***	***B24***	***29***
2000 STREET IMPROVEMENT PROJEC	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B25	29
LONGFELLOW GARDENS SITE DEVELO	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B26	30
TH 55 (HIAWATHA) HIGHWAY CONST	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B27	30
2ND AVE S & MARQUETTE AVE - MP	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B28	30
HUMBOLDT AVENUE GREENWAY, PHAS	***ALONG HUMBOLDT AVE N BE***	***0 - 1/8 (0.000 mi.)***	***B29***	***31***
TOUCH AMERICA FIBER OPTIC PROJ	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B30	31
PERKINS HILL	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B31	31
CHICAGO AVE BRIDGE AND PAVING	***SEE LOCATION DESCRIPTIO***	***0 - 1/8 (0.000 mi.)***	***B32***	***32***
FLEET SERVICE GARAGE - BLOCK 7	***716 S 4TH ST***	***0 - 1/8 (0.000 mi.)***	***C34***	***33***
SP 27-752-09; CP 9518 & 9621	***WASHINGTON AVE FROM PLY***	***0 - 1/8 (0.000 mi.)***	***B36***	***44***
NORTH THIRD STREET PROPERTY	***735 763 & 805 N 3RD ST***	***0 - 1/8 (0.000 mi.)***	***D37***	***44***
EXECUTIVE PARKING LOT - BLOCK	NW CORNER OF 5TH ST & P	0 - 1/8 (0.000 mi.)	B38	45
COUNTY PROJECT 9018; SAP 27-63	***CSAH 36 (UNIVERSITY AVE***	***0 - 1/8 (0.000 mi.)***	***B40***	***47***
CO PROJECT 9020, SAP 27-637-03	CSAH 37 (4TH ST SE) BET	0 - 1/8 (0.000 mi.)	B42	58
TWIN LAKES SUBWATERSHED IMPROV	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B43	58
PEARL PARK	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B44	59
EAGLE STANDARD	***728 S 4TH ST***	***0 - 1/8 (0.000 mi.)***	***C45***	***59***
SKYSCAPE - CSW	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B46	72
RUNWAY 17-35 WEST CARGO APRON	***MINNEAPOLIS - ST PAUL A***	***0 - 1/8 (0.000 mi.)***	***B47***	***72***
FOLWELL PAVING PROJECT	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B48	73
FLOOD AREA 1 - 42ND & RUSSELL	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B49	73

EXECUTIVE SUMMARY

Lower Elevation	Address	Direction / Distance	Map ID	Page
TWIN CITY GEAR	***823 25 17TH AVE S***	***0 - 1/8 (0.000 mi.)***	***B51***	***74***
MINNEAPOLIS - PORTAL, MN #5421	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B54	81
LAKE HIAWATHA FLOOD AREA 27	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B55	81
THEODORE WIRTH/EAST RIVER PKWY	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B56	81
CEDAR LAKE PARK TRL	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B58	84
WEST RIVER PKWY IMPROV	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B59	85
U OF M-HANSON HALL	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B60	85
SOUTHWEST MITIGATION	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B62	86
PEDESTRIAN & BICYCLE TRAILS	ALONG W RIVER PKWY BETW	0 - 1/8 (0.000 mi.)	B63	86
THE BRIDGEWATER - CSW	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B64	86
MILL RUINS PARK IMPROV - PHASE	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B65	87
STAR TRIBUNE PARKING LOT	***701 S 4TH ST***	***0 - 1/8 (0.000 mi.)***	***C66***	***87***
MINNEHAHA AVE STREET IMPROVEME	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B67	91
2001 ST. IMPROVMENT PROJECT	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B68	91
LAKE NOKOMIS WQ IMPROVEMENT PR	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B70	94
GLENWOOD RESIDENTIAL PAVING PR	ADDRESS UNKNOWN	0 - 1/8 (0.000 mi.)	B71	94
1998 STREET IMPROVEMENT PROJEC	ADDRESS UNKNOWN	0 - 1/8 (0.000 mi.)	B72	94
RENAISSANCE ON THE RIVER	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B73	95
CENTRAL AVE NE - TH 65 PAVING	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B74	95
STAR & TRIBUNE PARKING LOT - B	SE CORNER OF 5TH AVE &	0 - 1/8 (0.000 mi.)	B75	95
LORING PARK SITE IMPROV	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B76	96
FRANKLIN AVENUE STREETSCAPE PR	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B77	96
LAKE HARRIET & LAKE CALHOUN PA	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B78	96
MNDOT I35W BRIDGE	INTERSTATE 35W	0 - 1/8 (0.000 mi.)	B79	97
N DOUGLAS (E) & GROVELAND AVE	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B81	101
EWING AVE RECONSTRUCTION - CSW	SEE LOCATION DESCRIPTIO	0 - 1/8 (0.000 mi.)	B82	101
NORM MCGREW PLACE	***316 NORM MCGREW PLACE***	***0 - 1/8 (0.000 mi.)***	***B86***	***109***
GRAINGER INDUSTRIAL SUPPLY - M	***724 3RD ST S***	***N 0 - 1/8 (0.002 mi.)***	***D110***	***145***
BRW INC	700 S 3RD ST STE 600	N 0 - 1/8 (0.002 mi.)	D111	146
THRESHER SQUARE	***708 S 3RD ST***	***N 0 - 1/8 (0.002 mi.)***	***D113***	***148***
BISHOP BUILDING CO	***1015 S 6TH ST***	***SE 0 - 1/8 (0.003 mi.)***	***K114***	***153***
MINNESOTA BUSINESS AND TECHNOL	***511 11TH AVE S***	***ESE 0 - 1/8 (0.004 mi.)***	***I124***	***190***
APPLIED ENVIRONMENTAL SCIENCES	***511 11TH AVE S STE 251***	***ESE 0 - 1/8 (0.004 mi.)***	***I129***	***213***
LEVEL 3 MINNEAPOLIS	511 11TH AVE S STE 210	ESE 0 - 1/8 (0.004 mi.)	I130	214
NRG/HENNEPIN COUNTY ENERGY CEN	***600 10TH AVE S***	***SE 0 - 1/8 (0.004 mi.)***	***K139***	***286***
HENNEPIN COUNTY ENERGY CENTER	***600 10TH AVE S***	***SE 0 - 1/8 (0.004 mi.)***	***K142***	***319***
NORM MCGREW AND 3RD	***NORM MCGREW AND 3RD***	***NNE 0 - 1/8 (0.005 mi.)***	***B143***	***362***
BALDWIN SUPPLY CO INC	***601 11TH AVE S***	***SE 0 - 1/8 (0.006 mi.)***	***M148***	***377***
SAMUEL BINGHAM CO	900 S 3RD ST	NNE 0 - 1/8 (0.007 mi.)	B152	383
ROCK ISLAND YARD FUEL OIL	***SEE LOCATION DESCRIPTIO***	***N 0 - 1/8 (0.011 mi.)***	***D155***	***392***
EXPRESS IMAGE INC	***617 11TH AVE S***	***SE 0 - 1/8 (0.017 mi.)***	***M156***	***392***
VALSPAR CORP INDUSTRIAL LAB	1014 S 3RD ST	NE 0 - 1/8 (0.029 mi.)	N159	397
VALSPAR	***1028 S 3RD ST***	***NE 0 - 1/8 (0.034 mi.)***	***O163***	***403***
AMERICAN TRIO LOFTS	***250 PARK AVE***	***N 0 - 1/8 (0.055 mi.)***	***Q170***	***429***
VALSPAR RESEARCH LAB	***312 11TH AVE S***	***ENE 0 - 1/8 (0.059 mi.)***	***S179***	***476***
CARGILL	***616 S 3RD ST***	***NNW 0 - 1/8 (0.065 mi.)***	***T183***	***490***
VALSPAR APPLIED SCIENCE & TECH	1101 S 3RD ST	ENE 0 - 1/8 (0.066 mi.)	S194	517
OLD LOCATION OF UNION SCRAP	***SEE LOCATION DESCRIPTIO***	***NE 0 - 1/8 (0.072 mi.)***	***W201***	***547***
TWIN CITY STEEL TREATING CO IN	***1114 S 3RD ST***	***ENE 0 - 1/8 (0.073 mi.)***	***S205***	***551***
AMERICAN ACADEMY OF NEUROLOGY	201 CHICAGO AVENUE SOUT	NNE 0 - 1/8 (0.076 mi.)	Y207	555
MINNEAPOLIS STAR TRIBUNE CO MC	425 PORTLAND AVE	NNW 0 - 1/8 (0.079 mi.)	U224	583
STAR TRIBUNE	***425 PORTLAND AVE S***	***NNW 0 - 1/8 (0.079 mi.)***	***U225***	***584***
DPD PRINT MANAGEMENT - MINNEAP	903 WASHINGTON AVE S	NNE 0 - 1/8 (0.079 mi.)	AA227	615
PERISCOPE INC	***921 WASHINGTON AVE S***	***NE 0 - 1/8 (0.080 mi.)***	***AA232***	***621***
KRELITZ BUILDING	***251 PORTLAND AVE S***	***N 0 - 1/8 (0.087 mi.)***	***T245***	***630***
GUTHRIE THEATER AUXILIARY	***WASHINGTON AVE S & CHIC***	***NNE 0 - 1/8 (0.089 mi.)***	***Y246***	***639***

