Appendix A

Water Resource Related Agreements

REVISED AND RESTATED

JOINT POWERS AGREEMENT
ESTABLISHING A WATERSHED MANAGEMENT ORGANIZATION
FOR THE LOWER MISSISSIPPI RIVER WATERSHED

THE PARTIES TO THIS AGREEMENT ("Agreement") are Members of the Lower Mississippi River Watershed Management Organization and have land that drain surface water into the Mississippi River. This Agreement amends and restates the original Joint Powers Agreement between the Members which became effective in 1985 and includes all prior Amendments to the 1985 Joint Powers Agreement. This Agreement is made pursuant to the authority conferred upon the parties by Minn. Stat. §§ 471.59 and 103B.201 - 103B.252.

SECTION 1. NAME AND LEGAL BOUNDARY. The parties hereby establish the Lower Mississippi River Watershed Management Organization, hereinafter referred to as the "WMO." The "Legal Boundary Map of the Lower Mississippi River Watershed Management Organization" is attached hereto as Exhibit A.

SECTION 2. PURPOSE. The purpose of this Agreement is to provide an organization to regulate the natural water storage and retention of the Lower Mississippi watershed to:

A. Protect, preserve, and use natural surface and ground water storage and retention systems;

B. Minimize public capital expenditures needed to correct flooding and water quality problems;

C. Identify and plan for means to effectively protect and improve surface and ground water quality;

D. Establish more uniform local policies and official controls for surface and ground water management;

E. Prevent erosion of soil into surface water systems;

F. Promote ground water recharge;

G. Protect and enhance fish and wildlife habitat and water recreational facilities;

H. Secure the other benefits associated with the proper management of surface and ground water; and

I. Carry out all the duties and responsibilities in Minn. Stat. §§ 471.59 and 103B.201 - 103B.252.

SECTION 3. DEFINITIONS.

Subdivision 1. *"Allowable Flow"* means the rate and volume of flow, according the to design criteria set forth in the Watershed Management Plan, at which a Member community may discharge into the drainage system without financial obligation and as the rate and volume of surface water runoff from a tributary area under natural conditions, with a drainage system in place which has been designed and constructed according to the criteria stated herein, excluding diverted waters. Current topographic data that exists on the enactment date of this Agreement shall be used for the determination of the natural conditions and calculation of the allowable flow.

Subdivision 2. *"Board"* means the board of managers of the WMO.

Subdivision 3. *"Council"* means the governing body of a governmental unit which is a Member of this WMO.

Subdivision 4. *"Drainage Facilities"* means any improvement constructed for the conveyance or storage of surface water.

Subdivision 5. *"Drainage System"* means the combination of drainage facilities required to safely control or convey runoff water from a major tributary drainage area(s) to a point of final discharge into a water body.

Subdivision 6. *"Excessive Flow"* means that rate and volume of flow, calculated according to the design criteria in the Watershed Management Plan, from a Member which is in excess of the allowable flow of that Member.

Subdivision 7. *"Governmental Unit"* means any city.

Subdivision 8. *"Lower Mississippi River Watershed"* or *"Watershed"* means the area contained within the "Legal Boundary Map of the Lower Mississippi River Water Management Organization" attached hereto as Exhibit "A".

Subdivision 9. *"Manager"* means the representative appointed to the Board by a Member.

Subdivision 10. *"Member"* means a governmental unit which enters into this Agreement.

Subdivision 11. *"Natural Conditions"* means the characteristics of the land on the date of enactment without regard to any urban development including structures, parking lots, or other artificial improvements.

Subdivision 12. *"Rate of Flow"* means the discharge of surface water runoff as a function of time which has been calculated according to the design criteria identified in the Watershed Management Plan. The rate of flow shall apply to the design and construction of open channels and storm sewer conduits.

Subdivision 13. *"Volume of Flow"* means the total discharge of all surface water runoff which has been calculated according to the design criteria identified in the Watershed Management Plan. The volume of runoff flow shall apply to the design and construction of detention facilities.

Subdivision 14. *"Watershed Management Organization"* or *"WMO"* means the organization created by this Agreement the full name of which is "Lower Mississippi River Watershed Management Organization." It shall be a public agency of its Members.

SECTION 4. MEMBERSHIP. The Membership of the WMO shall consist of the following governmental units, each entitled to the following eligible votes:

Member	Votes
City of Inver Grove Heights	3 votes
City of Lilydale	1 vote
City of Mendota Heights	2 votes
City of Saint Paul	2 votes
City of South Saint Paul	2 votes
City of Sunfish Lake	1 vote
City of West Saint Paul	2 votes

No change in governmental boundaries, structure, organizational status, or character shall affect the eligibility of any governmental unit listed above to be represented on the WMO, so long as such governmental unit continues to exist as a separate political subdivision. A majority of all eligible votes shall be sufficient for all matters, unless otherwise provided for in this Agreement. A majority vote of all Members, with each Member having one vote, shall be required for Section 7. A Member may not cast a split vote. Any Member that fails to contribute their share of the WMO annual administration fund or their allocation of a capital improvement cost, shall be declared ineligible for voting on all matters before the Board, until such contribution is made to the WMO.

SECTION 5. ADVISORY COMMITTEES.

Subdivision 1. Technical Advisory Committee. The following governmental subdivisions or agencies shall be requested to appoint a non-voting advisory Member to the WMO: Dakota County, Ramsey County, Dakota County Soil and Water Conservation District. The advisory Members shall not be required to contribute funds for the operation

of the WMO, except as provided in Minn. Stat. § 103B.251, but may provide technical services.

Subdivision 2. Citizen Advisory Committee. The WMO may establish a citizen advisory committee ("CAC") from the public at large to provide input on Watershed Management Plan revisions and other matters as deemed appropriate. The CAC shall be appointed by the WMO considering individuals nominated by each Member. The WMO will notify each Member of its intent to establish a CAC, will specify the purpose and duration of the CAC, and will request each Member to nominate candidates to be considered for appointment by the WMO. At the time of establishment of a CAC, the WMO will appoint a chair of the CAC, a board member liaison to the CAC, establish a time for submittal of any comments, and specify the support the WMO will provide to the CAC.

SECTION 6. BOARD OF MANAGERS.

Subdivision 1. Appointment. The governing body of the WMO shall be its Board. Each Member shall be entitled to appoint one Manager and an alternate on the Board. The alternate shall have the right to vote in the absence of their representative. Vacancies in the office of Manager shall be filled for the remainder of the term by the Member which appointed or had the right to appoint the Manager. All vacancies shall be filled within ninety (90) days after they occur.

Subdivision 2. Eligibility or Qualification. The Council of each Member shall determine the eligibility or qualification of its representative on the WMO.

Subdivision 3. Term. The Managers shall not have a fixed term, but shall serve at the pleasure of the Member appointing such Manager to the Board.

Subdivision 4. Removal. A Manager may not be removed from the Board prior to the expiration of his or her term, unless the Manager consents in writing or unless removed in accordance with the procedures provided under Minnesota Rules 8410.0040.

Subdivision 5. Compensation. Managers shall serve without compensation from the WMO, but this shall not prevent a Member from providing compensation for its Manager.

Subdivision 6. Organizational Meeting. At the first meeting of the Board each year, the Board shall elect from its Managers a chair, a vice chair, a secretary/treasurer, and such other officers as it deems necessary to conduct its meetings and affairs. The Board shall adopt rules of order and procedure governing its meetings and affairs. The rules of order and procedure may be amended from time to time at either a regular or a special meeting of the Board provided that at least ten (10) days' prior notice of the proposed amendment has been furnished to each person to whom notice of the Board meetings is required to be sent. A majority vote of all eligible votes of the Members of the WMO shall be sufficient to adopt any proposed amendment to such rules of order and procedure.

Subdivision 7. Annual Meeting Requirement. The Board shall meet at least annually, at times and places selected by the Board. If the Board changes its regularly established meeting place or time, it shall place a notice of the change on a bulletin board at least three (3) days in advance in the building where it was scheduled to meet.

Subdivision 8. Committees. The Board may establish committees as it deems appropriate.

Subdivision 9. Quorum. The Board shall not take any action without a quorum present. A quorum shall be at least four Members.

SECTION 7. POWERS AND DUTIES OF THE WMO. The WMO, acting by its Board:

Subdivision 1. Shall prepare, adopt and implement a Watershed Management Plan meeting the requirements of Minn. Stat. § 103B.231;

Subdivision 2. Shall review and approve local water management plans as provided in Minn. Stat. § 103B.235;

Subdivision 3. Shall exercise the authority of a watershed district under Minn. Stat. Chapter 103D to regulate the use and development of land in the watershed when one or more of the following conditions exist:

A. The local government unit exercising planning and zoning authority over the land under Minn. Stat. §§ 366.10 to 366.19, 394.21 to 394.37, or 462.351 to 462.364 does not have a local water management plan approved and adopted in accordance with requirements of Minn. Stat. § 103B.235 or has not adopted the implementation program described in the plan.

B. An application to the local government unit for a permit for the use and development of land, requires an amendment to, or variance from, the adopted local water management plan or implementation program of the local unit.

C. The local government unit has authorized the WMO to require permits for the use and development of land.

Subdivision 4. Shall adopt an annual work plan.

Subdivision 5. May employ such persons as it deems necessary to accomplish its duties and powers.

Subdivision 6. May contract for space and for material and supplies to carry on its activities either with a Member or elsewhere.

Subdivision 7. May acquire necessary personal and real property to carry out its powers and its duties.

Subdivision 8. May make necessary surveys or use other reliable surveys and data, and develop projects to accomplish the purposes for which the WMO is organized.

Subdivision 9. May cooperate or contract with the State of Minnesota or any subdivision thereof or federal agency or private or public organization to accomplish the purposes for which it is organized.

Subdivision 10. May order any governmental unit to carry out the local water management plan which has been approved by the Board. If the local unit of government fails to do so, in addition to other remedies, in its discretion, the Board may implement any required action or improvement in accordance with this Agreement.

Subdivision 11. May acquire, operate, construct, and maintain the capital improvements delineated in the Watershed Management Plan adopted by the Board.

Subdivision 12. May contract for or purchase such insurance as the Board deems necessary for the protection of the WMO and its Board.

Subdivision 13. May establish and maintain devices for acquiring and recording hydrological and water quality data within the watershed area of the WMO.

Subdivision 14. May enter upon lands within or without the watershed to make surveys and investigations to accomplish the purposes of the WMO.

Subdivision 15. May provide any Member with technical data or any other information of which the WMO has knowledge which will assist the Member in preparing land use classifications or local water management plans within the watershed.

Subdivision 16. May provide legal and technical assistance in connection with litigation or other proceedings between one or more of its Members and any other political subdivision, commission, board, corporation, individual, or agency relating to the

planning or construction of facilities to drain or pond storm waters or relating to water quality within the WMO.

Subdivision 17. May accumulate reserve funds for the purposes herein mentioned and may invest funds of the WMO not currently needed for its operations.

Subdivision 18. May collect money, in accordance with the provisions of this Agreement, from its Members and from any other source approved by the Board.

Subdivision 19. May make contracts, incur expenses, and make expenditures necessary and incidental to the effectuation of its purposes and powers.

Subdivision 20. Shall cause to be made an annual audit of the books and accounts of the WMO and shall make and file a report to its Members at least once each year including the following information:

A. The financial condition of the WMO;

B. The status of all WMO projects and work within the watershed; and

C. The business transacted by the WMO and other matters which affect the interests of the WMO. Copies of the report shall be transmitted to the clerk of each Member by March 31 of each year.

Subdivision 21. Shall make the WMO's books, reports, and records available for and open to inspection by its Members or the public at all reasonable times.

Subdivision 22. May recommend changes in this Agreement to its Members. Any amendments shall require ratification by all the parties to this Agreement.

Subdivision 23. May exercise all other powers necessary and incidental to the implementation of the purposes and powers set forth herein and as authorized by Minn. Stat. §§ 103B.201 through 103B.252.

Subdivision 24. Must solicit proposals for all legal, engineering, auditing, and other technical services in accordance with Minnesota Statutes § 103B.227, subd. 5.

Subdivision 25. Shall coordinate its planning activities with contiguous watershed management organizations and counties conducting water planning and implementation under Minn. Stat. Chapter 103B.

Subdivision 26. Shall designate one or more legal newspapers of general circulation which are published in the county(ies) in which the watershed is located.

SECTION 8. POWERS AND DUTIES OF THE OFFICERS OF THE BOARD.

Subdivision 1. It shall be the duty of the Chair of the Board to:

A. Attend and preside at all meetings of the Board;

B. Assist in the preparation of meeting agendas and the annual work plan;

C. See that orders and resolutions of the Board are carried into effect;

D. Sign and execute documents as may be required for the Board's exercise of its powers, except as otherwise required by law; and

E. Perform such other duties applicable to the office as are necessary to fulfill the powers and duties of the Board as set forth in this Agreement, and as provided by law.

Subdivision 2. It shall be the duty of the Vice Chair of the Board to:

A. Perform the duties of the Chair in the Chair's absence; and

B. Perform other duties as assigned from time to time by the Board.

Subdivision 3. It shall be the duty of the Secretary/Treasurer of the Board to:

A. Keep and post a true and accurate record of the proceedings of all meetings of the Board;

B. Keep a record of all amendments, alterations and additions to this Agreement;

C. Prepare and process all correspondence;

D. Prepare and file all reports and statements as required by law and this Agreement;

E. Keep all financial accounts of the WMO, and prepare and present to the Board full and detailed financial statements of the WMO prior to its annual meeting; and

F. Perform other duties as assigned from time to time by the Board.

SECTION 9. CONSTRUCTION OF IMPROVEMENTS.

Subdivision 1. All construction, reconstruction, extension or maintenance of WMO improvements, including outlets, lift stations, dams, reservoirs, or appurtenances of a surface water or storm sewer system ordered by the WMO which involve potential construction by or assessment against any Member or against privately or publicly owned land within the watershed shall adhere to the following procedures set forth in this section. The Board shall secure from its engineers or some other competent person a preliminary report advising it whether the proposed improvement is feasible, whether there are feasible alternatives, whether the proposed improvement shall best be made as proposed or in conjunction with some other improvement, a determination of the quantity and/or quality of storm and surface water contributed to the improvement by each Member, the estimated cost of the improvement(s), including maintenance, the estimated cost to each Member, and evaluating the consistency of the improvement with the Watershed Management Plan capital improvement section. The Board shall then hold a public hearing on the proposed improvement. Notice of the hearing shall be mailed to the clerk of each affected Member and shall also be published in the Board's official newspaper(s). The notice shall be mailed not less than forty-five (45) days before the hearing, shall state the time and place of the hearing, the general nature of the improvement, the estimated total cost, and the estimated cost to each Member.

To order the improvement, a resolution setting forth the order shall require a favorable majority vote of all eligible votes of the Members of the WMO. The order shall

describe the improvement, shall allocate in percentages the cost allocation among the Members, shall determine the method of financing, shall designate the engineers to prepare plans and specifications, and shall designate the entity that will contract for the improvement. The Board shall not order and no engineer shall prepare plans and specification before the Board has adopted a resolution ordering the improvement. After the Board has ordered an improvement, it shall forward the preliminary report to all affected Members with an estimated time schedule for the construction of the improvement.

The Board shall allow not less than 90 days, nor more than 270 days, for each Member to conduct hearings as provided by law or applicable charter requirements, to approve the construction and the method of financing of the improvement which the Member will use to pay its proportionate share of the costs of the improvement.

If the WMO proposes to use Dakota County's and/or Ramsey County's bonding authority, or if the WMO proposes to certify all or any part of an improvement to Dakota and/or Ramsey County for payment, then and in that event all proceedings shall be carried out in accordance with Minn. Stat. § 103B.251.

The Board may order advertising for bids upon receipt of notice from each Member which will be assessed that it has completed its hearing or determined its method of payment, or upon expiration of 270 days after the mailing of the preliminary report to the Members, whichever occurs first.

Subdivision 2. Any Member aggrieved by the determination of the Board as to the financing of an improvement or allocation of the costs of an improvement shall have thirty (30) days after the WMO resolution ordering the improvement to appeal the determination to arbitration. The appeal shall be in writing requesting the arbitration and

shall be addressed to the Board in c/o City of South St. Paul, 125 3rd Ave. N., South St. Paul, MN 55075. The determination of the Member's appeal shall be referred to a Board of Arbitration. The Board of Arbitration shall consist of three (3) persons: one to be appointed by the Board, one to be appointed by the appealing Member, and the third to be appointed by the two so selected. In the event the two persons so selected do not appoint the third person within fifteen (15) days after their appointment, then the chief judge of the District Court of Dakota County shall have jurisdiction to appoint, upon application of either or both of the two earlier selected, the third person to the Board of Arbitration. The third person selected shall not be a resident of any Member and if appointed by the chief judge, shall be a person knowledgeable in the subject matter of the dispute. The arbitrators' expenses and fees, together with the other expenses, not including counsel fees, incurred in the conduct of the arbitration shall be divided equally between the WMO and the appealing Member. Arbitration shall be conducted in accordance with the Uniform Arbitration Act, Minn. Stat. Chapter 572. Arbitration must be completed within the 270 day period provided for in Subdivision 1 of this Section.

Subdivision 3. Contracts for Improvements. The bidding and contracting of the work may be let by any Member or by the WMO as determined by the Board, in compliance with state statutes. Contracts and bidding procedures shall comply with all legal requirements.

Subdivision 4. Supervision. All improvement contracts shall be supervised by the entity awarding the contract. A WMO representative shall also be authorized to observe and review the work in progress and the Members agree to cooperate with the WMO representative in accomplishing the WMO's purposes. Representatives of the WMO shall have the right to enter upon the place or places where the improvement work is in

progress for the purpose of making reasonable tests and inspections. The WMO representative shall report to the Board on the progress of the work.

Subdivision 5. Land Acquisition. The WMO shall not have the power of eminent domain. All easements or interest in land which are necessary for an improvement will be negotiated or condemned in accordance with Minn. Stat. Chapter 117 by the Member where the land is located, and each Member agrees to acquire the necessary easement or right-of-way or partial or complete interest in land upon order of the Board to accomplish the purposes of this Agreement. All reasonable costs of the acquisition, including attorney's and appraiser's fees, shall be a cost of the improvement, and shall be allocated according to the formula for allocating Capital Improvement cost in Section 10, Subdivision 7. If a Member determines it is in its best interests to acquire additional rights in lands for some other purposes, in conjunction with the taking of lands for the improvement, the costs of the acquisition of additional rights in lands will not be included in the improvement costs. The Board, in determining the amount of the improvement costs to be assessed to each Member, may take into consideration the land use for which the additional lands are being acquired and may credit the acquiring Member for the land acquisition to the extent that it benefits the other Members. Any credits may be applied to the cost allocation of the improvement, or the Board, if feasible and necessary, may defer the credits to a future improvement.

Members may not condemn or negotiate for land acquisition to pond or drain storm and surface waters within the corporate boundaries of another Member within the WMO.

SECTION 10. FINANCES.

Subdivision 1. Disbursements. The WMO funds may be expended by the Board in accordance with this Agreement in a manner determined by the Board. The Board shall designate one or more national or state bank or trust companies authorized to receive deposits of public monies to act as depositories for the WMO funds. In no event shall there be a disbursement of WMO funds without approval by the Board and the signature of at least two (2) Board Members, one of whom shall be an officer. The Board may require the secretary/treasurer to file with the Board a bond in the sum of at least $10,000 or such higher amount as shall be determined by the Board. The WMO shall pay the premium on said bond.

Subdivision 2. Budget. On or before July 1 of each year, the Board shall adopt a general fund budget ("Budget") by a majority vote of all Members (with each Member having one vote) for the ensuing year and decide upon the total amount necessary for the general fund. The secretary/treasurer of the Board shall certify the Budget to the clerk of each Member, together with a statement of the proportion of the Budget to be provided by each Member, computed in accordance with Section 10, Subdivision 5. The council of each Member shall review the Budget, and the Board shall upon notice from any Member received prior to August 1, hear objections to the Budget, and may, upon notice to all Members of the time, date, place of and right to participate in the hearing and after a hearing, modify or amend the Budget, and then give notice to the Members of any and all modifications or amendments. Each Member agrees to provide the funds required by the Budget by February 15th of each year.

If a Member fails to provide its share of the funds required by the Budget by February 15 of each year, the unpaid balance of the funds shall accrue interest at a rate of

eight percent (8%) per annum commencing the day following February 15th of the year in which the funds were due. The WMO may take whatever action, at law or in equity it deems appropriate, to collect any amounts due from a Member under this Agreement. The Member agrees to pay the cost of collection, including reasonable attorneys' fees.

Subdivision 3. Maintenance. The Board shall have the option of funding maintenance work through the Budget, or funding as a capital improvement in accordance with Subdivision 6 of this Section. Maintenance costs that are associated with an improvement in the approved Capital Improvement Program, shall be allocated according to the same formula as is applicable for allocating capital improvement costs as identified in Section 10, Subdivision 7. The Members affected by the improvement shall decide on the level of maintenance to be applied to the improvement. If the Members cannot agree, the Board shall make the determination.

Subdivision 4. Tax Levy. If authorized by law, the WMO may levy a tax. The proceeds of any tax levied under this subdivision shall be expended only for the purposes authorized by law. The WMO may accumulate the proceeds of levies as an alternative to issuing bonds to finance improvements.

Subdivision 5. General Fund. Each Member agrees to contribute each year to a general fund to be used for general administration purposes including, but not limited to: improvement projects, salaries, rent, supplies, development of an overall plan, insurance, bonds, and to purchase and maintain devices to measure hydrological and water quality data. The funds may also be used for any other purpose authorized by this Agreement. The annual contribution by each Member shall be based fifty percent (50%) on taxable market value (for the preceding year) and fifty percent (50%) on area in accordance with the following formula:

Annual Watershed Levy = L

Taxable Market Value of a
Member's Property in the Watershed = MV

Taxable Market Value of All Property in the Watershed = TV

Acres of Property a Member Has in the Watershed = A

Total Acres in Watershed = TA

Member Required Contribution = C

$$\frac{1}{2} L \times \frac{MV}{TV} + \frac{1}{2} L \times \frac{A}{TA} = C$$

Subdivision 6. Capital Improvement.

A. All capital improvements ordered by the Board must be included in the WMO's adopted capital improvement program. An improvement fund shall be established for each improvement ordered by the WMO. If ordered by the Board, each Member agrees to contribute to the funds its proportionate share of the engineering, legal, and administrative costs as determined by the amount to be assessed against each Member as a cost of the improvement. The Board shall submit in writing a statement to each Member, setting forth in detail the expenses incurred by the WMO for each improvement.

Each Member further agrees to pay its proportionate share of the cost of the improvement in accordance with the determination of the Board, under Section 10, Subdivision 7. The Board or the Member awarding the contract shall submit in writing copies of the engineer's certificate authorizing payment during construction and the Member being billed agrees to pay its share of the costs within thirty (30) days after receipt of the statement. The Board may also require payment from Members before awarding a contract based upon an engineer's estimate of cost. Billings will then be adjusted when actual costs are known. The Board or the Member awarding the contract shall advise other contributing Members of the tentative time schedule of the work and the estimated times when the contributions shall be necessary.

B. Notwithstanding the provisions of paragraph (A) of this Subdivision, the WMO may also fund all or any part of the cost of a capital improvement contained in the capital improvement program of the plan in accordance with Minn. Stat. § 103B.251. The WMO and Dakota County and/or Ramsey County may establish a maintenance fund to be used for normal and routine maintenance of an improvement constructed in whole or in part with money provided by Dakota and/or Ramsey County pursuant to Minn. Stat. § 103B.251. The levy and collection of an ad valorem tax levy for maintenance shall be by Dakota and/or Ramsey County based upon a tax levy resolution adopted by the WMO and remitted to the

county(ies) on or before October 1 of each year. If it is determined to levy for maintenance, the WMO shall be required to follow the hearing process established by Minn. Stat. §103D.921. Mailed notice shall also be sent to the clerk of each Member at least thirty (30) days prior to the hearing.

C. The WMO may also fund all or any part of the cost of a capital improvement contained in the capital improvement program of the plan in accordance with Minn. Stat. § 103B.241.

Subdivision 7. Capital Cost Allocation of Improvements in the Board's Watershed Management Plan. All capital improvement costs of improvements designated in the WMO's adopted Watershed Management Plan for construction by the WMO pursuant to Section 10, Subdivision 6A of this Agreement shall be apportioned by the following methods or a combination of these methods:

A. For improvements related to water quality:

1. For water quality monitoring, water quality trend analyses, water quality modeling, and water quality studies, the cost sharing will be proportional to the tributary watershed area.

2. For water quality projects and maintenance, the cost sharing will be based on Allowable Flow, tributary area, and/or relative phosphorus loading.

3. The cost sharing for WMO operation of a future Watershed Outlet Monitoring Program station, or other program that monitors the quality of the stormwater runoff that discharges into the Mississippi River from the WMO, will be proportional to the tributary watershed area.

4. Or other cost sharing method approved by the Board.

5. Pursuant to Minn. Stat. § 103B.251.

B. For improvements related to water quantity:

1. A Member shall be responsible for the costs of construction of that portion of a drainage system that is located within its borders and that is necessary to accommodate its Allowable Flow and the Allowable Flow of all other tributary Members.

2. A Member shall also be responsible for its share of construction costs of a drainage system, whether or not that system is located within its borders, that is necessary to convey Excessive Flows originating within the Member's borders.

3. Increased costs of construction incurred for acquisition of lands, easements and rights of way within natural watercourses shall be the obligation of the Member in which the land lies and shall not be apportioned to other Members to the extent that such costs exceed costs which would have been incurred if there had been no improvement on such lands, easements, or rights of way.

4. Costs of construction shall include all costs associated with a WMO approved improvement (whether trunk sewer or natural conveyance) and whether or not actually constructed, including, but not limited to, costs for design, administration, construction supervision, legal fees, acquisition of lands and improvements and actual construction and maintenance costs.

5. The WMO shall consider any grant money received or to be received by a Member for sanitary sewer/storm sewer separation or for the construction, reconstruction or replacement of storm sewer facilities before making cost allocations among Members and may consider the application of any grant proceeds toward the cost of the improvement before allocating costs between or among the Members involved, provided that such allocation would not violate the terms and conditions of the grant.

6. The attached Exhibit B is incorporated by reference and serves as a compilation of general examples of cost allocation under this Agreement for the hypothetical circumstances stated in the examples.

Subdivision 8. Capital Cost Allocation of Improvements Delineated in Local Watershed Management Plans. All capital improvement costs incurred by the WMO for improvements delineated in local watershed management plans that benefit only that Member, which the WMO undertakes because the Member fails to do so, shall be apportioned entirely to that Member.

SECTION 11. SPECIAL ASSESSMENTS. The WMO shall not have the power to levy special assessments. All such assessments shall be levied by the Member within which the land is located.

SECTION 12. DURATION.

Subdivision 1. Each Member agrees to be bound by the terms of this Agreement until January 1, 2012. It may be continued thereafter upon the agreement of all the parties.

Subdivision 2. This Agreement may be terminated prior to January 1, 2012, by the written agreement of a majority of the Members.

Subdivision 3. In addition to the manner provided in Subdivision 2 for termination, any Member may petition the Board to dissolve the WMO. Upon thirty (30) days' notice in writing to the clerk of each Member, the Board shall hold a hearing and upon a favorable majority vote of all eligible votes of the Members, the Board may by resolution recommend that the WMO be dissolved. The resolution shall be submitted to each Member and if ratified by a majority of the governing bodies of all Members within sixty (60) days, the Board shall then give ninety (90) days written notice of its intent to dissolve the WMO to Dakota County, Ramsey County and the Board of Water and Soil Resources. After the expiration of this 90-day notice period, the Board shall dissolve the WMO, allowing a reasonable time to complete work in progress and to dispose of personal property owned by the WMO.

SECTION 13. DISSOLUTION. Upon dissolution of the WMO or termination of this Agreement, all property of the WMO shall be sold and the proceeds thereof, together with monies on hand, shall be distributed to the Members. Such distribution of WMO assets shall be made in proportion to the total contribution to the WMO required by the last annual Budget.

SECTION 14. EFFECTIVE DATE. This Agreement shall be in full force and effect when all seven (7) Members file a certified copy of a resolution approving this Agreement and have executed this Agreement and filed the executed Agreement with the Board. All Members need not sign the same copy.

IN WITNESS WHEREOF, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minn. Stat. § 471.59.

Approved by the City Council
September 26, 20 01.

CITY OF INVER GROVE HEIGHTS

BY: _____

Attest: _____

Approved by the City Council
April 28, 2003.