EXECUTIVE SUMMARY

Lower Elevation	Address	Direction / Distance	Map ID	Page
LEMAR COLOR LAB	241 PORTLAND AVE	N 0 - 1/8 (0.090 mi.)	T250	658
BRUCE PRINTING INC	***1001 WASHINGTON AVE S***	***NE 0 - 1/8 (0.094 mi.)***	***W256***	***667***
UNIVERSITY BANK BUILDING	***720 WASHINGTON AVE***	***N 0 - 1/8 (0.095 mi.)***	***Q257***	***669***
MINNESOTA CENTER FOR BOOK ARTS	1011 WASHINGTON AVE S S	NE 0 - 1/8 (0.097 mi.)	W262	680
GUTHRIE SCENE SHOP	***212 9TH AVE S***	***NNE 0 - 1/8 (0.098 mi.)***	***AA266***	***684***
NATIONAL GUARDIAN	***1229 S 6TH ST***	***ESE 0 - 1/8 (0.104 mi.)***	***AD273***	***706***
WASHINGTON AVENUE RAILROAD PRO	***SEE LOCATION DESCRIPTIO***	***NNE 0 - 1/8 (0.105 mi.)***	***Y274***	***708***
BLEK OIL	***1000 WASHINGTON AVE S***	***NE 0 - 1/8 (0.106 mi.)***	***W277***	***709***
THE STATION	***1010 WASHINGTON AVE S***	***NE 0 - 1/8 (0.109 mi.)***	***W279***	***723***
MINNEAPOLIS VETERINARY HOSPITA	1030 WASHINGTON AVE S	NE 0 - 1/8 (0.114 mi.)	AH297	784
PARCEL F	***SEE LOCATION DESCRIPTIO***	***NNE 0 - 1/8 (0.117 mi.)***	***Y298***	***785***

Financial Assurance: Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

A review of the Financial Assurance list, as provided by EDR, and dated 11/01/2012 has revealed that there are 61 Financial Assurance sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
FORMER WAREHOUSE	***406 CHICAGO***	***0 - 1/8 (0.000 mi.)***	***E69***	***92***
MCDA SITE	***4TH ST & KIRBY PUCKETT***	***0 - 1/8 (0.000 mi.)***	***C80***	***97***
MCGILL BUILDING	***501 PARK AVE***	***0 - 1/8 (0.000 mi.)***	***F85***	***105***
ECSU-5	***CHICAGO & 5TH***	***0 - 1/8 (0.000 mi.)***	***G87***	***117***
UNKOWN RP	***530 CHICAGO AVENUE***	***0 - 1/8 (0.000 mi.)***	***G94***	***124***
EXECUTIVE PARKING LOT - BLOCK	***NW CORNER OF 5TH ST & P***	***0 - 1/8 (0.001 mi.)***	***F96***	***129***
UNKNOWN	***5TH ST AND PARK AVE S***	***NNW 0 - 1/8 (0.001 mi.)***	***F97***	***133***
PROPOSED METRODOME LRT STATION	S 5TH ST & PARK AVE S	NW 0 - 1/8 (0.002 mi.)	F103	137
STAR TRIBUNE	***S 5TH ST & PARK AVE S***	***NW 0 - 1/8 (0.002 mi.)***	***F104***	***138***
XCEL ENERGY - PAD MOUNT TRANSF	***601 CHICAGO AVENUE***	***WNW 0 - 1/8 (0.005 mi.)***	***J146***	***372***
FORSENIC SCIENCE BUILDING	***530 CHICAGO AVE S***	***NW 0 - 1/8 (0.009 mi.)***	***G153***	***383***
HENNEPIN COUNTY PUBLIC WORKS -	***600 PARK AVE, 7TH & PAR***	***WNW 0 - 1/8 (0.035 mi.)***	***P166***	***411***
HENNEPIN COUNTY MEDICAL CENTER	***626 PARK AVE***	***WNW 0 - 1/8 (0.058 mi.)***	***P178***	***467***
JUVENILE JUSTICE CENTER	***626 S 6TH ST***	***WNW 0 - 1/8 (0.067 mi.)***	***V199***	***535***
METRODOME SQUARE BUILDING	***1010 S 7TH ST***	***SSE 0 - 1/8 (0.079 mi.)***	***Z219***	***575***
ST. BARNABAS	***906 7TH ST S***	***SSW 0 - 1/8 (0.079 mi.)***	***221***	***580***
UNKNOWN	***7TH & 11TH AVE***	***SSE 0 - 1/8 (0.079 mi.)***	***AC231***	***618***
CHURCH	***810 S 7TH ST***	***WSW 0 - 1/8 (0.080 mi.)***	***AB237***	***626***
DEPENDABLE GARAGE	***619 PORTLAND***	***WNW 0 - 1/8 (0.094 mi.)***	***V253***	***661***
HCMC - EAST BASEMENT	***717 CHICAGO AVENUE***	***WSW 0 - 1/8 (0.095 mi.)***	***AB258***	***677***
HOPE COMMUNITY CHURCH	***704 11TH AVE S***	***SSE 0 - 1/8 (0.109 mi.)***	***AC283***	***728***
OT	***PARK & 7TH***	***W 0 - 1/8 (0.110 mi.)***	***AG286***	***740***
HENNEPIN COUNTY MEDICAL CENTER	***701 PARK AVE S***	***W 0 - 1/8 (0.113 mi.)***	***AG292***	***752***

Lower Elevation	Address	Direction / Distance	Map ID	Page
FLEET SERVICE GARAGE - BLOCK 7	***716 S 4TH ST***	***0 - 1/8 (0.000 mi.)***	***C34***	***33***
STAR TRIBUNE	***716 S 4TH ST***	***0 - 1/8 (0.000 mi.)***	***C41***	***48***
EAGLE STANDARD	***728 S 4TH ST***	***0 - 1/8 (0.000 mi.)***	***C45***	***59***
TWIN CITY GEAR	***823 25 17TH AVE S***	***0 - 1/8 (0.000 mi.)***	***B51***	***74***
EAST CENTRAL PARKING RAMP	***425 PARK AVENUE***	***0 - 1/8 (0.000 mi.)***	***C53***	***78***
XCEL ENERGY - TRANSFORMER	***700 SOUTH 4TH STREET***	***0 - 1/8 (0.000 mi.)***	***C57***	***82***
STAR TRIBUNE PARKING LOT	***701 S 4TH ST***	***0 - 1/8 (0.000 mi.)***	***C66***	***87***
NORTHERN STATES POWER COMPANY	***4TH ST & PARK AVE***	***0 - 1/8 (0.001 mi.)***	***C95***	***127***

EXECUTIVE SUMMARY

Lower Elevation	Address	Direction / Distance	Map ID	Page
NORTHERN STATES POWER	*802 3RD ST S*	*NNE 0 - 1/8 (0.002 mi.)*	*L108*	*142*
THRESHER SQUARE	*708 S 3RD ST*	*N 0 - 1/8 (0.002 mi.)*	*D113*	*148*
LEVEL 3 MINNEAPOLIS	*511 11TH AVE S STE 210*	*ESE 0 - 1/8 (0.004 mi.)*	*I134*	*243*
AT&T MINNEAPOLIS MN0305	*511 11TH AVE S*	*ESE 0 - 1/8 (0.004 mi.)*	*I135*	*247*
HENNEPIN COUNTY ENERGY CENTER	*600 10TH AVE SO*	*SE 0 - 1/8 (0.004 mi.)*	*K140*	*303*
HENNEPIN COUNTY ENERGY CENTER	*600 10TH AVE S*	*SE 0 - 1/8 (0.004 mi.)*	*K142*	*319*
RITZ HOTEL (FORMER)	*3RD & 4TH ST*	*NNE 0 - 1/8 (0.005 mi.)*	*B144*	*369*
HENNEPIN COUNTY ENERGY CENTER	*ADDRESS UNKNOWN*	*SE 0 - 1/8 (0.006 mi.)*	*K149*	*378*
NORTHERN STATES POWER	*640 11TH AVE S*	*SE 0 - 1/8 (0.034 mi.)*	*M160*	*397*
VALSPAR	*1028 S 3RD ST*	*NE 0 - 1/8 (0.034 mi.)*	*O163*	*403*
XCEL ENERGY - TRANSFORMER	*1100 5TH STREET SOUTH*	*E 0 - 1/8 (0.055 mi.)*	*R171*	*430*
ELLIOT PARK SUBSTATION - NSP	*1100 5TH ST S*	*ESE 0 - 1/8 (0.056 mi.)*	*R174*	*441*
VALSPAR RESEARCH LAB	*312 11TH AVE S*	*ENE 0 - 1/8 (0.059 mi.)*	*S179*	*476*
VALSPAR CORPORATION (THE)	*312 SOUTH 11TH STREET*	*ENE 0 - 1/8 (0.059 mi.)*	*S180*	*481*
CARGILL	*616 S 3RD ST*	*NNW 0 - 1/8 (0.065 mi.)*	*T183*	*490*
AUGSBURG FORTNESS PRESS	*616 W 3RD ST*	*NNW 0 - 1/8 (0.065 mi.)*	*T186*	*498*
HIGHWAY	*3RD ST S AND 11ST AVE S*	*ENE 0 - 1/8 (0.065 mi.)*	*S187*	*500*
VALSPAR CORPORATION (THE)	*312 S 11TH AVE*	*ENE 0 - 1/8 (0.066 mi.)*	*S196*	*518*
RIVERSIDE PLAZA	*615 S 4TH ST*	*NNW 0 - 1/8 (0.067 mi.)*	*U197*	*531*
TWIN CITIES STEEL TREATING PLA	*1112 S 3RD ST*	*ENE 0 - 1/8 (0.072 mi.)*	*S203*	*548*
TWIN CITY STEEL TREATING CO IN	*1114 S 3RD ST*	*ENE 0 - 1/8 (0.073 mi.)*	*S205*	*551*
PARK AVENUE EXTENSION	PARK AVE & WASHINGTON A	NNE 0 - 1/8 (0.079 mi.)	Y220	579
STAR TRIBUNE	*425 PORTLAND AVE S*	*NNW 0 - 1/8 (0.079 mi.)*	*U225*	*584*
KRELITZ BUILDING	*251 PORTLAND AVE S*	*N 0 - 1/8 (0.087 mi.)*	*T245*	*630*
ZIEGLER BOR-SON JOB SITE (BY T	*S 9TH AVE & WASHINGTON*	*NNE 0 - 1/8 (0.090 mi.)*	*AA248*	*655*
UNIVERSITY BANK BUILDING	*720 WASHINGTON AVE*	*N 0 - 1/8 (0.095 mi.)*	*Q257*	*669*
GUTHRIE SCENE SHOP	*212 9TH AVE S*	*NNE 0 - 1/8 (0.098 mi.)*	*AA266*	*684*
BLEK OIL	*1000 WASHINGTON AVE S*	*NE 0 - 1/8 (0.106 mi.)*	*W277*	*709*
THE STATION	*1010 WASHINGTON AVE S*	*NE 0 - 1/8 (0.109 mi.)*	*W279*	*723*
TNT HOLLAND??	*WASHINGTON & PORTLAND*	*N 0 - 1/8 (0.110 mi.)*	*AF284*	*735*