CITY OF LILYDALE

BY: _____

Attest: William L. Hawkes

Approved by the City Council
_____, 20____.

CITY OF MENDOTA HEIGHTS

BY: _____

Attest: _____

Approved by the City Council
_____, 20____.

CITY OF ST. PAUL

BY: _____

Attest: _____

Approved by the City Council
_____, 20____.

CITY OF SOUTH ST. PAUL

BY: _____

Attest: _____

IN WITNESS WHEREOF, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minn. Stat. § 471.59.

Approved by the City Council
_____, 20____.

CITY OF INVER GROVE HEIGHTS

BY: _____

Attest: _____

Approved by the City Council
_____, 20____.

CITY OF LILYDALE

BY: _____

Attest: _____

Approved by the City Council
November 20, 2001.

CITY OF MENDOTA HEIGHTS

BY: Charles E. Matthews

Attest: Linda L. Shipton

Approved by the City Council
_____, 20____.

CITY OF ST. PAUL

BY: _____

Attest: _____

Approved by the City Council
_____, 20____.

CITY OF SOUTH ST. PAUL

BY: _____

Attest: _____

IN WITNESS WHEREOF, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minn. Stat. § 471.59.

Approved by the City Council
_____, 20____.

CITY OF INVER GROVE HEIGHTS

BY: _____

Attest: _____

Approved by the City Council
_____, 20____.

CITY OF LILYDALE

BY: _____

Attest: _____

Approved by the City Council
_____, 20____.

CITY OF MENDOTA HEIGHTS

BY: _____

Attest: _____

Approved by the City Council
JANUARY 16, 20 02.
COUNCIL FILE #02-52

Approved as to Form:

BY: Lisa A. Veith
Assistant City Attorney

CITY OF ST. PAUL

BY: Dennis J. Rahkola
Randy Kelly, Mayor

Approved by the City Council
_____, 20____.

CITY OF SOUTH ST. PAUL

BY: _____

Attest: _____

IN WITNESS WHEREOF, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minn. Stat. § 471.59.

Approved by the City Council
_____, 20____.

CITY OF INVER GROVE HEIGHTS

BY: _____

Attest: _____

Approved by the City Council
_____, 20____.

CITY OF LILYDALE

BY: _____

Attest: _____

Approved by the City Council
_____, 20____.

CITY OF MENDOTA HEIGHTS

BY: _____

Attest: _____

Approved by the City Council
_____, 20____.

CITY OF ST. PAUL

BY: _____

Attest: _____

Approved by the City Council
November 5, 2001.

CITY OF SOUTH ST. PAUL

BY: Kathleen A Gaylord

Attest: Christy M. Wilcox

Approved by the City Council
12/4, 20 01.

CITY OF SUNFISH LAKE

BY: _____

Attest: _____, Clerk

Approved by the City Council
_____, 20____.

CITY OF WEST ST. PAUL

BY: _____
Its Mayor

BY: _____
Its City Manager

Approved by the City Council
_____, 20____.

CITY OF SUNFISH LAKE

BY: _____

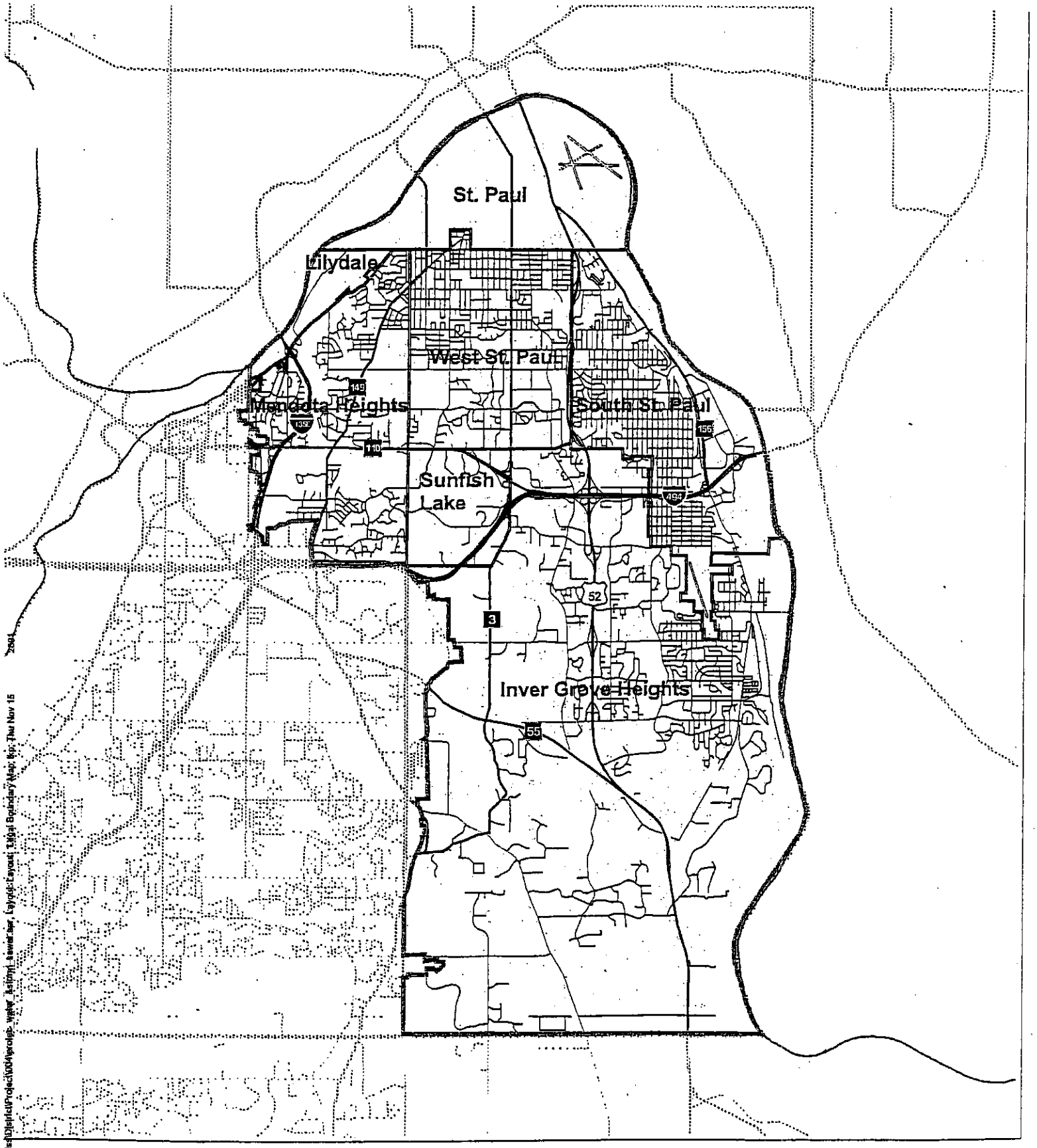
Attest: _____

Approved by the City Council
Nov. 26, 2001.

CITY OF WEST ST. PAUL

BY: _____
Its Mayor

BY: _____
Its City Manager



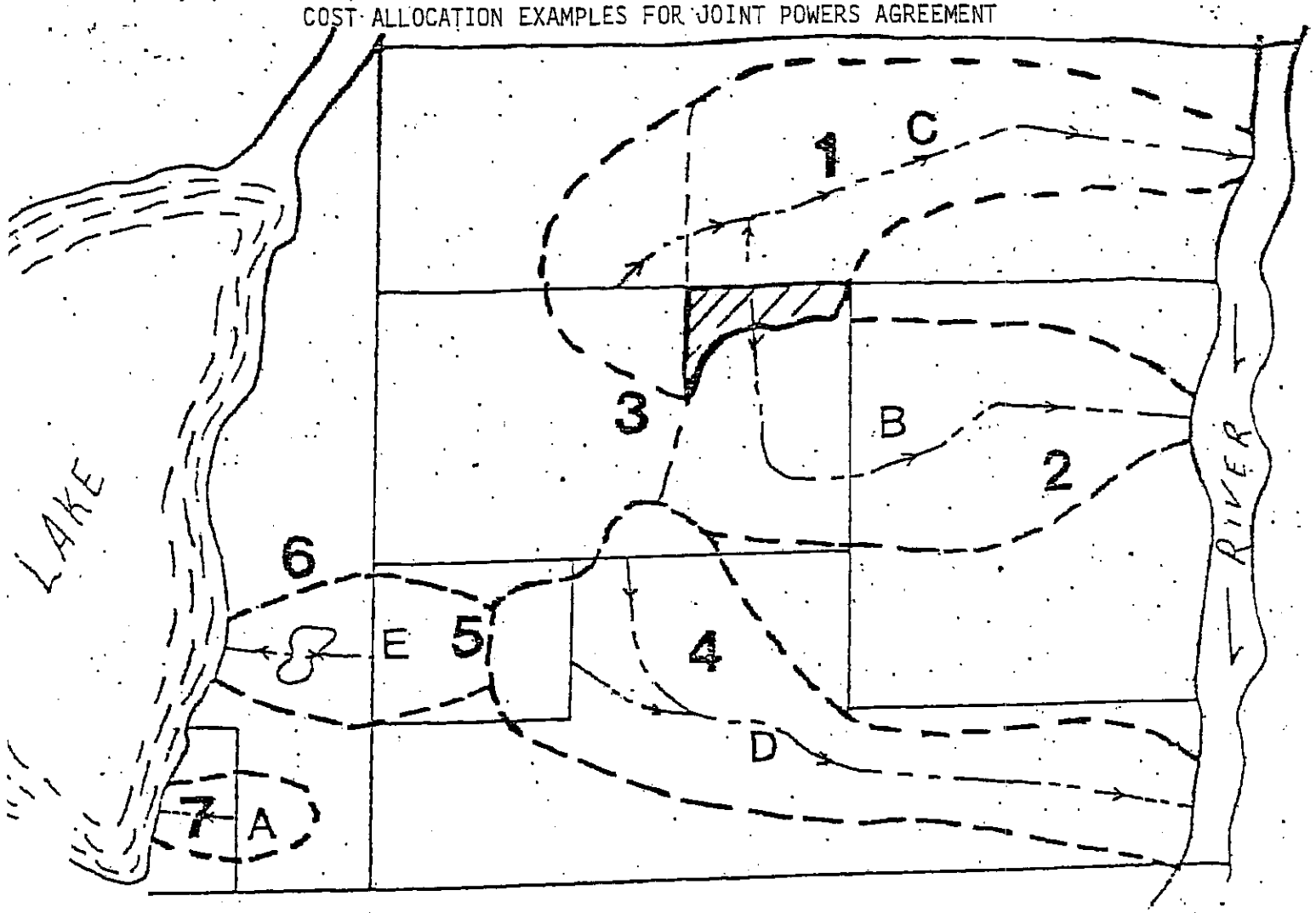
Legal Boundary Map of the
Lower Mississippi River
Watershed Management Organization

Exhibit A

1 0 1 Miles

N

COST ALLOCATION EXAMPLES FOR JOINT POWERS AGREEMENT



EXAMPLE	DESCRIPTION
A.	Two Cities
B.	Two Cities With Diversion In
C.	Two Cities With Diversion Out
D.	Three Cities
E.	Added Ponding

LEGEND

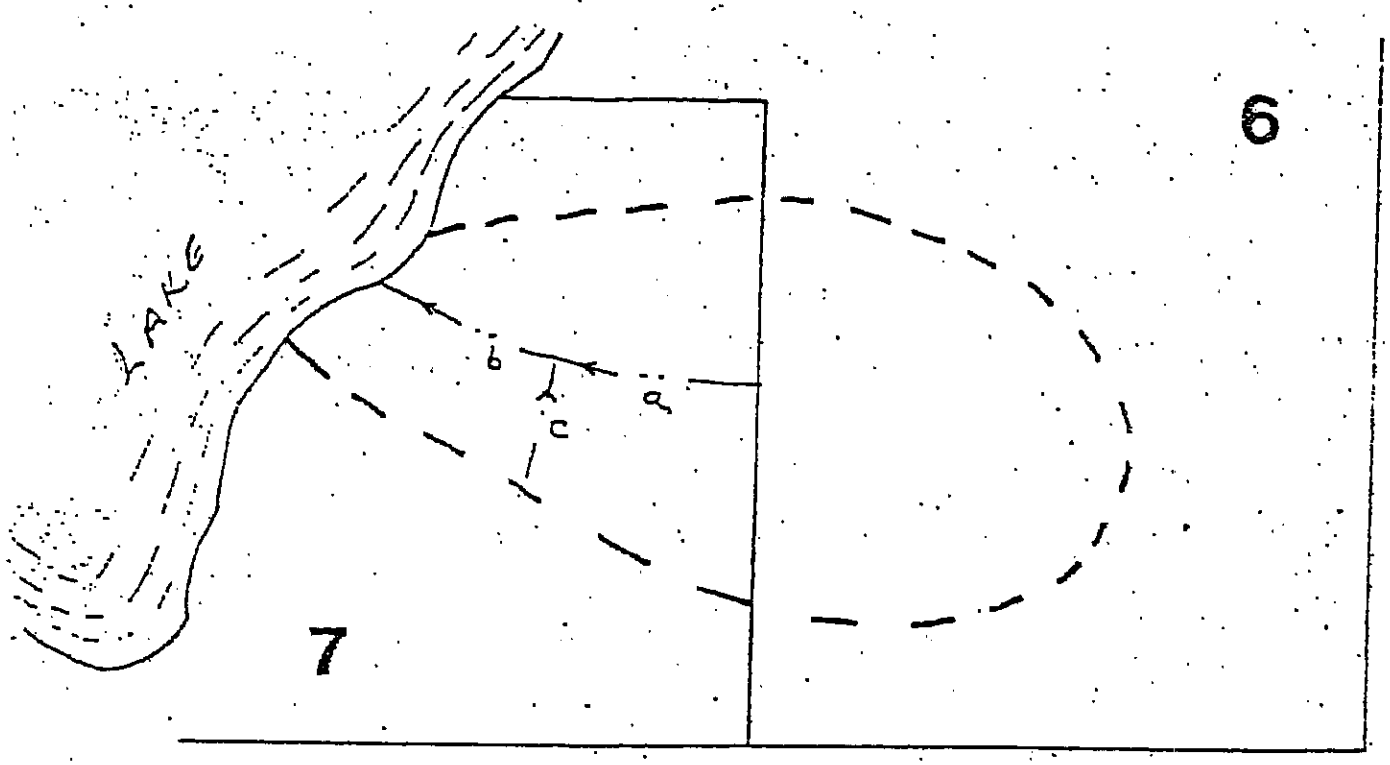
Watershed Boundary

Drainage Facility

City Boundary

Detention Pond

Diverted Area



EXAMPLE "A" - TWO CITIES

Project: Construct project (Segments "a" and "b") in City #7 to provide drainage for Cities #6 and #7 under fully developed conditions.

Cost Allocation:

City #6: Cost share $= \frac{Q_{E6}}{Q_T} \times$ Total project cost for "a".

City #7: Cost share = Total project cost $- \left(\frac{Q_{E6}}{Q_T} \times \text{Total project cost} \right)$

Where: $Q_{E6} = Q_{T6} - Q_{A6}$;

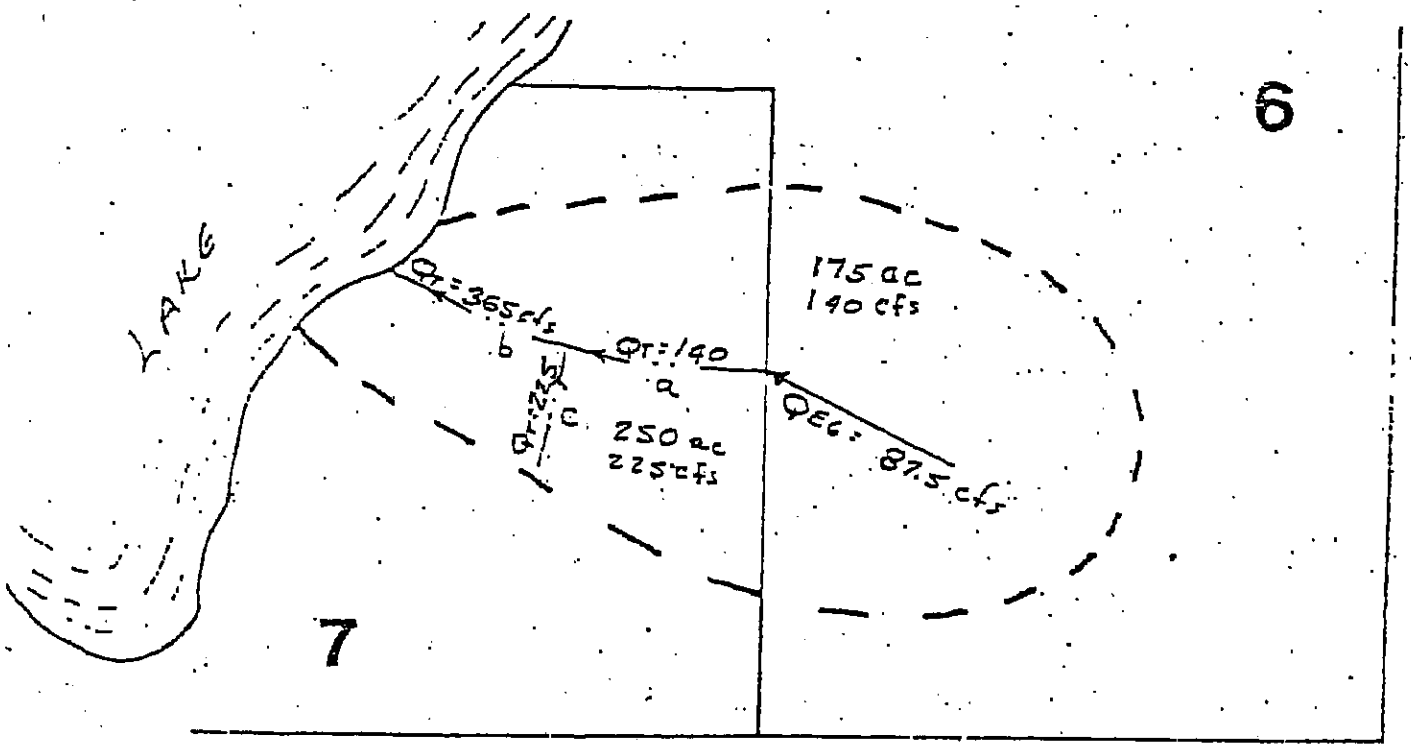
Q_{E6} is the design flow rate from City #6 which is in excess of the allowable flow rate from City #6;

Q_{A6} is the allowable flow rate from City #6;

Q_{T6} is the total design flow rate from City #6;

Q_T is the total flow rate for which the project is designed in each Segment.

City #6: Cost share for Segment "c" = Zero dollar (no tributary flow).



EXAMPLE "A" - TWO CITIES

Sample Calculations

sume:

City #6 - Area of Watershed within City #6 = 175 acres
Full development runoff (Q_{T6}) = CIA = 0.40 x 2.0"/h x 175 = 140 cfs
Predevelopment runoff (Q_{A6}) = CIA = 0.15 x 2.0"/h x 175 = 52.5 cfs

Then:

Excess runoff (Q_{E6}) (from formulae: $Q_E = Q_T - Q_A$) = 87.5 cfs

1. City #6 cost share for Segment "a" = $\frac{87.5}{140}$ x project cost for "a" = .63 x Project cost for "a".

(From formulae: share = $\frac{Q_E}{Q_T}$ x Project cost)

Note: Segment "a" ends at first point of entry into the system from City #7.

Assume:

City #7 - Area of Watershed within City #7 = 250 acres and all flows from City #7 enter system by way of Segment "c".
Full development runoff (Q_{T7}) = CIA = .50x1.8x250 = 225 cfs
Design flow for Segment "b" = $Q_{T(SEG.\ "a")} + Q_{T7}$ = 140 + 225 = 365 cfs

City #6 has no cost share obligation in Segment "c" when there is no tributary flow from City #6.

(continued)

Then:

3. City #6 cost share for Segment "b" = $\frac{87.5}{365}$ x Project cost for "b" = 0.24 Project cost of "b".

(From formulae: Share = $\frac{Q_{E6}}{Q_T}$ x Project cost)

Note:

City #6 can reduce the excess flow (Q_{E6}) by detention ponding even to the amount that the rate of flow from City #6 (Q_{T6}) is no greater than the allowable flow rate (Q_{A6}). Any reduction in the total rate from City #6 would be applied to the excess rate and thereby reduce the obligation of City #6 to share in the cost of constructing any conveyance system in City #7.

SUMMARY OF COSTS

Segment "a":

City #6: Cost share = $\frac{87.5}{140}$ x Project cost for "a".

City #7: Cost share = $\frac{52.5}{140}$ x Project cost for "a".

Segment "b":

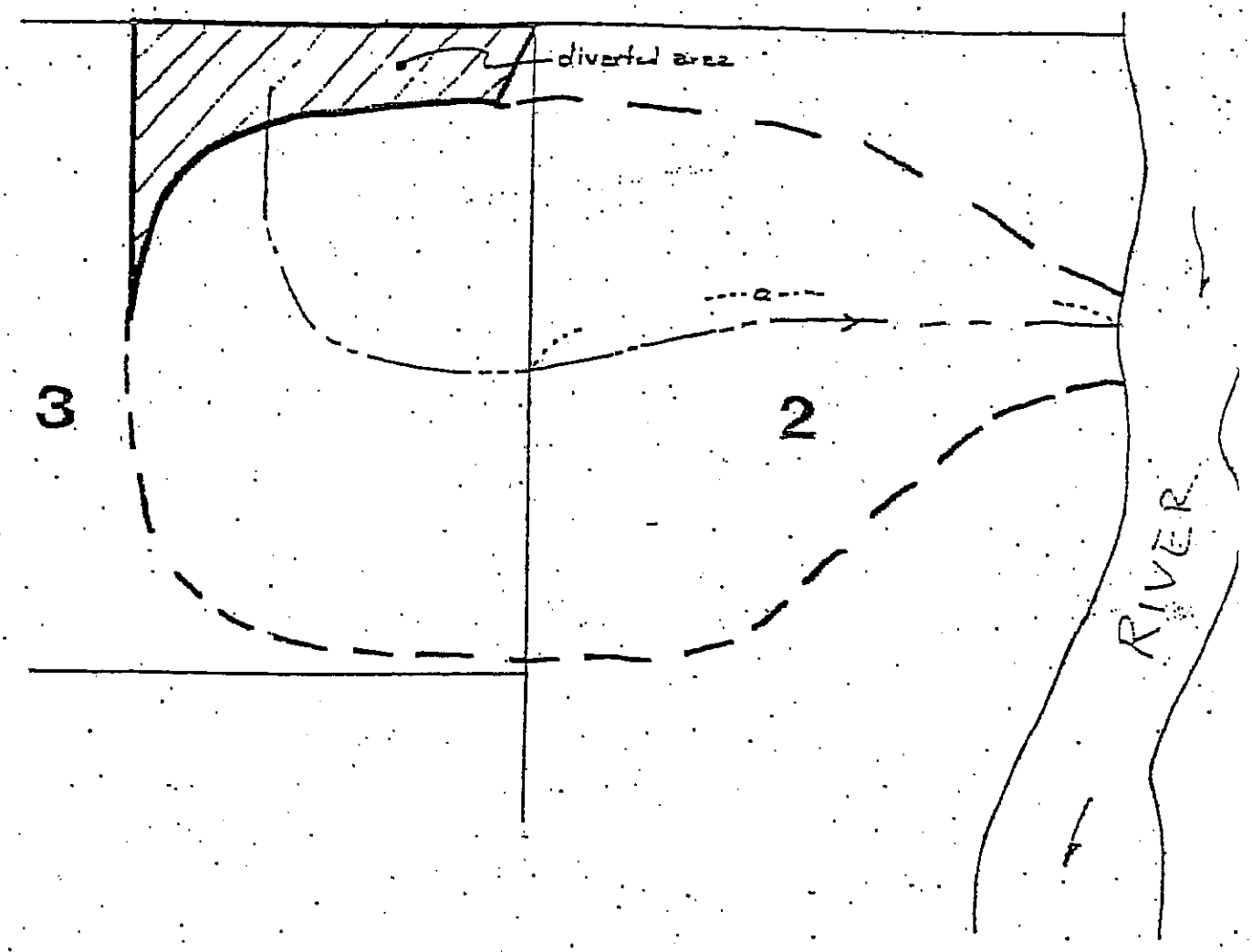
City #6: Cost share = $\frac{87.5}{365}$ x Project cost for "b".

City #7: Cost share = $\frac{277.5}{365}$ x Project cost for "b".

Segment "c":

City #6: Cost share = Zero dollar (no tributary flow).

City #7: Cost share = All of Project cost for "c".



EXAMPLE "B" - TWO CITIES WITH DIVERSION IN

Project: Construct Trunk facility "a" in City #2 only for Cities #2 and #3 under fully developed conditions.

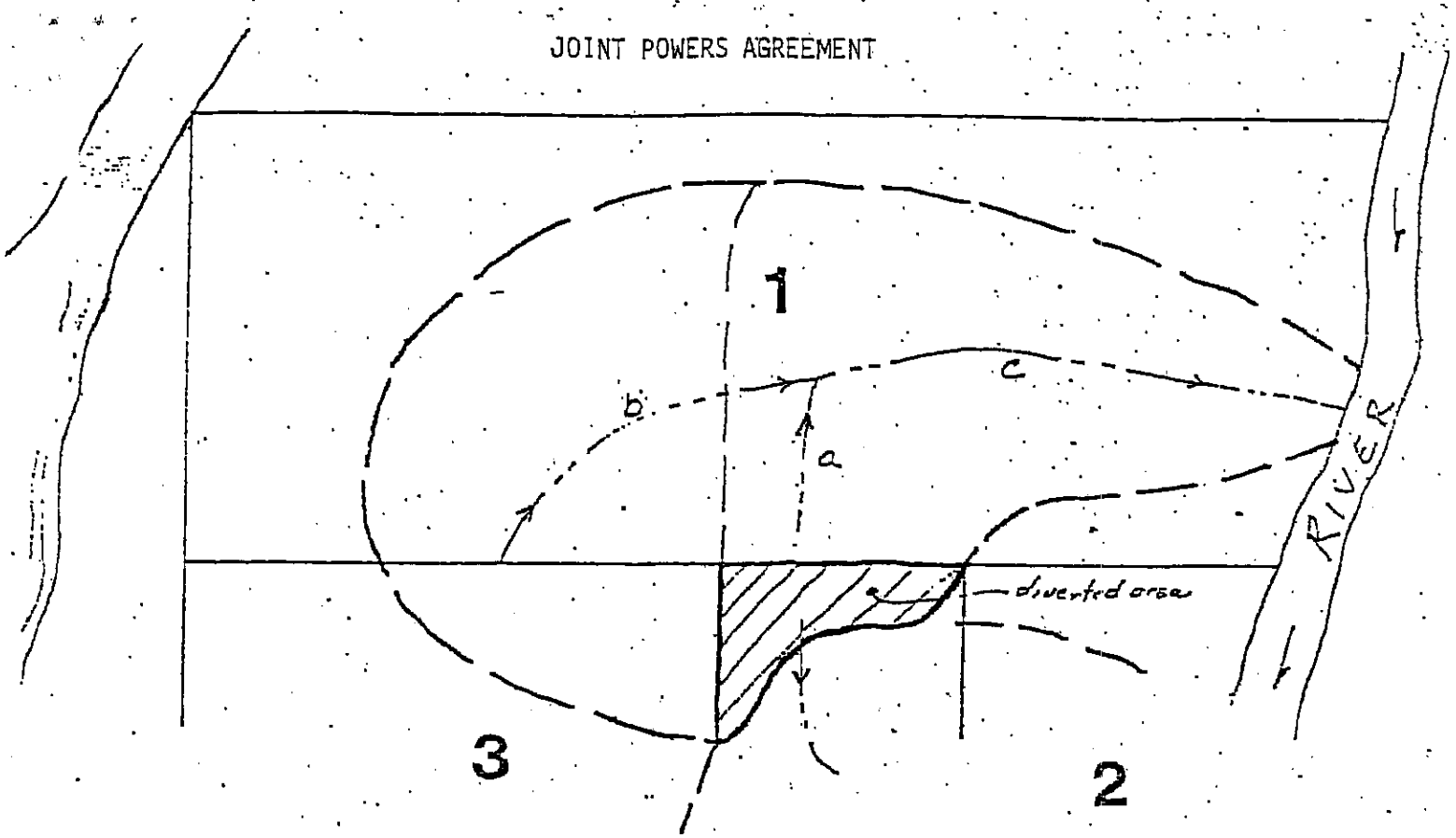
Cost Allocation:

City #3: Cost share $= \frac{Q_{E3}}{Q_T} \times$ Total project cost.