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR US Hist Auto Stat: EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR US Hist Auto Stat list, as provided by EDR, has revealed that there are 33 EDR US Hist Auto Stat sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
STOLTE ELMER	801 S 4TH	0 - 1/8 (0.000 mi.)	E52	78
ARNESON ALF H	704 S 5TH	0 - 1/8 (0.000 mi.)	F61	85
RISLEY ALVA	500 CHICAGO AVE	0 - 1/8 (0.000 mi.)	G89	120

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RICHARD RUCAS	829 S 6TH	WNW 0 - 1/8 (0.002 mi.)	J101	136
DE BLE SERVICE GARAGE	817 S 6TH	WNW 0 - 1/8 (0.002 mi.)	G102	136
ZAHL EQUIPMENT CO	601 CHICAGO AVE	WNW 0 - 1/8 (0.005 mi.)	J145	372
ANDERSON JOSIAH REAR	615 S 6TH	WNW 0 - 1/8 (0.077 mi.)	V210	556
BOUCHER CHAS R REAR	816 S 7TH AVE	WSW 0 - 1/8 (0.079 mi.)	AB229	618
CRANKSHAFT SUPPLY CO	1121 S 7TH	SE 0 - 1/8 (0.094 mi.)	AE255	667
CRANKSHAFT SUPPLY CO	1121 S 7TH ST	SE 0 - 1/8 (0.095 mi.)	AE259	680
SUBURBAN AUTO ELECTRIC	606 12TH AVE S	SE 0 - 1/8 (0.096 mi.)	AE260	680

Lower Elevation	Address	Direction / Distance	Map ID	Page
MAC AND ANDY WASH RACK	716 S 4TH	0 - 1/8 (0.000 mi.)	C33	32
EAGLE STANDARD	728 S 4TH ST	0 - 1/8 (0.000 mi.)	C50	74
BERG NORENS A	717 S 3D	N 0 - 1/8 (0.002 mi.)	D105	141
LUNDBERG E J	1028 S 6TH	SE 0 - 1/8 (0.002 mi.)	K106	141
RANGE OIL SUPPLY CO	433 11TH AVE S	E 0 - 1/8 (0.002 mi.)	107	142
CORDELL AND NESS	701 S 4TH	NNW 0 - 1/8 (0.003 mi.)	C115	154
AUTOSMITH GARAGE	1101 S 5TH	ESE 0 - 1/8 (0.003 mi.)	I117	157
CARLSON SERVICES INC	1128 S 6TH ST	SE 0 - 1/8 (0.026 mi.)	M157	394
YOUNGSTEDT S STANDARD SERVICE	300 11TH AVE S	ENE 0 - 1/8 (0.063 mi.)	S182	489
WOLFE ALBERT REAR	610 S 5TH	NW 0 - 1/8 (0.072 mi.)	X202	548
WESTERN AUTO SALES CO	1124 S 3D	ENE 0 - 1/8 (0.076 mi.)	S209	556
ARNOLD FRANK	600 S 4TH	NNW 0 - 1/8 (0.080 mi.)	U238	629
KAMROW SARNML C	320 PORTLAND AVE	NNW 0 - 1/8 (0.080 mi.)	T239	629
Not reported	494 PORTLAND AVE	NW 0 - 1/8 (0.081 mi.)	X240	629
LUNDIN MARTIN G	1206 S 6TH	ESE 0 - 1/8 (0.086 mi.)	AD243	630
MALONE S AUTO WORKS	1235 S 5TH ST	ESE 0 - 1/8 (0.087 mi.)	R244	630
BEN S SERVICE	1000 WASHINGTON AVE S	NE 0 - 1/8 (0.106 mi.)	W275	709
STATION THE	1000 S WASHINGTON AVE	NE 0 - 1/8 (0.106 mi.)	W276	709
Not reported	1010 WASHINGTON AVE S	NE 0 - 1/8 (0.109 mi.)	W282	728
WASHINGTON PURE OIL STATION	1026 S WASHINGTON AVE	NE 0 - 1/8 (0.113 mi.)	AH295	783
HAW JOHN R	1026 WASHINGTON AVE S	NE 0 - 1/8 (0.113 mi.)	AH296	784
THEISTANDARD SERVICE	550 S 4TH	NNW 0 - 1/8 (0.118 mi.)	299	785

EDR US Hist Cleaners: EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR US Hist Cleaners list, as provided by EDR, has revealed that there are 11 EDR US Hist Cleaners sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PONG SAM	714 S 6TH	WNW 0 - 1/8 (0.035 mi.)	P168	428
FORSBERG ALPHA R	1101 S 7TH	SSE 0 - 1/8 (0.079 mi.)	AC230	618
SANG CHAS W	1122 S 7TH	SSE 0 - 1/8 (0.082 mi.)	AC241	629
BOULEVARD CLEANERS AND LAUNDER	720 11TH AVE S	SSE 0 - 1/8 (0.097 mi.)	AC261	680
LINCOLN LAUNDRY	722 11TH AVE S	SSE 0 - 1/8 (0.098 mi.)	AC268	687

Lower Elevation	Address	Direction / Distance	Map ID	Page
TUB THE	815 WASHINGTON AVE S	NNE 0 - 1/8 (0.077 mi.)	Y211	556

EXECUTIVE SUMMARY

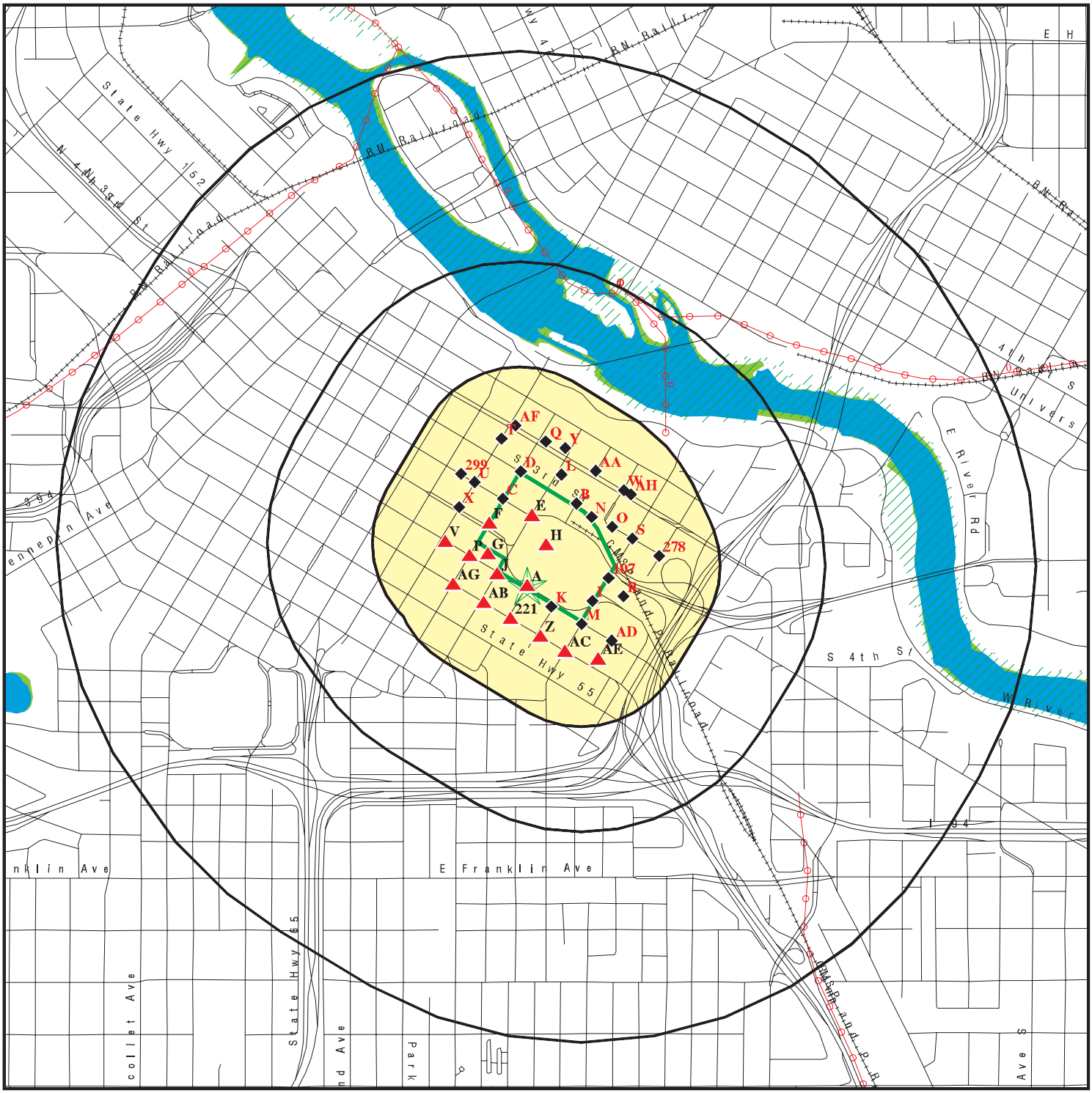
Lower Elevation	Address	Direction / Distance	Map ID	Page
DAHLGREN CLEANERS	714 WASHINGTON AVE S	N 0 - 1/8 (0.090 mi.)	Q249	658
WHITE LAUNDRY CO	1011 WASHINGTON AVE S	NE 0 - 1/8 (0.097 mi.)	W263	681
POLLARD WM	307 S 12TH	ENE 0 - 1/8 (0.108 mi.)	278	723
BACKSTROM MORGAN IT	614 WASHINGTON AVENUE S	N 0 - 1/8 (0.111 mi.)	AF287	742
BACKSTROM MORGAN R	614 S WASHINGTON AVE	N 0 - 1/8 (0.111 mi.)	AF288	743