Where: $Q_{E3} = Q_{T3} - Q_{A3}$
And Q_{E3} is the design flow from City #3 as described in Example "A" plus all flows coming from the area diverted. All facilities within City #3 are constructed by City #3. Detention in City #3 can reduce Q_{E3};

Q_T and Q_A are as defined in Example "A".

e: This case applies only where waters are diverted from one City to another City or from one major drainage district to another.



EXAMPLE "C" - TWO CITIES WITH DIVERSION OUT

Project: Construct Trunk Segments "a", "b", "c" in City #1 under fully developed conditions.

Cost Allocation:

City #3: Cost share for Segment "a" = Zero dollars (all flows have been diverted away)

Cost share for Segment "b" $= \frac{Q_{E3}}{Q_T}$ x Total project cost for "b".

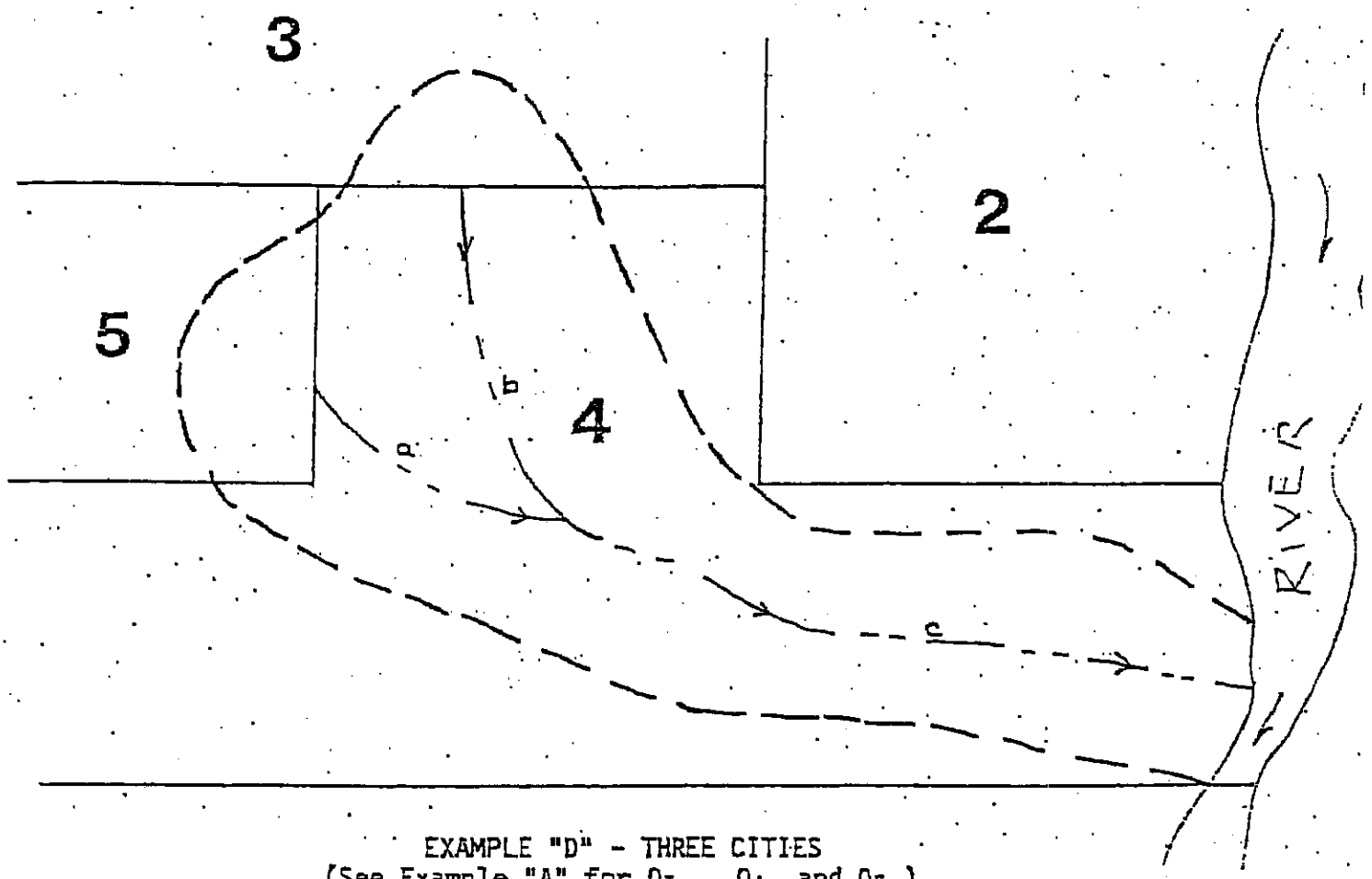
Where: Q_{E3} is the excess flow from City #3 that is tributary to Segment "b" only.

City #3: Cost share for Segment "c" $= \frac{Q_{E3}}{Q_T}$ x Total project cost for "c".

Where: Q_{E3} is the excess flow from City #3 that is tributary to Segment "c" calculated as Q_{E3} tributary to "b" minus Q_{A3} that would have been tributary to "a" had there been no diversion out of the drainage district.

Q_T and Q_A are as defined in Example "A".

Note: This case applies only where waters are diverted from one City to another City. or from one major drainage district to another.



EXAMPLE "D" - THREE CITIES
(See Example "A" for Q_T, Q_A and Q_E)

Project: Construct Project (Segments "a", "b" and "c") in City #4 to provide drainage for Cities #3, #4, and #5 under fully developed conditions.

Cost Allocations:

City #3: Cost share Segment "b" = $\frac{Q_{E3}}{Q_T}$ x Project cost for "b".

Cost share Segment "a" = Zero dollars (no tributary flow).

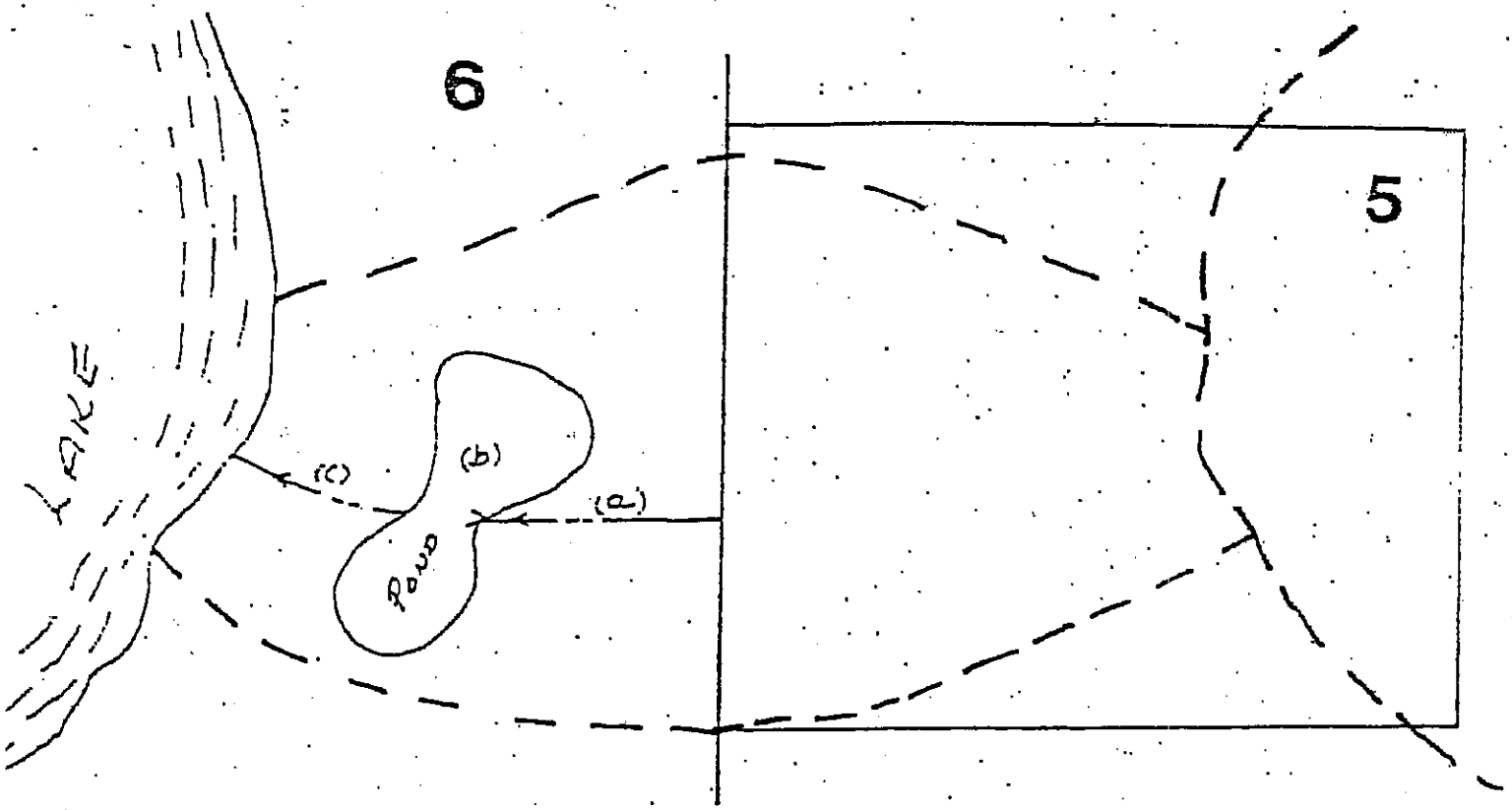
Cost share Segment "c" = $\frac{Q_{E3}}{Q_T}$ x Project cost for "c".

City #5 Cost share Segment "a" = $\frac{Q_{E5}}{Q_T}$ x Project cost for "a".

Cost share Segment "b" = Zero Dollars (no tributary flow).

Cost share Segment "c" = $\frac{Q_{E5}}{Q_T}$ x Project cost for "c".

Where: Q_T is the total flow rate for which each respective Segment is designed.



EXAMPLE "E" - ADDED PONDING
(See Example "A" for definition of Q_T , Q_A and Q_E)

ct: Construct Trunk "a", Detention Pond "b" and Outlet "c" for cities #5 and #6 under fully developed conditions.

Cost Allocation:

City #5 (Trunk "a"): Cost share $= \frac{Q_{E5}}{Q_T}$ x Project cost of Trunk "a".

Where: Q is the total flow rate in Trunk "a".

City #5 (Pond "b"): Cost share $= \frac{V_{E5}}{V_T}$ x Project cost of Pond "b".

Where: V_{E5} is the design Volume of runoff from City #5 which is in excess of the allowable Volume from City #5;

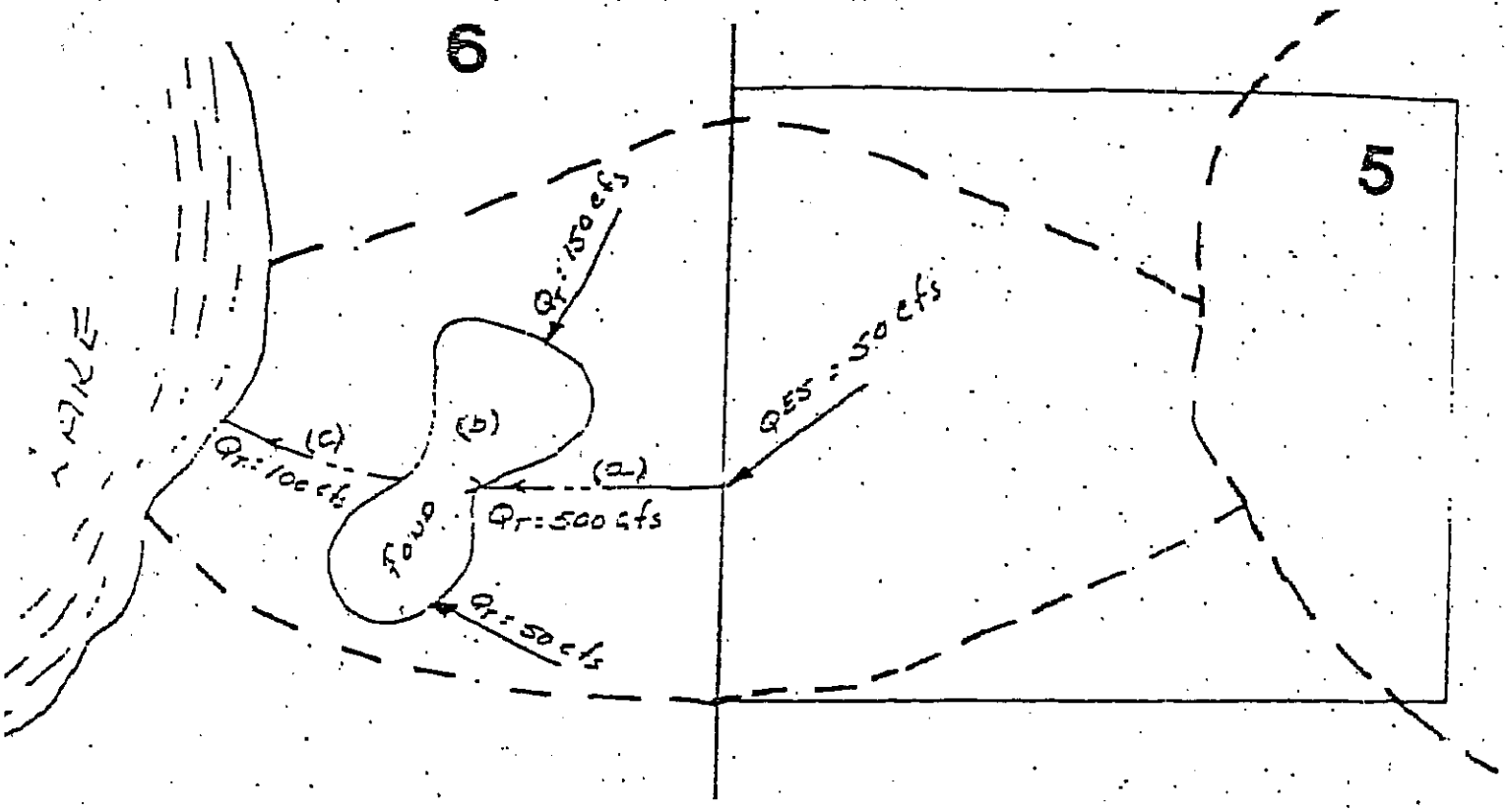
V_T is the total Volume used in the design of the detention pond.

City #5 (Outlet "c"): Cost share $= \frac{Q_{E5}}{Q_T}$ x Project cost of Outlet "c".

Where: Q_{E5} is reduced from Trunk "a" Inlet Q_{E5} by the ratio of $\frac{\text{Outlet } Q_T}{\text{Inlet } Q_T}$;

Inlet Q_T is the summation of all flows into the pond;
Outlet Q_T is the total flow rate out of the pond under design conditions.

:e: See Page 9 for sample calculations



EXAMPLE "E" - ADDED PONDING

ample calculation for City #5 cost share for Outlet "c":

Assume:

Q_{E5} = 50 cfs

Q_T Pond inflow in Segment "a" = 500 cfs

Q_T Pond inflow from other areas = 200 cfs

ΣQ_T Pond inflow = 700 cfs

Q_T Pond Outlet "c" = 100 cfs

And:

$$Q_{E5\ (OUTLET)} = Q_{E5\ (INLET)} \times \frac{Q_{T\ (OUTLET)}}{\Sigma Q_{T\ (INLET)}}$$

$$\text{City \#5 cost share} = \frac{Q_{E5\ (OUTLET)}}{Q_{T\ (OUTLET)}} \times \text{Project cost of Outlet "c"}$$

Then:

$$Q_{E5}\ \text{(for Segment "c")} = \frac{100}{700} \times 50 = 7.14\ \text{cfs}$$

$$\text{City \#5 cost share} = \frac{7.14}{100} \times \text{Project cost of Outlet "c"}$$

Joint and Cooperative Agreement for the Mississippi Watershed Management Organization

City of Minneapolis
❖
City of St. Paul
❖
City of St. Anthony
❖
City of Lauderdale
❖
Minneapolis Park and Recreation Board

January 2002

Table of Contents

		Page
Membership		1
Article I	Legal Purpose	2
Article II	Definitions	3
Article III	Board of Commissioners	5
Article IV	Powers and Duties of the Board of Commissioners	7
Article V	Operating Budget	10
Article VI	Capital Budget	12
Article VII	Duration	15
Article VIII	Dissolution	16
Article IX	Amendments	17
Article X	Effective Date	18
Member Authorization		19
Legal Description		Appendix A
Watershed Boundaries		Appendix B

Membership

This Agreement entered into as of the date of execution by and among the following:

Cities of

Lauderdale
Minneapolis
St. Anthony
Saint Paul

and the Minneapolis Park and Recreation Board for the establishment of a Watershed Management Organization. The aforementioned cities and the Minneapolis Park and Recreation Board shall hereinafter be referred to as Members.

WHEREAS, the Members have authority pursuant to Minnesota Statutes, Section 471.59 to jointly and cooperatively by agreement exercise powers common to the contracting bodies pursuant to Minnesota Statutes, Section 103B.201 to 103B.251 and

WHEREAS, the Members desire to plan a comprehensive water management program in accordance with Minnesota Statutes, Sections 103B.201 to 103B.251;

NOW THEREFORE, the parties to this Agreement do mutually agree as follows:

Article I

Legal Purpose

The purpose of this Joint and Cooperative Agreement for the Mississippi Watershed Management Organization is to replace the Joint Powers Agreement for the Middle Mississippi River Watershed Management Organization executed in 1985 and the Joint and Cooperative Agreement for the Middle Mississippi River Watershed Management Organization of January 1997.

The purpose of the Mississippi Watershed Management Organization, as provided for in this Agreement, is to provide for the wise, long-term management of water and associated land resources within the watershed through implementation measures that realize multiple objectives, respect ecosystem principles, and cultural and historical community values. The Mississippi Watershed Management Organization seeks to: (a) protect, enhance, and restore the quality and quantity of surface and ground water resources within the Mississippi Watershed Management Organization jurisdiction; (b) protect, preserve, and use natural surface and ground water storage and retention systems; (c) efficiently utilize public capital expenditures needed to correct and control flooding and water quality problems; (d) identify and plan for means to use protect and improve surface and ground water quality; (e) establish more uniform local policies and official controls for surface and ground water management; (f) promote ground water recharge; (g) protect and enhance fish and wildlife habitat and water recreation facilities; (h) secure the other benefits associated with the proper management of surface and ground water; and (i) promote and encourage cooperation among Members and among other organizations in coordinating local comprehensive water management programs.

A legal description and map of the boundaries of the Mississippi Watershed Management Organization are included pursuant to Minnesota Rules 84010.0030, Subpart 1.B in Appendix A and B respectively of this Agreement.

Article II

Definitions

For the purpose of this Agreement, the terms used herein shall have the meanings defined in this article.

Subdivision 1: "Organization" is the Mississippi Watershed Management Organization.

Subdivision 2: "Commission" shall mean the governing body of the Organization and shall consist of a Commissioner or Alternate from each of its Members.

Subdivision 3: "Commissioner" shall mean any person appointed to the Commission by each Members governing body, or in the Commissioner's absence, the Alternate.

Subdivision 4: "Alternate" shall mean any person appointed to the Commission by each Member's governing body to represent the Member in the absence of the Commissioner.

Subdivision 5: "Council" shall mean the governing body of a Member. In the case of municipalities, this shall be the elected officials responsible for governing the city and for Minneapolis Park & Recreation Board, its Board of Commissioners.

Subdivision 6: "Member" or 'Member Community' shall mean any city, county, or special purpose government entity within the watershed that enters into this Agreement.

Subdivision 7: "Agreement" shall mean the "Joint and Cooperative Agreement adopted by the member councils creating and the establishing the Mississippi Watershed Management Organization.

Subdivision 8: "Plan" shall mean the Watershed Management Plan adopted by the Mississippi Watershed Management Organization.

Subdivision 9: "Watershed" means the area contained within a line drawn around the extremities of all terrain whose surface drainage is tributary to the Mississippi River and within the mapped areas reasonably demonstrated on the map identified as Appendix B, as defined within the legal description identified in Appendix A.

Subdivision 10: "Act" is defined as the Metropolitan Surface Water Management Act as found in Minnesota Statutes, Sections 103B.201 to 103B.251.

Subdivision 11: "Operating Budget" refers to the administrative expenses incurred by the Organization.

Subdivision 12: "Capital Improvement Project" shall mean a physical improvement project other than routine maintenance within the Watershed Management Organization boundaries.

Subdivision 13: "Majority" shall be defined as greater than half of the quorum.

Subdivision 14: "Subwatershed" a smaller geographic section of a larger watershed unit with a drainage area whose boundaries include all the land area draining to a point.

Subdivision 15: "Year" shall mean from January 1 to December 31.

Subdivision 16: "Quorum" shall mean the number of Commissioners or Alternates required to be present for business to be legally transacted. This number shall be any number which is greater than half of the Members. Any number less than a quorum may adjourn a scheduled meeting.

Article III

Board of Commissioners

Subdivision 1: The governing body of the Organization shall be its Commission which shall consist of five (5) voting Commissioners. Each Commissioner shall have one vote. All appointments to the Commission shall be in accordance with Minnesota Statutes 103B.227. The Board of Water and Soil Resources shall be notified of all appointments and vacancies of the Commission within 30 days. All vacancies shall be filled within ninety (90) days after they occur. Notices of all vacancies and appointments shall be published in a legal publication of the Members community appointing the Commissioner at least fifteen (15) days prior to the appointment. Vacancies shall be filled for the remainder of the term by the Council who appointed or had the right to appoint the Commissioner. The Council of each Member shall appoint one (1) Commissioner to represent the Member to the Commission. Each Commissioner shall serve until his or her successor is appointed.

Subdivision 2: A Commissioner may not be removed from the Commission except for just cause by the Council that made the appointment.

Subdivision 3: Member Councils may select and appoint alternates to the Commission in the same manner as Commissioners. In the absence of a Member's Commissioner, the designated Alternate may vote and act in the Commissioner's place. The Alternate shall serve a term concurrent with the Member's Commissioner.

Subdivision 4: Each Member's Council shall, within thirty (30) days of appointment, file with the Secretary of the Commission a record of the appointment of its Commissioner and Alternate. The Commission shall notify the Board of Water and Soil Resources of Member appointments and vacancies within thirty (30) days after receiving notice from the Member.

Subdivision 5: The Council of each Member shall determine the eligibility and qualifications of its Commissioner and Alternate. However, the terms of each Commissioner shall be as established by this Agreement.

Subdivision 6: Regular meetings shall be held by the Commission periodically at the time and place determined by the Commission pursuant to open meeting law, Minnesota State Statutes 471.705.

Subdivision 7: At the first meeting of the Commission each year and each calendar year thereafter, staff will confer with Commissioners and recommend officers for the various positions on the Commission. At the first meeting of the Commission and each calendar year thereafter, the Commission shall elect from its Members a chairperson, a vice chairperson, a treasurer, a secretary, and such other officers as it deems necessary to conduct its meetings and affairs.

Subdivision 8: The Commission shall adopt those bylaws and procedures necessary for the conduct of its meetings. Such rules may be amended at either a regular or special meeting of the Commission provided that a ten (10) day prior notice of the proposed amendment has been furnished to each Commissioner and Alternate to whom notice of meetings is required to be sent.

Subdivision 9: The Commission may create such committees, task forces or working groups as needed to accomplish its mission.

Subdivision 10: Commissioners shall serve without compensation from the Organization, but this shall not prevent a Member's Council from providing compensation for its Commissioner for serving on the Commission, if such compensation is authorized by such governmental unit and by law.

Article IV

Powers and Duties of the Board of Commissioners

Subdivision 1: The Commission shall employ such persons, as it deems necessary to accomplish its duties and powers. The Commission may hire staff on a full time, part time or consulting basis. The Commission may also incur expenses and expenditures necessary and incidental to the effectuation and/or implementation of its purposes and powers.

Subdivision 2: In order for the Commission to conduct business, a quorum must be present. Decisions by the Commission require a majority vote of the quorum present.

Subdivision 3: The Commission shall have an established Citizen Advisory Committee and Technical Advisory Committee to provide input and to serve in an advisory role.

Subdivision 4: The Commission shall review and approve a Local Water Management Plan for each of its Member Communities as established under Minnesota Statutes, Chapter 103B. Approval of the plan shall require no more than a majority vote.

Subdivision 5: The Commission may acquire, operate, construct, and maintain capital improvement projects delineated in the Watershed Management Organization Watershed Management Plan for the protection, enhancement, and improvement of the watershed.

Subdivision 6: The Commission shall make a reasonable attempt to assess the compatibility of proposed capital improvement projects with other existing policies, programs, and projects within the MWMO and across its boundaries. In particular, compatibility with neighborhood association and community council plans in the project area should be considered. An informal review should occur at least two months before the capital improvement project proposal is approved in the MWMO budget.

Subdivision 7: The Commission shall develop a comprehensive Watershed Management Organization Watershed Management Plan to meet the requirements of Minnesota Statutes, Chapter 103B. The plan shall establish comprehensive goals and policies for the protection, enhancement, and improvement of the watershed, and shall establish specific implementation strategies to realize these goals and policies.

Subdivision 8: The Commission shall have the power to contract with any governmental unit, private or nonprofit association to accomplish the purposes for which it is organized.

Subdivision 9: The Commission has the authority to apply for, accept, and use grants, loans, money or other property from the United States, the State of Minnesota, a unit of government or any person or entity for the Organization. The Organization may use and dispose of such money or property for any expenses/fees, policies, goals, capital improvement projects, or any use the Organization deems necessary to pursue its goals and policies.

Subdivision 10: The Commission may establish and maintain devices for acquiring and recording hydrologic and water quality data within the watershed.

Subdivision 11: The Commission may contract for, or purchase such insurance, as they deem necessary for the protection of the Commission.

Subdivision 12: The Commission shall have the authority to invite governmental entities within the area of the watershed to join the Organization. Furthermore, any governmental entities within the area of the watershed may petition for membership in the Organization. The addition of new Members shall require a majority vote of the Commission and appropriate resolution by current Member Councils. The effective date shall be the date of filing by the last Council resolution approving the addition. As Members are added to the Organization, there shall be created one voting Commissioner. Furthermore, as each new Member is added, the cost shares of the operating budget (Article V, Subdivision 3) will be reassessed.

Subdivision 13: The Commission has the authority to contract for the space, equipment, and supplies to carry on its activities either with an individual Member or elsewhere.

Subdivision 14: The Commission may investigate on its own initiative or upon petition of any Member, complaints relating to the pollution of surface or ground water in the watershed. Upon a finding that the watershed is being polluted, the Commission may take appropriate action to alleviate the pollution including recommending enforcement and other regulatory actions to the appropriate jurisdiction.

Subdivision 15: Commissioners and staff may enter upon lands within or without the watershed to make surveys and investigations to accomplish the purposes, goals and policies of the Organization. Such entrance shall occur after obtaining a duly executed search warrant, with permission of the property owner, or when a search warrant for access to the property is not required. The Commission shall be liable for actual damages resulting therefrom, subject to the limitations of Minnesota Statues Section 466.01, et. seq. Every person who claims damages shall serve the Chair or Secretary of the Commission with a notice of claim as required by Minnesota Statutes, Chapter 466.05.

Subdivision 16: The Commission may vote to provide legal and technical assistance in connection with litigation or other proceedings between one or more of its Members and any other political subdivision, commission, board or agency relating to the planning or construction of capital improvement projects approved by the Organization.

Subdivision 17: The Commission shall at least every 2 years solicit interest proposals for professional or technical consultant services before retaining the services of a consultant or extending annual service agreements.

Subdivision 18: The Commission may designate one or more national or state bank or trust companies authorized by Chapters 118 or 427 of Minnesota Statutes to receive deposits of public moneys to act as depositories for the Organization's funds. No funds may be disbursed without the signature of the Chair and the Treasurer. The Treasurer shall be required to file with the Secretary of the Commission a bond in the sum of at least $10,000 or such higher amount as shall be determined by the Commission. The Commission shall pay the premium on said bond.

Subdivision 19: The Commission may exercise all other powers necessary and incidental to the implementation of the purposes and powers set forth herein.