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 39 records.

Site Name	Database(s)
DWORSKY BARREL (AKA DWORSKY/MCFARL	VIC,HWS,SRS
MNDOT I35W AND TH62 CORRIDOR PROJE	BROWNFIELDS,FINANCIAL ASSURANCE 1
MNDOT TH 55 AND 62 INTERCHANGE	BROWNFIELDS,FINANCIAL ASSURANCE 1
HENNEPIN CO LEAF RECYCLING/MINNETO	LF,FINANCIAL ASSURANCE 1
MSP AIRPORT NORTHWEST AIRLINES	SPILLS,FINANCIAL ASSURANCE 1
TRANSPORT INCORPORATED	SPILLS,FINANCIAL ASSURANCE 1
URBAN	SPILLS,FINANCIAL ASSURANCE 1
TWIN CITIES DIE CASTING CO	SPILLS,FINANCIAL ASSURANCE 1
NORTHERN CARGO	SPILLS,FINANCIAL ASSURANCE 1
MNDOT TRAFFIC ACCIDENT	SPILLS,FINANCIAL ASSURANCE 1
HIGHWAY	SPILLS,FINANCIAL ASSURANCE 1
LYLE GAMRATT TRUCKING CO	SPILLS,FINANCIAL ASSURANCE 1
NORTHERN STATES POWER	SPILLS,FINANCIAL ASSURANCE 1
MAC	SPILLS,FINANCIAL ASSURANCE 1
RURAL	SPILLS,FINANCIAL ASSURANCE 1
MORRELL TRANSFER	SPILLS,FINANCIAL ASSURANCE 1
CITY OF MPLS., DEVELOPMENT	SPILLS,FINANCIAL ASSURANCE 1
MIKES TRUCK AND TRAILER	SPILLS,FINANCIAL ASSURANCE 1
GREATLAND OIL COMPANY	SPILLS,FINANCIAL ASSURANCE 1
GOPHER OIL	SPILLS,FINANCIAL ASSURANCE 1
GROSS COMMON CARRIER	SPILLS,FINANCIAL ASSURANCE 1
HIGHWAY	SPILLS,FINANCIAL ASSURANCE 1
UNKNOWN	SPILLS,FINANCIAL ASSURANCE 1
TRUSSEL & TOWER	SPILLS,FINANCIAL ASSURANCE 1
UNKNOWN	SPILLS,FINANCIAL ASSURANCE 1
UNKNOWN	SPILLS,FINANCIAL ASSURANCE 1
UNKNOWN	SPILLS,FINANCIAL ASSURANCE 1
CHICAGO NORTHWESTERN RAILROAD	SPILLS,FINANCIAL ASSURANCE 1
UNION PACIFIC - EAST MINNEAPOLIS Y	SPILLS,FINANCIAL ASSURANCE 1
AIR FORCE RESERVE - MINNEAPOLIS	SPILLS,FINANCIAL ASSURANCE 1
AIR FORCE RESERVE BUILDING 812 - L	SPILLS,FINANCIAL ASSURANCE 1
SMITHWAY TRUCKING SPILL ON SHOULDE	SPILLS,FINANCIAL ASSURANCE 1
MNDOT STORM WATER POND ADJACENT TO	SPILLS,FINANCIAL ASSURANCE 1
NSP	SPILLS,FINANCIAL ASSURANCE 1
CONSTRUCTION SITE	SPILLS,FINANCIAL ASSURANCE 1
UNKNOWN	SPILLS,FINANCIAL ASSURANCE 1
CON-WAY FREIGHT -FRIDLEY	SPILLS,FINANCIAL ASSURANCE 1
OLD MONITORING SITE ADJ TO BOAT LA	SPILLS,FINANCIAL ASSURANCE 1
ROAD SIDE	SPILLS,FINANCIAL ASSURANCE 1

OVERVIEW MAP - 03540142.1r

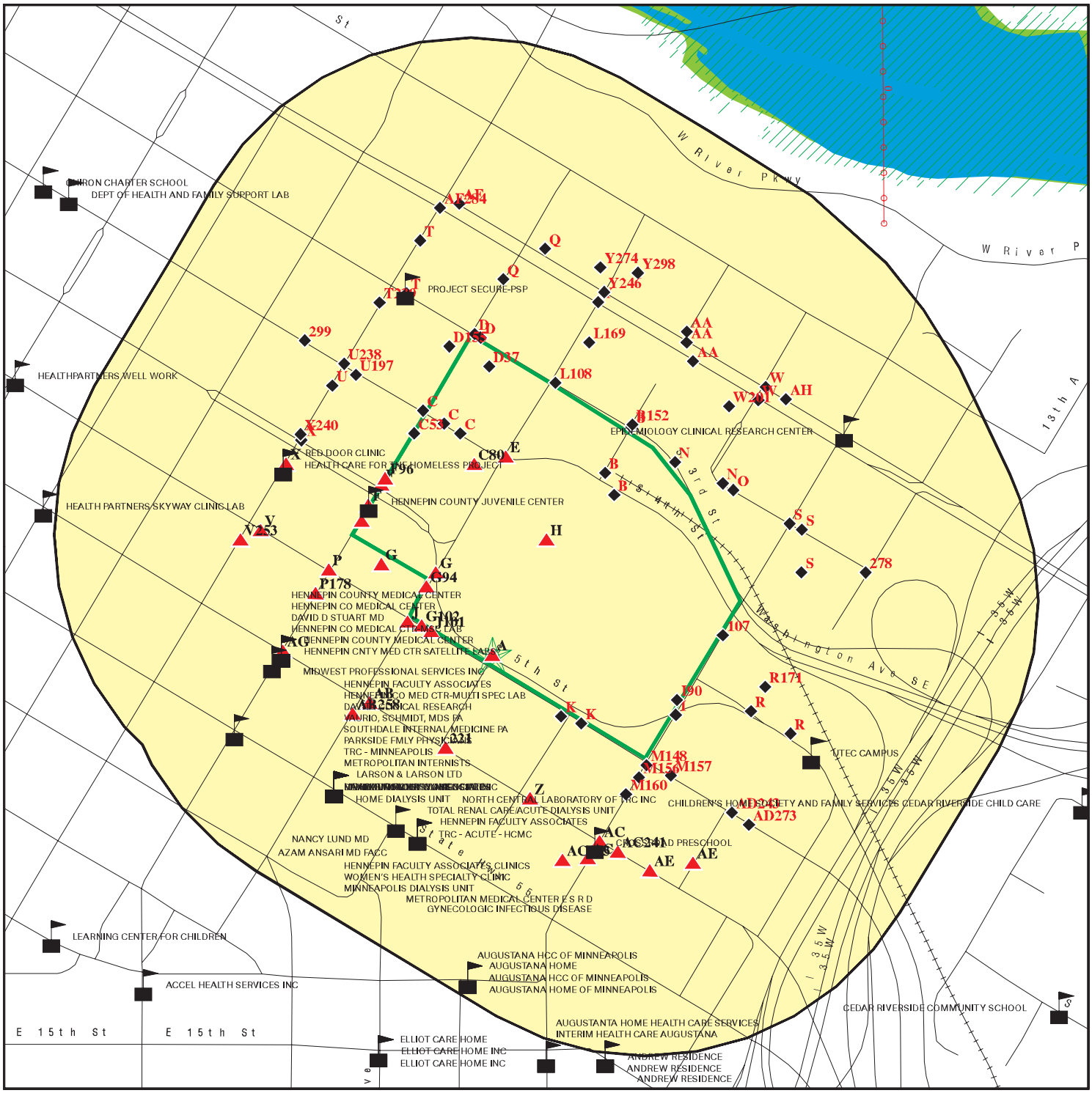


- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: The Peoples Stadium ADDRESS: 900 South 5th Street Minneapolis MN 55415 LAT/LONG: 44.9728 / 93.2591	CLIENT: American Engineering Testing CONTACT: Tracey Lee INQUIRY #: 03540142.1r DATE: March 11, 2013 4:12 pm

DETAIL MAP - 03540142.1r



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites

- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: The Peoples Stadium	CLIENT: American Engineering Testing
ADDRESS: 900 South 5th Street Minneapolis MN 55415	CONTACT: Tracey Lee
LAT/LONG: 44.9728 / 93.2591	INQUIRY #: 03540142.1r DATE: March 11, 2013 4:13 pm

Technical Memorandum of Environmental Review; Proposed Project Study Area for The People's Stadium

Purpose

American Engineering Testing, Inc. (AET) has performed a review of environmental conditions at the Proposed Project study area for the People's Stadium. AET performed this environmental review at the request of Kimley-Horn and Associates, Inc. (Kimley-Horn), as part of the Environmental Impact Statement (EIS). This Technical Memorandum summarizes AET's findings.

Scope

AET's scope consists of performing property-specific environmental reviews for each parcel within the Proposed Project study area. The review for each property is attached to this Memorandum, along with a map showing the property locations. The information on known and potential environmental conditions has been gathered from the following documentation available to AET at this time:

- Phase I Environmental Site Assessments (ESAs)
- Phase II ESAs or comparable investigations
- *The EDR Radius Map Report with Geocheck* [governmental database records search], Environmental Data Resources, Inc. (EDR); March 11, 2013 – see accompanying document
- *What's in My Neighborhood?* [on-line governmental database], Minnesota Pollution Control Agency (MPCA); accessed March 8, 2013
- AET requested various regulatory files from the MPCA on March 8, 2013. As of March 19, the files have not yet become available for AET to review.

Summary of identified environmental conditions in Proposed Project study area

The environmental review has identified contaminant impacts to soil, groundwater, and soil gas media on various properties within the Proposed Project study area. Contaminants include metals, petroleum, volatile organic compounds (VOCs), and other organic compounds such as polynuclear aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs). These findings are consistent with a range of identified historical operations.

The identified contaminant impacts to soil and other media result in an affected environment at the following properties within the Proposed Project study area:

- Block 71 – 300 9th Avenue South: VOCs, PAHs, and metals including barium, copper, and arsenic
- Block 73 – 424 Chicago Avenue South and 701 4th Street South (impacts in Light Rail Transit right-of-way adjacent to Block 73): petroleum
- Block 94 – 530 Chicago Avenue South: petroleum and PAHs
- Block 106 – 309 9th Avenue South: VOCs, PAHs, and metals including lead, copper, and arsenic
- Metrodome – 900 5th Street South: organic vapors (i.e., VOCs) and PCBs

The degree and distribution of contamination is not yet well defined throughout the Proposed Project study area. While contamination is not considered to be everywhere within the study area, it would be difficult to rule out contamination at any given location without further assessment.

Summary of findings in Cumulative Impacts Assessment area

At the request of Kimley-Horn, a more limited governmental database records search has been completed for the Cumulative Impacts Assessment area which consists of two city blocks bounded by Park Avenue, 5th Avenue, 4th Street, and 5th Street. The EDR report does not include that geographic area.

Based on AET's review, the identified contaminant impacts to soil and other media result in an affected environment at the following property within the Cumulative Impacts Assessment area:

- Block 74 – 425 Portland Avenue South: petroleum and VOCs

Analysis of environmental consequences, mitigation, and No Build Alternative

Environmental Consequences:
The environmental consequences of contamination in soil, groundwater, and soil gas media begin with potential risks to site workers, site users, or off-site receptors. The types, magnitudes, extents, and other characteristics of contamination conditions would require additional assessment to better define the potential risks to human health and the environment. Once more fully defined, the risks would require proper planning and mitigation during the site redevelopment process.

Even while the Proposed Project study area remains undisturbed, contamination may affect one or more environmental media at the same time. The coarse-grained natural soil deposits are considered susceptible to groundwater contamination and vapor migration if releases occur. To some degree, the prevalence of paved surfaces and thick fill in places serves to insulate the underlying natural soils and groundwater from contaminant migration. While it is possible that disturbance of the subsurface during the construction process would increase the mobilization of contamination, the anticipated redevelopment is not expected to alter the general soil conditions or enhance the potential for contaminant migration.

Mitigation:
In most cases, mitigation measures for environmental contamination in the State of Minnesota are undertaken in coordination with the MPCA. The Agency offers fee-for-service voluntary programs which can provide liability assurances to owners, prospective purchasers, or developers: Petroleum Brownfield Program (PBP) for petroleum contamination and Voluntary Investigation and Cleanup (VIC) program for non-petroleum impacts. Those voluntary programs operate in coordination with state regulatory programs such as Superfund and Petroleum

Remediation Program (PRP) to offer liability assurances consistent with both voluntary and regulatory statutes, rules, and policies. The voluntary programs offer users prescribed guidelines and using standardized approaches for investigation, response action planning, remediation, and monitoring of mitigation measures.

During site preparation and redevelopment, the presence of contamination and solid waste in fill soils may result in materials which must be properly managed to minimize risks. Soil management categories may include hazardous or solid waste for landfill disposal/management, regulated fill soil for disposal or potential reuse, unregulated fill soil for reuse or disposal, uncontaminated soil suitable or unsuitable for planned construction uses, and soil or bedrock which may remain *in situ*. Each waste management stream listed above may require unique permitting and documentation measures.

During construction dewatering, the discharge or sanitary sewer disposal of potentially contaminated waters may require advanced planning, permitting, pre-treatment, or other management measures.

The presence of the identified environmental impacts to soil, groundwater, and soil gas media would require enhanced diligence during planning and construction to manage risks associated with contaminated media, to coordinate waste stream management, to confirm the presence and degree of risks, and to mitigate any residual risks which are not remediated.

No Build Alternative:
If the No Build Alternative is selected, the contaminated media would remain undisturbed. The mitigation measures to engage regulatory authorities and to manage the waste stream would not be necessary.

Given the limited scope of previous environmental assessments, the degree of inherent risk from *in situ* contamination is not certain. The potential would remain for contaminant migration to affect human health and the environment at affected properties and potentially off-site.

Other potential environmental hazards during demolition and construction

Affected Environment:
Solid Waste:
Since the Proposed Project would involve complete demolition of a sports stadium, outlying facilities, neighboring buildings, city streets, and underground infrastructure, it is anticipated that large quantities of demolition debris and earth materials would be generated during demolition. Demolition debris is inert material such as concrete, brick, bituminous, glass, plastic, untreated wood, and rock.

AET has been notified by Kimley-Horn that Mortenson Construction estimates the demolition would generate 80,000 tons of concrete debris, 2,600 tons of separated steel, and 3,500 tons of

miscellaneous demolition debris, of which 95% to 98% would be recycled. The remainder would be disposed at a state permitted landfill.

Construction of the new stadium would generate construction related waste materials such as wood, packaging, excess materials, and other wastes, which would be either recycled or disposed. Stadium operations would generate solid wastes such as food waste, packaging, beverage containers, paper, and other wastes, similar to the current stadium operation.

Hazardous and Regulated Waste:
Hazardous waste is not anticipated to be generated during demolition of the existing stadium, except through abatement and removal of regulated materials such as asbestos, lead-based paint, refrigeration equipment, lights, or other regulated wastes if they are identified. As part of the development process, a pre-demolition survey would be completed on the existing structures to determine the environmental hazards that could be encountered during demolition of the existing Metrodome and in removing and disposing of construction debris from the Metrodome site.

Site preparation for the new stadium would generate large quantities of earth materials (100,000 cubic yards or more) which would require proper management or disposal. The environmental review has identified potential contamination in soil and water within the Proposed Project study area, which would require advanced planning for proper management and disposal of impacted materials.

Stadium operations customarily use small quantities of petroleum and other toxic or hazardous substances, which would be properly managed and disposed per state and local regulations and guidelines. The EDR report identifies the current Metrodome property as a Small Quantity Generator of Waste Code D1 "ignitable hazardous wastes" amounting to less than 100kg per calendar month. These types of *de minimis* uses do not typically lead to regulated waste releases, discharges or emissions. One or more storage tanks may be used for storage of fuel for such purposes as a standby electric generator. The EDR report identifies the current Metrodome property as a registered Underground Storage Tank facility with two 1,000-gallon tanks containing diesel fuel. Registered storage tanks are required to comply with federal and state regulations for installation and system monitoring.

Environmental Consequences:
Solid Waste:
If solid waste recycling falls short of the 95% to 98% projections, the Proposed Project would require disposal of solid waste materials at area landfills, thereby shortening the operating life of those facilities. Handling, transportation, and disposal of solid wastes generated during the demolition, site preparation, and construction phases of the Proposed Project would also result in transient environmental consequences in the areas of: traffic; vehicle-related air emissions; odors, noise, and dust; soil conditions; surface water runoff; erosion and sedimentation; and visual impacts.

Stadium operations would generate solid wastes on an ongoing basis, similar to the current stadium.

Hazardous and Regulated Waste:
If hazardous or regulated waste materials are discovered during demolition of the existing stadium, those materials are required to be handled through established federal and state abatement, mitigation, disposal, and recycling procedures. If hazardous or regulated wastes are misidentified or mismanaged, there is a potential for releases to the environment.

Site preparation for the Proposed Project would result in excavated soils which are contaminated and would require disposal at area landfills. The consequences would be identical to those stated above for solid waste.

Stadium operation would generate small quantities of hazardous wastes on an ongoing basis, similar to the current stadium as described above.