Article V

Operating Budget

Subdivision 1: The Commission shall adopt an operating budget for the ensuing year on or before September 1 of each year. The budget shall then be certified by the Secretary of the Commission on or before October 1 to the clerk of each Members Council together with a statement of the proportion of the budget to be provided by each Member. The Council of each Member agrees to review the budget. The Commission shall upon notice from any Member received prior to November 1, hear objections to the budget. Such notice shall be written to the Commission's Secretary and delivered by certified mail to their principal business address. The Commission, upon notice delivered by US Mail to all Members and after a hearing, may modify or amend the budget. If no objections are submitted to the Commission, each Member agrees to provide the funds required by the budget on or before February 1. Modifications or amendments to the original budget require a majority vote. The operating budget shall not exceed $20,000 annually.

Subdivision 2: The Commission has the duty to make a full and complete financial accounting report to each Member at least once annually. A certified public accountant shall perform the audit of the Organization. The report shall include the approved budget; a reporting of revenues; a reporting of expenditures; a financial audit report or section that includes a balance sheet; a classification of revenues and expenditures; an analysis of changes in final balances; and any additional statements considered necessary for full financial disclosure; and the status of all Commission projects and work within the watershed; copies of said report shall be transmitted to the clerk, or appropriate staff member of each Member's Council.

Subdivision 3: Member contributions to the operating budget will be determined on a percentage basis of the geographic area of each Member's properties and jurisdictional boundaries within the watershed, excluding properties owned by the Minneapolis Park and Recreation Board. The Minneapolis Park and Recreation Board share shall be determined by that portion of property owned by them. This assessment shall be allocated as follows:

Member	Share
Minneapolis	94.3%
St. Anthony	3.3%
Saint Paul	1.4%
Minneapolis Park and Recreation Board	0.6%
Lauderdale	0.4%

Subdivision 4: Projects or other necessary expenditures which cannot be accomplished through the capital budget and would exceed the cost of the operating budget of Article V, Subdivision 1, shall be addressed by mutual agreement of the affected Members outside of this Agreement.

Article VI

Capital Budget

Subdivision 1: The Members recognize that on-going capital expenditures will be required to solve some of the water resource problems within the watershed. For the purposes of this Agreement, capital improvement projects are those determined necessary to implement the Organization's Capital Improvement Program.

Subdivision 2: Capital Projects will be financed over the entire watershed.

Subdivision 3: In order to finance an approved capital improvement project, the Commission may levy an ad valorem tax against the entire watershed.

Subdivision 4: Approval of capital improvement projects shall require a majority vote of the quorum present and other such bodies as required by law. Capital improvement projects shall be financed in accordance with Minnesota Statutes, 103B and 103D.

Subdivision 5: The Commission shall have the authority to prepare and adopt a Capital Improvement Program as defined in Minnesota Statutes 103B.205 Subdivision 3 as part of the Watershed Management Plan. The Capital Improvement Program shall set forth the schedule of capital projects identified in the Watershed Management Plan as well as designating Members for participation in each project and estimating the total costs for such projects. Projects not identified in the Watershed Management Organization Watershed Management Plan shall not be included in the Capital Improvement Program until and unless the Watershed Management Organization Watershed Management Plan is amended to include such projects. Implementation of the Capital Improvement Program will begin upon adoption of the Watershed Management Organization Watershed Management Plan subject to the availability of funding.

Subdivision 6: All capital improvement projects need to be listed in the Watershed Management Plan.

Subdivision 7: All capital improvement project proposals for the following year must be submitted to staff before May 1 so that the proposed capital budget can be submitted to the Commissioners during the May

Commission meeting. All WMO capital improvement project proposals for subsequent fiscal year(s) must be submitted to WMO staff before May 1st of the extant budget year. By the August Commission meeting within this extant budget year, presentation of this proposed capital budget will be submitted to the Commissioners.

Subdivision 8: Funding for any and all capital improvement projects may only occur if the project(s) is in the approved capital budget.

Subdivision 9: Beginning with the year the Watershed Management Plan is adopted, the Commission shall submit, by June 1, a draft capital budget to the clerk of Member's Council for their review. The Council of each Member may review and comment on the budget. The Commission shall upon notice from any Member received prior to August 1, hear objections to the budget. Such notice shall be written to the Commission's Secretary and delivered by certified mail to their principal business address. The Commission, upon notice delivered by US Mail to all Members and after a hearing, may modify or amend the budget. The MMRWMO Commission shall hold a public hearing in accordance with Minnesota Statutes 103B and 103D on the proposed capital budget. On or before September 15 of each year, the Commissioners shall adopt a capital budget for the next year and decide on the total amount to be raised from ad valorem tax levies. By the September 15 of each year the budget shall be certified by the Secretary of the Commission to the County, Counties or the clerk or appropriate staff member of each Member's Council together with a statement of the proportion of the budget to be provided.

Subdivision 10: If the Organization is responsible for the planning, design, acquisition, relocation, or construction of an approved capital project on behalf of a Member, each Member having a financial obligation therefore, shall also provide to the Organization the funds required by the budget from that member on or before February 1.

If the Member is responsible for the completion of the capital project, the Organization's approved share of the project cost coming from its tax levy will be reimbursed to the member from actual tax revenues received in a manner agreed to. The Member being reimbursed for project costs by the Organization shall agree to be responsible for providing any requested documentation of costs requested by the Organization or its auditors.

Subdivision 11: Projects will be funded in the watershed on the basis of potential merit to all the Members and according to the criteria established in the MWMO Watershed Management Plan. Annually a review

shall take place showing how much each Member has contributed to the watershed levy and how much each Member has benefited from projects undertaken in their jurisdiction. Funds generated through the annual levy in the cities of St. Anthony, St. Paul, and Lauderdale, will be made available to that member community if capital improvement projects have been designated in the MWMO Watershed Management Plan and approved in the MWMO capital budget.

Subdivision 12: If a member has a capital improvement project designated for a future year, all generated funds collected as part of an approved capital budget for said project may be held in an account and designated for the project per MN Statute 103B.241 Subd. 1.

Subdivision 13: If a member has no designated capital improvement projects, all generated funds will be placed in a general account for use by those members with designated capital improvement projects.

Article VII

Duration

Each Member agrees to be bound by the terms of this Agreement until January 1, 2010, and it may be continued thereafter upon the agreement of all Members.

Article VIII

Dissolution

Any Member may petition the Commission to dissolve the Organization. Upon thirty days advance written notice to each Member, the Commission shall hold a hearing to consider dissolution of the Organization. If a majority of the Commission votes in favor of dissolution, the Commission shall submit a resolution for dissolution of the Organization for consideration by each Member's Council, the board of each affected County and the Minnesota Board of Water and Soil Resources. Each governmental unit shall have 90 days in which to consider dissolution of the Organization. If, within 90 days of the date the notice was given, a majority of Members' Councils has ratified said resolution; then the Organization shall be dissolved and this Agreement shall be terminated.

Upon dissolution, the Organization shall complete all work in progress and dispose of all personal property. All property of the Organization shall be sold and the proceeds thereof, together with moneys on hand, shall be distributed to the eligible Members of the Commission as follows: assets derived from contributions to the operating budget shall be apportioned and distributed to each Member in the percentage by which the Member contributed to the Organization under the last annual budget; assets derived from the Capital Improvement Budget shall be apportioned and distributed on an asset by asset basis to each Member in the percentage by which the Member contributed to the specific asset.

Article IX

Amendments

Any Member may recommend to the Commission amendments to this Agreement. Upon a majority vote, amendments to this Agreement shall be forwarded by the Commission to its Members' Councils. No amendment shall be effective until the amendment has been ratified by the Council of each Member. The effective date of any amendment shall be the date on which the last Member's Council ratifies the amendment and is filed with the Secretary of the Commission.

Article X

Effective Date

This Agreement shall be adopted upon ratification by the Council of each Member and the execution of the Agreement by each Member. Upon voting to ratify the Agreement, the clerk of the Council of the ratifying Member shall file a certified copy of the resolution of the ratification with the Clerk of the City of Minneapolis. The effective date of the Agreement shall be the later of January 1, 1997; or the date on which the last Member to ratify files its resolution of ratification. Upon adoption of this Agreement, the Minneapolis City Clerk shall supply to each Member and the Board of Water and Soil Resources a copy of the Members' ratification resolutions and a copy of the signed Agreement.

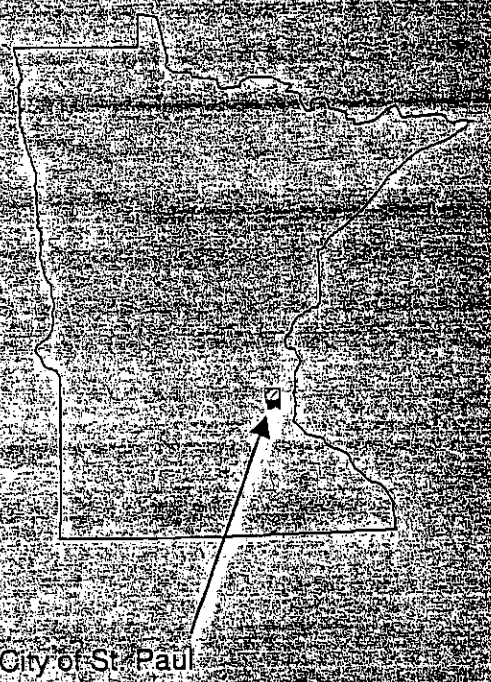
IN WITNESS WHEREOF, the undersigned Members, by action of their Councils, have caused this agreement to be executed in accordance with the authority of Minnesota Statutes Sections 103B.211 and 471.59.

Appendix B

FEMA Flood Insurance Study for the City of St. Paul

FLOOD INSURANCE STUDY

CITY OF ST. PAUL, MINNESOTA
RAMSEY COUNTY



Effective April 2, 2003

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER

275248V000A

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

TABLE OF CONTENTS

1.0 INTRODUCTION 1

1.1 Purpose of Study 1

1.2 Authority and Acknowledgments 1

1.3 Coordination 1

2.0 AREA STUDIED 2

2.1 Scope of Study 2

2.2 Community Description 2

2.3 Principal Flood Problems 2

2.4 Flood Protection Measures 3

3.0 ENGINEERING METHODS 3

3.1 Hydrologic Analyses 3

3.2 Hydraulic Analyses 4

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS 5

4.1 Floodplain Boundaries 5

4.2 Floodways 5

5.0 INSURANCE APPLICATION 8

6.0 FLOOD INSURANCE RATE MAP 8

7.0 OTHER STUDIES 8

8.0 LOCATION OF DATA 9

9.0 BIBLIOGRAPHY AND REFERENCES 9

TABLE OF CONTENTS – Continued

FIGURES

Figure 1 - Floodway Schematic 6

TABLES

Table 1 - Summary of Discharges 4
Table 2 - Floodway Data 7

EXHIBITS

Exhibit 1 - Flood Profiles
Mississippi River — Panels 01P – 07P

Exhibit 2 - Flood Insurance Rate Map Index
Flood Insurance Rate Map
(Published separately)

FLOOD INSURANCE STUDY
CITY OF ST. PAUL, RAMSEY COUNTY, MINNESOTA

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates a previous FIS/Flood Insurance Rate Map (FIRM) for the City of St. Paul, Ramsey County, Minnesota. This information will be used by the City of St. Paul to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP). This information will also be used by local and regional planners to further promote sound land use and floodplain development.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

For the August 3, 1989 FIS, the hydraulic analyses were performed by Toltz, King, Duvall, Anderson and Associates, Incorporated, in consultation with the Minnesota Department of Natural Resources (MNDNR) (Reference 1). The original FIRM was based on a study performed by the MNDNR (Reference 2).

For this FIS, the U.S. Army Corps of Engineers (USACE), St. Paul District, and the MNDNR for the City of St. Paul performed the hydrologic and hydraulic analyses for the Mississippi River.

1.3 Coordination

The results of the study were reviewed at the final Consultation Coordination Officer meeting held on April 16, 2002, and attended by representatives of the Federal Emergency Management Agency (FEMA), the USACE, and the MNDNR. All problems raised at that meeting have been addressed in this study.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographical area of the City of St. Paul, Ramsey County, Minnesota. Flooding caused by overflow of the Mississippi River was studied in detail.

For the original August 3, 1989 FIS, the hydraulic analyses for the Mississippi River between River Mile 833.1 and River Mile 847.7 were revised on the basis of more accurate hydrologic information and an improved hydraulic model. For this revision, hydraulic analyses for the Mississippi River between the corporate limits downstream (River Mile 833.1) and Lock and Dam No. 1 upstream (River Mile 847.8) were revised on the basis of an improved hydraulic model. This revision reflects the modified Wabasha Street Bridge and Smith Avenue High Bridge previously modeled in the August 3, 1989 FIS, and a new bridge, the Raspberry Island Bridge, which was not previously modeled in the August 3, 1989 FIS. The USACE provided certification that the portion of the St. Paul Flood Control Project completed in 1995 and located on the south side of the Mississippi River between River Mile 838 and River Mile 840 would withstand a 0.2-percent-annual-chance flood.

The results of two Letters of Map Revision (LOMRs), 915027 and 951066, were incorporated into the FIS and FIRM. The June 11, 1991 LOMR (915027), and November 9, 1990 LOMR (951066), included new analyses obtained from the St. Paul Flood Control Project along the Mississippi River and revised the flooding in the area of the Metropolitan Wastewater Treatment Plant and Park Entrance.

2.2 Community Description

The City of St. Paul is located in Ramsey County in southeastern Minnesota. Ramsey County is the smallest in land area in Minnesota but the most densely populated. The population of the City of St. Paul is 287,151 according to 2000 census figures (Reference 3).

Based on data for the City of St. Paul, average temperatures range from 2 to 24 degrees Fahrenheit (°F) in winter to 57 to 83°F in summer. Summer thunderstorms are occasionally severe. Winter is a long season, and snow is a distinct possibility anytime between November and April (Reference 4).

2.3 Principal Flood Problems

The Mississippi River is the principal flooding source for the City of St. Paul.

2.4 Flood Protection Measures

There are several levees in the City of St. Paul along the Mississippi River, and all have been certified by the USACE, St. Paul District. No other flood protection measures are known to exist in the City of St. Paul.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the community, standard hydrologic and hydraulic study methods were used to determine the flood-hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent-annual-chance (100-year) flood in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for the flooding source studied by detailed methods affecting the community.

The discharges for the Mississippi River downstream of the Minnesota River were revised by the Upper Mississippi River Basin Commission (Reference 5).

There were no changes to the hydrologic analyses for this revision.

Peak discharge-drainage area relationships for the Mississippi River are shown in Table 1, "Summary of Discharges."