Mitigation:
Solid Waste:
Mitigation measures for the identified potential environmental hazards associated with solid waste during demolition and construction include the following:

- Solid waste materials generated during demolition, site preparation, and construction must be disposed in a MPCA approved demolition landfill, or separated and recycled. Management of solid waste would be in accordance with state regulations and guidelines.
- To the extent feasible, demolition debris and salvaged materials would be segregated into alternate waste streams for recycling/reuse:
    - Much of the concrete would be crushed for reuse on- or off-site as aggregate fill material.
    - Soils meeting MPCA unregulated fill criteria may also be reused.
    - Steel and other metals would be salvaged and recycled.
    - A plan for solid waste stream management would be prepared for the project which would emphasize recycling/reuse of demolished materials to the extent feasible.
- For the stadium operations phase, a recycling center would be designed and constructed to encourage recycling of metals, plastics, paper, and other materials. Wastes that cannot be recycled would be managed in accordance with state regulations and guidelines.

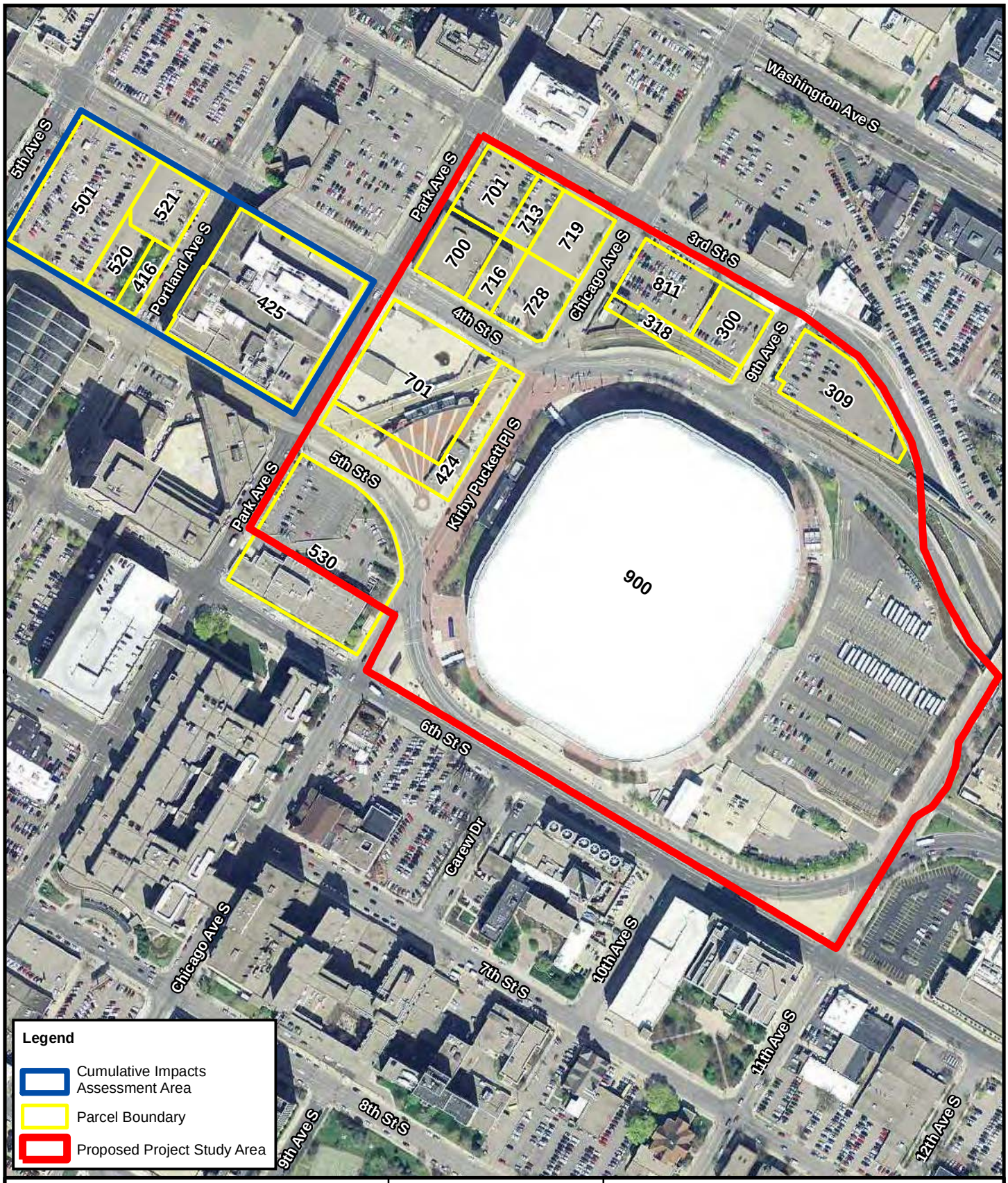
Hazardous and Regulated Waste:
Mitigation measures for the identified potential environmental hazards associated with hazardous and regulated waste during demolition and construction include the following:

- Any buildings to be removed for the project would be inspected for hazardous and regulated materials and these materials would be abated/removed prior to demolition. The removed hazardous wastes would be managed and recycled/disposed by certified contractors according to regulatory and industry standards.
- Any hazardous and regulated waste generated during construction would be managed according to federal, state, and local regulations and guidelines. Construction hazardous waste generation would be minimized by specifying non-hazardous materials where possible.

- Any contaminated soil or water discovered during assessments or removed during the construction would be managed according to state and local regulations and guidelines as well as industry practice:
    - Disposal of low-level-contaminated soils would occur at an acceptable regulated fill soil site or MPCA-approved landfill.
    - Disposal of higher-level-contaminated soils would occur at an MPCA-approved sanitary landfill.
    - Contaminated water recovered during construction (e.g., during dewatering) would be treated by a qualified contractor to state standards, prior to a permitted discharge event.
- If previous unknown regulated materials/wastes are discovered during construction, the Contractor would notify the Project Engineer immediately. The Project Engineer would notify regulatory authorities as required and take appropriate actions to manage the regulated materials or wastes.
- It is expected that temporary aboveground storage tanks (ASTs) would be utilized on-site to store petroleum products and other materials during construction.
    - Any storage tanks would be protected with secondary containment and designed to meet all regulatory requirements including spill and overfill protection, leak monitoring, corrosion protection, etc.
    - These tanks would be monitored on a regular basis and spill containment would be incorporated into the design of the tanks.
    - Spill containment and cleanup materials would be stored on-site to contain and cleanup small spills.
- If abandoned underground storage tanks (USTs) or other storage structures are encountered during site preparation activities, they and their contents would be assessed, removed, and disposed according to MPCA and local regulations and guidelines.
- A management plan would be developed for the project to minimize impacts to soils and groundwater in the event a release of hazardous substances occurs during construction. If a release were to occur, the MPCA, Minnesota Department of Health (MDH), and/or Department of Public Safety (MDPS) would be contacted immediately.
- To the extent feasible alternative non-hazardous materials would be used for facility maintenance to minimize generation of hazardous and regulated wastes resulting from facility operations.

No Build Alternative:
If the No Build Alternative is selected, additional solid waste would not be generated for disposal. The mitigation measures to manage solid, hazardous, and regulated waste would continue for the existing Metrodome as occurs today.

Given the limited scope of previous environmental assessments and building pre-demolition inspections, the degree of inherent risk from land use environmental hazards is not certain. The potential would remain for disturbance or neglect within the Proposed Project study area to affect human health and the environment at affected properties and potentially off-site.



AMERICAN ENGINEERING TESTING, INC

Map Reference:
U.S. Geological Survey and Digital Aerial Solutions, LLC: USGS High Resolution Orthoimagery, Minneapolis-St. Paul, Minnesota, Spring 2012

N

0 150 300

Feet

Figure 1

Proposed Project Location Map

The People's Stadium
Minneapolis, Minnesota

Date: 03/18/2013 AET Project No. 02-02015

File: Peoples.mxd Date: 03/18/2013

Property-Specific Environmental Review
Proposed Project Study Area for
The People's Stadium

Block 70 - 700 4th Street South

Background Information

- The property is currently owned and occupied by a Star Tribune facility and parking lot.
- According to Environmental Database Resources, Inc. (EDR) and the Minnesota Pollution Control Agency (MPCA) public online resource "What's in My Neighborhood?" the property is not identified in regulatory databases. Many of the surrounding properties are identified.
- A review of historical fire insurance maps revealed various businesses occupied the property including a paper company, storage warehouse, and railroad operations.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property.

Block 70 - 701 3rd Street South

Background Information

- The property is currently owned and occupied by a Star Tribune facility and parking lot.
- According to Environmental Database Resources, Inc. (EDR) and the Minnesota Pollution Control Agency (MPCA) public online resource "What's in My Neighborhood?" the property is not identified in regulatory databases. Many of the surrounding properties are identified.
- A review of historical fire insurance maps revealed various businesses occupied the property including a sheet metal shop, wagon shop, and railroad operations.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property.

Block 70 - 713 3rd Street South

Background Information

- The property is currently owned and occupied by a Star Tribune facility and parking lot.
- According to Environmental Database Resources, Inc. (EDR) and the Minnesota Pollution Control Agency (MPCA) public online resource "What's in My Neighborhood?" the property is not identified in regulatory databases. Many of the surrounding properties are identified.
- A review of historical fire insurance maps revealed various businesses occupied the property including a sheet metal shop and railroad operations.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property.

Block 70 - 716 4th Street South

Background Information

- The property is currently owned and occupied by a Star Tribune facility and parking lot.
- According to Environmental Database Resources, Inc. (EDR) and the Minnesota Pollution Control Agency (MPCA) public online resource "What's in My Neighborhood?" the property is identified in regulatory databases.
    - Tank Site 2785
    - Hazardous Waste, Small to Minimal Quantity Generator (QG)
- A review of historical fire insurance maps revealed various businesses occupied the property including a carpenter shop and railroad operations.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property.

Block 70 - 719 3rd Street South

Background Information

- The property is currently owned and occupied by a Star Tribune facility and parking lot.
- According to Environmental Database Resources, Inc. (EDR) and the Minnesota Pollution Control Agency (MPCA) public online resource "What's in My Neighborhood?" the property is not identified in regulatory databases. Many of the surrounding properties are identified.
- A review of historical fire insurance maps revealed various businesses occupied the property including a tin and plating shop, welding, and railroad operations.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property.

Block 70 - 728 4th Street South

Background Information

- The property is currently owned and occupied by a Star Tribune facility and parking lot.
- According to Environmental Database Resources, Inc. (EDR) and the Minnesota Pollution Control Agency (MPCA) public online resource "What's in My Neighborhood?" the property is identified in regulatory databases.
    - Tank Site 2868
    - Hazardous Waste, Small to Minimal Quantity Generator (QG)
- A review of historical fire insurance maps revealed various businesses occupied the property including a tin shop, business college, high school, machine shop, and railroad operations.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property.

Block 71 - 300 9th Avenue South

Background Information

- The property is currently occupied by a paved parking lot used for hourly and contract parking.
- Subsurface investigations conducted by EnPro Assessment Corporation (EnPro) in 1990 and Braun Intertec Corporation (Braun) in 2007 encountered fill soils to 14 feet and identified low concentrations of volatile organic compounds (VOCs) and polynuclear aromatic hydrocarbons (PAHs) below regulatory limits. Elevated concentrations of barium, arsenic, and copper exceeded regulatory limits in three soil samples collected. The groundwater sample collected was analyzed for PAHs and did not exhibit concentrations above regulatory limits.
- Due to the elevated levels of PAHs and metals identified in fill soils and historical uses of the property and adjacent sites, Braun recommended the property be enrolled in the Minnesota Pollution Control Agency (MPCA) Voluntary Investigation and Cleanup (VIC) program.
- A Phase I Environmental Site Assessment (ESA) conducted by AET in 2012 identified historical businesses (filling station, automobile dealership, and electroplating business) adjacent to the property a recognized environmental condition.
- According to Environmental Database Resources, Inc. (EDR) and the MPCA public online resource "What's in My Neighborhood?" the property is identified in regulatory databases.
    - VIC Site VP2240
        - Program participation dates are listed as May 30, 1990 through March 17, 1999.
        - A Limited No Further Action Letter was sent on October 9, 1990.
- A Petroleum Brownfields (PB) site assumed to be associated with the construction of Norm McGrew Place adjacent to the property was identified.
    - PB Site 3521 (Park Avenue Extension)
- A review of historical fire insurance maps revealed residential dwellings and a parking lot occupied the property. Adjacent land use includes filling stations, foundry, ironworks, and railroad operations.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property. AET requested a file review for the above-mentioned VIC and PB sites. These files have not been made available yet.

Block 71 - 318 9th Avenue South

Background Information

- The property is currently occupied by Hiawatha light rail tracks and associated maintenance facilities.
- According to Environmental Database Resources, Inc. (EDR) and the Minnesota Pollution Control Agency (MPCA) public online resource "What's in My Neighborhood?" the property is not identified in regulatory databases. Many of the surrounding properties are identified.
- A review of historical fire insurance maps revealed various businesses occupied the property including a bottling company, plumbing & heating company, box factory, liquor warehouse, auto garage, and railroad operations.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property.

Block 71 - 811 3rd Street South

Background Information

- The property is currently occupied by a paved parking lot used for hourly and contract parking.
- A Phase I Environmental Site Assessment (ESA) conducted by AET in 2012 identified historical businesses (filling station, automobile dealer and electroplating business) adjacent to the property a recognized environmental condition.
- According to Environmental Database Resources, Inc. (EDR) and the MPCA public online resource "What's in My Neighborhood?" the property is not identified in regulatory databases. Many of the surrounding properties are identified.
- A review of historical fire insurance maps revealed residential use of the property and a piping warehouse. Adjacent land use includes a bottling company, a parking lot, plumbing & heating company, box factory, liquor warehouse, auto garage, and railroad operations.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property.

Block 73 - 424 Chicago Avenue

Background Information

- The property is currently occupied by a concourse for the Metrodome Sports Facility with Hiawatha light rail tracks intersecting the property at the northeast and southwest corners.
- According to Environmental Database Resources, Inc. (EDR) and the Minnesota Pollution Control Agency (MPCA) public online resource "What's in My Neighborhood?" the property is not identified in regulatory databases.
- A Petroleum Brownfields (PB) and leak site assumed to be associated with the construction of the light rail intersecting the property was identified.
    - PB Site 3323 (Proposed Metrodome LRT Station)
        - The site is located at 5th Street South and Park Avenue South.
    - Leak Site 14208 (MCDA Site)
        - The site is located at 4th Street South and Kirby Puckett Place.
        - A release of an unknown substance was reported in May 2001. 222 cubic yards of soil was excavated from the property. It is unknown if contaminated soils remain on site.
        - The MPCA granted site closure on November 24, 2004.
- A review of historical fire insurance maps revealed various businesses occupied the property including a machine shop, carpentry, furniture factory, and printing company.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property. AET requested a file review for the above-mentioned PB and leak sites. These files have not been made available yet.

Block 73 - 701 4th Street South

Background Information

- The property is currently occupied by a parking lot with Hiawatha light rail tracks intersecting the property from the northeast to the southwest corner.
- According to Environmental Database Resources, Inc. (EDR) and the Minnesota Pollution Control Agency (MPCA) public online resource "What's in My Neighborhood?" the property is identified in regulatory databases.
    - Leak Site 13494
        - Impacted soils from a fuel oil underground storage tank (UST) were discovered when soils were excavated to 30 feet below ground surface (bgs) for construction of a parking garage. All contaminated soils were removed.
        - The MPCA granted site closure on October 15, 2007.
- A Petroleum Brownfields (PB) and leak site assumed to be associated with the construction of the light rail intersecting the property were identified.
    - PB Site 3323 (Proposed Metrodome LRT Station)
        - The site is located at 5th Street South and Park Avenue South.
    - Leak Site 14208 (MCDA Site)
        - The site is located at 4th Street South and Kirby Puckett Place.
        - A release of an unknown substance was reported in May 2001. 222 cubic yards of soil was excavated from the property. It is unknown if contaminated soils remain on site.
        - The MPCA granted site closure on November 24, 2004.
- A review of historical fire insurance maps revealed various businesses occupied the property including a machine shop, carpentry, furniture factory, and printing company.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property. AET requested a file review for the above-mentioned PB and leak sites. These files have not been made available yet.

Block 74 - 425 Portland Avenue

Background Information

- The property consists of a five-story structure with a basement, parking lots, and a subterranean storage room located north of Block 74 and under South 4th Street. The subterranean storage room is located at 350 Park Avenue and is connected to the basement of the Star Tribune office building that is located on the subject property.
- A Phase I Environmental Site Assessment (ESA) conducted by URS in 2007 identified lead-laden dust as a recognized environmental condition. The Star Tribune's historic operations included lead-smelting. A lead dust cleanup was conducted in the building; however lead-laden dust is reported to remain in the ceiling and ductwork in the basement.
- According to Environmental Database Resources, Inc. (EDR) and the Minnesota Pollution Control Agency (MPCA) public online resource "What's in My Neighborhood?" the property is identified in regulatory databases.
    - Leak Site 1584
        - Impacted soil was observed during the removal of three underground storage tanks (USTs) in 1989. Five cubic yards was excavated and analysis revealed no soil impacts.
        - Soil borings were advanced to 30 feet below ground surface (bgs) to collect soil samples. Analytical results were non-detect for benzene, toluene, ethylbenzene, and xylene (BTEX), total hydrocarbons (THC) as gasoline and THC as fuel oil.
        - The MPCA granted site closure on May 10, 1990.
    - Leak Site 7981
        - A release was discovered during the removal of two 6,000-gallon fuel oil USTs.
        - The MPCA granted site closure on December 19, 1995.
    - Tank Site 2687
    - Hazardous Waste, Small to Minimal Quantity Generator (QG) - Active
- A review of historical fire insurance maps revealed various businesses occupied the property including a lumber yard, machine shop, painting, blacksmith, and a printing and publishing facility.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property. AET requested a file review for the above-mentioned leak sites. These files have not been made available yet.

Block 75 - 416 Portland Avenue

Background Information

- The property is currently paved and operated as a parking lot.
- A Phase I Environmental Site Assessment (ESA) conducted by URS in 2007 identified no recognized environmental conditions relative to the property.
- According to Environmental Database Resources, Inc. (EDR) and the Minnesota Pollution Control Agency (MPCA) public online resource "What's in My Neighborhood?" the property is not identified in regulatory databases. Many of the surrounding properties are identified.
- A review of historical fire insurance maps revealed various businesses occupied the property including a machine shop, manufacturing company, and engraving facility.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property.

Block 75 - 501 4th Street South

Background Information

- The property is currently paved and operated as a parking lot.
- A Phase I Environmental Site Assessment (ESA) conducted by URS in 2007 identified no recognized environmental conditions relative to the property.
- According to Environmental Database Resources, Inc. (EDR) and the Minnesota Pollution Control Agency (MPCA) public online resource "What's in My Neighborhood?" the property is not identified in regulatory databases. Many of the surrounding properties are identified.
- An underground storage tank (UST) removal report referenced by URS indicated four USTs associated with a former filling station were removed from the property in 1989. Soil sampling and analysis did not detect benzene, toluene, ethylbenzene, and xylene (BTEX) or total petroleum hydrocarbons (TPH). Lead was detected at concentrations below MPCA action levels.
- A review of historical fire insurance maps revealed various businesses occupied the property including a machine shop, printing and publishing facilities, laundry company, an auto repair shop, rubber stamp manufacturing, a clothing factory, and a filling station.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property.

Block 75 - 520 5th Street South

Background Information

- The property is currently paved and operated as a parking lot.
- A Phase I Environmental Site Assessment (ESA) conducted by URS in 2007 identified no recognized environmental conditions relative to the property.
- According to Environmental Database Resources, Inc. (EDR) and the Minnesota Pollution Control Agency (MPCA) public online resource "What's in My Neighborhood?" the property is not identified in regulatory databases. Many of the surrounding properties are identified.
- A review of historical fire insurance maps revealed various businesses occupied the property including municipal storage and repair shops.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property.

Block 75 - 521 4th Street South

Background Information

- The property is currently paved and operated as a parking lot.
- A Phase I Environmental Site Assessment (ESA) conducted by URS in 2007 identified no recognized environmental conditions relative to the property.
- According to Environmental Database Resources, Inc. (EDR) and the (MPCA) public online resource "What's in My Neighborhood?" the property is not identified in regulatory databases. Many of the surrounding properties are identified.
- A review of historical fire insurance maps revealed various businesses occupied the property including machine shops, painting, printing, and bindery.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property.

Block 94 - 530 Chicago Avenue

Background Information

- The property is currently occupied by the Hennepin County Forensic Sciences Building and the McGill parking lot.
- A Phase I Environmental Site Assessment (ESA) conducted by AET in 2012 identified the following recognized environmental conditions:
    - Petroleum contamination associated with the removed/replaced underground storage tank (UST) at the property and the former UST at 501 Park Avenue.
    - Releases of petroleum products associated with nearby and/or up-groundwater gradient sites.
    - Release potential associated with historical businesses at the property.
    - Fill soils exist at the property.
    - Release potential associated with previous and existing elevator hoists.
- A Phase II ESA conducted by AET in 2012 identified fill soils up to 10 feet thick containing demolition debris. Fill soil on the property is impacted with diesel range organics (DRO) and polynuclear aromatic hydrocarbons (PAHs) above regulatory limits.
- According to Environmental Database Resources, Inc. (EDR) and the Minnesota Pollution Control Agency (MPCA) public online resource "What's in My Neighborhood?" the property and associated addresses are identified in regulatory databases.
    - Tank Site 2114 (530 Chicago Avenue)
    - Tank Site 2091; Hazardous Waste, Small to Minimal Quantity Generator (QG) – Inactive (501 Park Avenue)
    - Hazardous Waste, Small to Minimal QG - Active (531 Park Avenue)
- A review of historical fire insurance maps revealed various businesses occupied the property including a lumber yard, electroplating, engraving, laundry, painting, printing, binding and lithography, and a filling station.

Assessment

Based on previous assessments conducted by AET and historical property use, it is expected that contamination will be encountered during redevelopment of the property.

Block 106 - 309 9th Avenue South

Background Information

- The property is currently occupied by a paved parking lot used for hourly and contract parking.
- Subsurface investigations conducted by EnPro Assessment Corporation (EnPro) in 1992 and Braun Intertec Corporation (Braun) in 2007 encountered fill soils to 15 feet and identified low concentrations of volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), and metals below regulatory limits. Elevated concentrations of arsenic, copper, and lead exceeded regulatory limits in two samples collected. Groundwater samples did not exhibit concentrations above regulatory limits, with the exception of one trichloroethene (TCE) concentration slightly above its respective Minnesota Department of Health (MDH) Health Risk Limit (HRL).
- Due to the elevated levels of VOCs, PAHs and metals identified in fill soils and historical uses of the property and adjacent sites, Braun recommended the property be enrolled in the Minnesota Pollution Control Agency (MPCA) Voluntary Investigation and Cleanup (VIC) program.
- According to Environmental Database Resources, Inc. (EDR) and the MPCA public online resource "What's in My Neighborhood?" the property is identified in regulatory databases.
    - VIC Site VP3060
        - The program participation dates are listed as May 14, 1992 through December 25, 1996.
- A Petroleum Brownfields (PB) site assumed to be associated with the construction of Norm McGrew Place was identified.
    - PB Site 3521 (Park Avenue Extension)
- A review of historical fire insurance maps revealed various businesses occupied the property including a foundry, piping yard, machine shop, and railroad operations.

Assessment

It is not certain that contamination will be encountered during redevelopment of the property. Since the property is located in a mature commercial business district, the potential exists for past spills or releases of hazardous materials and/or petroleum products by the former businesses on or adjacent to the property. AET requested a file review of the above-mentioned VIC and PB sites. These files have not been made available yet.

Metrodome Sports Facility - 900 5th Street South

Background Information

- The property is currently occupied by the Hubert H. Humphrey Metrodome and parking lot, which is owned and operated by the Minnesota Sports Facilities Authority.
- AET conducted geotechnical exploration and review in 2007, 2008, and 2013. The geologic profile at the property consists of fill, overlying alluvial and glacially deposited overburden soils down to bedrock, which is dolomitic limestone of the Platteville Formation. Glenwood Formation appears beneath the Platteville Formation, below which, St. Peter Sandstone exists to a substantial depth.
- Overburden soils consist of coarse alluvium (sand to silty sand) and glacial till (silty sand with some clayey sand and sandy lean clay).
- Petroleum odors were encountered in a soil boring at the property approximately 20 feet below ground surface (bgs) in February 2013. Organic vapors were detected in samples from 27 to 31 feet ranging in concentrations of 23 to 45 ppm. The source, degree, and extent are unknown.
- According to Environmental Database Resources, Inc. (EDR) and the Minnesota Pollution Control Agency (MPCA) public online resource "What's in My Neighborhood?" the property is identified in regulatory databases.
    - Tank Site 18117 (HHH MetroDome)
    - Spills (Xcel-Pad Mount Transformer)
        - An estimated five gallon release of mineral oil leaking from a transformer was reported. A transformer change out was performed and the spill was cleaned up.
        - Spill Closure: Response Completed.
    - Hazardous Waste, Small to Minimal Quantity Generator (QG) – Active (HHH MetroDome)
    - Hazardous Waste, Small to Minimal QG – Inactive (Fuji Photo Film)
- A review of historical fire insurance maps revealed residential dwellings and various businesses occupied the property and adjacent sites including a morgue, machine shop, ironworks, hospital, filling stations, and railroad operations.

Assessment

Based on previous assessments conducted by AET and historical property use, it is expected that contamination will be encountered during redevelopment of the property.

Appendix C
List of Acronyms

List of Acronyms

AADT	Annual Average Daily Traffic
ADA	Americans with Disabilities Act
AET	American Engineering Testing, Inc.
APE	Area of Potential Effect
B3	Minnesota Sustainable Building Guidelines
BMP	Best Management Practice
CCLRT	Central Corridor Light Rail Transit
CRU	Cultural Resource Unit
dB	decibels
dBA	A-weighted decibels
DNR	Minnesota Department of Natural Resources
Draft EIS	Draft Environmental Impact Statement
EAW	Environmental Assessment Worksheet
EIS	Environmental Impact Statement
EPA	US Environmental Protection Agency
EQB	Environmental Quality Board
ESA	Environmental Site Assessment
ETFE	ethylene tetrafluoroethylene
FC	foot-candle
FHWA	Federal Highway Administration
Final EIS	Final Environmental Impact Statement
GIS	Geographic Information Systems
gpm	gallons per minute
HCMC	Hennepin County Medical Center
kV	kilovolt
L_{10}	The noise level that is exceeded for a total of 10% of an hour (six minutes).
L_{50}	The noise level that is exceeded for a total of 50% of an hour (30 minutes).
LEED	Leadership in Energy and Environmental Design
LOS	Level of Service
LRT	Light Rail Transit
MCES	Metropolitan Council Environmental Services
MEPA	Minnesota Environmental Protection Act

MEQB	Minnesota Environmental Quality Board
MCES	Metropolitan Council Environmental Services
MDH	Minnesota Department of Health
MDPS	Minnesota Department of Public Safety
mgd	million gallons per day
Minn. Stat.	Minnesota Statutes
MLS	Major League Soccer
MnDOT	Minnesota Department of Transportation
MnDOT CRU	Minnesota Department of Transportation Cultural Resources Unit
MPCA	Minnesota Pollution Control Agency
MSAT	Mobile Source Air Toxics
MSFA	Minnesota Sports Facilities Authority
MSFC	Metropolitan Sports Facilities Commission
MWMO	Mississippi Watershed Management Organization
NAAQS	National Ambient Air Quality Standards
NAC	Noise Area Classification
NCAA	National Collegiate Athletic Association
NFL	National Football League
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSA	Noise Sensitive Area
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
RFFAs	Reasonably Foreseeable Future Actions
RGU	Responsible Governmental Unit
SDD	Scoping Decision Document
sf	square feet
SHPO	State Historic Preservation Office
TDMP	Travel Demand Management Plan
TSS	total suspended solids
VOCs	volatile organic compounds
vph	vehicles per hour
vplph	vehicles per lane per hour
WMO	Watershed Management Organization