3.2 Hydraulic Analyses

For the original August 3, 1989 FIS, the HEC-2 step-backwater computer program (Reference 6), was used to perform the hydraulic analyses for the Mississippi River. Roughness coefficients (Manning's "n") ranged from 0.02 to 0.04 for the main channel and from 0.04 to 0.125 for the overbank areas. The 1- and 0.2-percent-annual-chance floods were delineated using aerial topographic maps at a scale of 1:12,000 with a contour interval of 2 feet (Reference 1).

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10% ANNUAL CHANCE	2% ANNUAL CHANCE	1% ANNUAL CHANCE	0.2% ANNUAL CHANCE
MISSISSIPPI RIVER					
Downstream of the Minnesota River at St. Paul	36,800	83,000	130,000	150,000	203,000
Upstream of the Minnesota River at St. Paul	19,800	58,000	86,500	100,000	131,000

Since the completion of the St. Paul Flood Control Project in 1995, the following bridges over the Mississippi River have been replaced within the City of St. Paul: Wabasha Street Bridge and Smith Avenue High Bridge. The Raspberry Island Bridge is a new addition to the Mississippi River. Improvements were made to the C&NW Railroad, Holman Airport, and Shephard Road Bridges. Harriet Island and Pickerel Lake were also incorporated into the study.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1) and the FIRM (Exhibit 2).

The starting water surface elevations (WSELs) were taken from a 1979 report from the USACE entitled, *Upper Mississippi River Water-Surface Profiles* (Reference 7).

The Manning's "n" values used are those determined during simultaneous calibration runs on the 1965 and 1969 flood events. The "n" values range from 0.02 to 0.08 for the channel, and from 0.024 to 0.135 for the overbank areas. Contraction coefficients range from 0.1 to 0.6, and expansion coefficients range from 0.3 to 0.8.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 1-percent-annual-chance flood elevations and delineations of the 1- and 0.2-percent-annual-chance floodplain boundaries and 1-percent-annual-chance floodway to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:6,000, with a contour interval of 4 feet.

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, and X), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal-conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (see Table 2, "Floodway Data"). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

The floodway data for the City of St. Paul were developed from existing and base conditions models. Footnotes were added to the Floodway Data Table (Table 2) accordingly. The Regulatory and With Floodway WSELs were obtained from the existing conditions HEC-2 model developed during this study. The Without Floodway WSELs were obtained from the base conditions HEC-2 model. The base conditions HEC-2 model was obtained from the HEC-2 model developed during the first detailed study by revising the reach lengths at selected locations between 2,100 feet downstream and 14,300 feet upstream of the downstream limit of the flooding affecting community. The surcharges indicate the difference between the With and Without Floodway WSELs. The use of Without Floodway WSELs from the base conditions model ensures that the floodway encroachments do not increase the WSELs more than 0.5 foot above the base conditions 1-percent-annual-chance WSELs.

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the WSEL of the 1-percent-annual-chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.

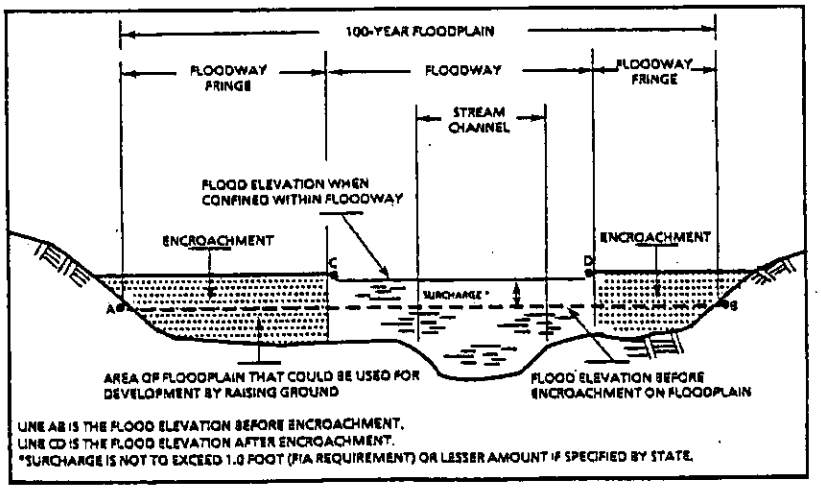


Figure 1 – Floodway Schematic

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY[3]	WITHOUT FLOODWAY[4]	WITH FLOODWAY[3]	INCREASE
MISSISSIPPI RIVER								
A	1,623	2,063/658	54,110	2.8	704.8	704.8	705.1	0.3
B	8,433	5,653/5,290	109,807	1.4	705.2	705.2	705.5	0.3
C	12,448	4,256/3,885	74,554	2.0	705.4	705.4	705.7	0.3
D	13,478	1,518/1,190	36,044	4.2	705.3	705.3	705.6	0.3
E	17,981	2,500/2,500	43,772	3.4	706.1	706.1	706.3	0.2
F	22,431	1,193/1,193	35,303	4.2	706.3	706.2	706.5	0.3
G	27,421	794/794	25,183	6.0	706.7	706.5	706.9	0.4
H	35,266	674/674	23,204	6.5	708.4	708.2	708.5	0.3
I	42,153	1,288/1,288	35,721	4.2	709.8	709.7	710.0	0.3
J	48,898	3,695/1,150	69,476	2.2	711.3	711.2	711.5	0.3
K	54,470	2,529/2,150	49,233	3.0	712.4	712.3	712.6	0.3
L	56,855	3,540/3,250	67,319	2.2	712.8	712.7	713.0	0.3
M	62,740	3,240/2,600	61,534	2.4	713.3	713.2	713.5	0.3
N	65,722	683/490	15,991	6.3	713.5	713.4	713.6	0.2
O	69,762	1,365/600	23,032	4.3	714.3	714.2	714.6	0.4
P	74,137	961/500	30,012	3.3	715.8	715.7	716.1	0.4

[1]Feet Above Limit of Flooding Affecting Community
[2]Total Width / Width within City of St. Paul
[3]Existing Conditions
[4]Base Conditions (1989)

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF ST. PAUL, MN
(RAMSEY COUNTY)

FLOODWAY DATA

MISSISSIPPI RIVER

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by detailed methods. Whole-foot Base Flood Elevations (BFEs) derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

7.0 OTHER STUDIES

This report either supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the FEMA, Federal Insurance and Mitigation Division, 536 South Clark Street, Sixth Floor, Chicago, Illinois 60605.

9.0 BIBLIOGRAPHY AND REFERENCES

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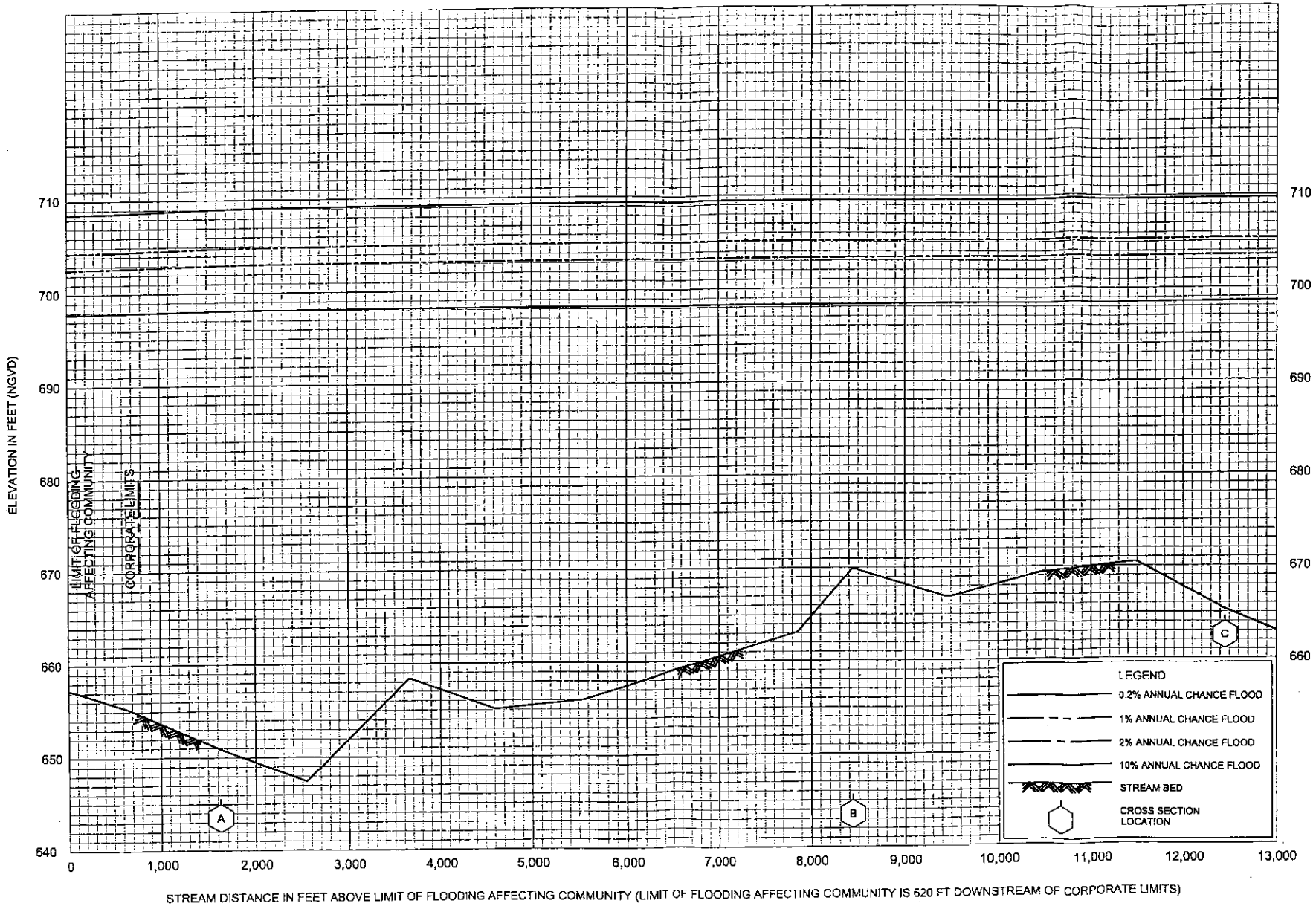
7. U.S. Army Corps of Engineers, Upper Mississippi River Water-Surface Profiles, River Mile 0.0 to River Mile 847.5, November 1979.

Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Rate Map, City of St. Paul, Minnesota, August 3, 1989 and July 2, 1991.



FLOOD PROFILES

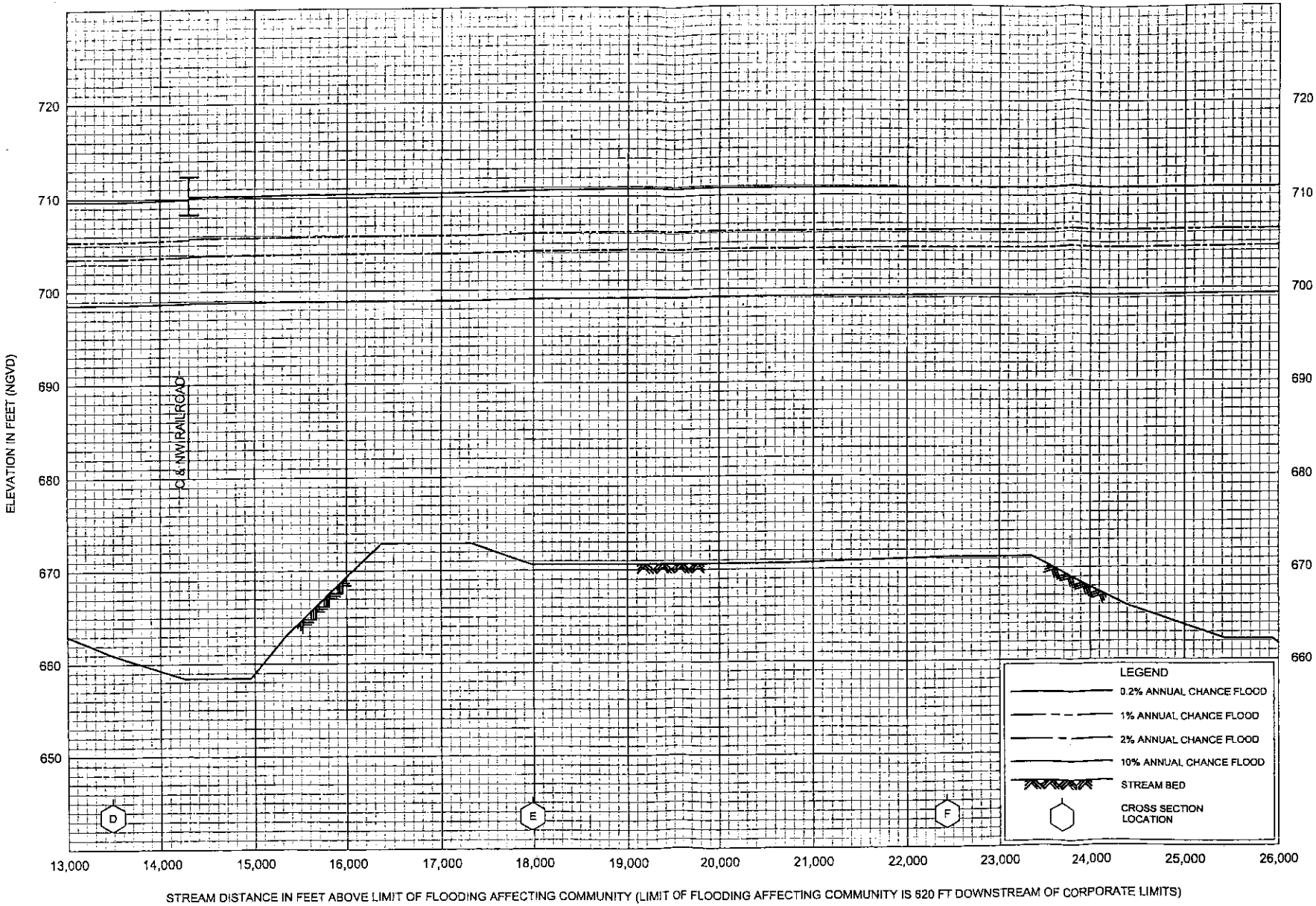
MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF ST. PAUL, MN

(RAMSEY COUNTY)

01P



FLOOD PROFILES

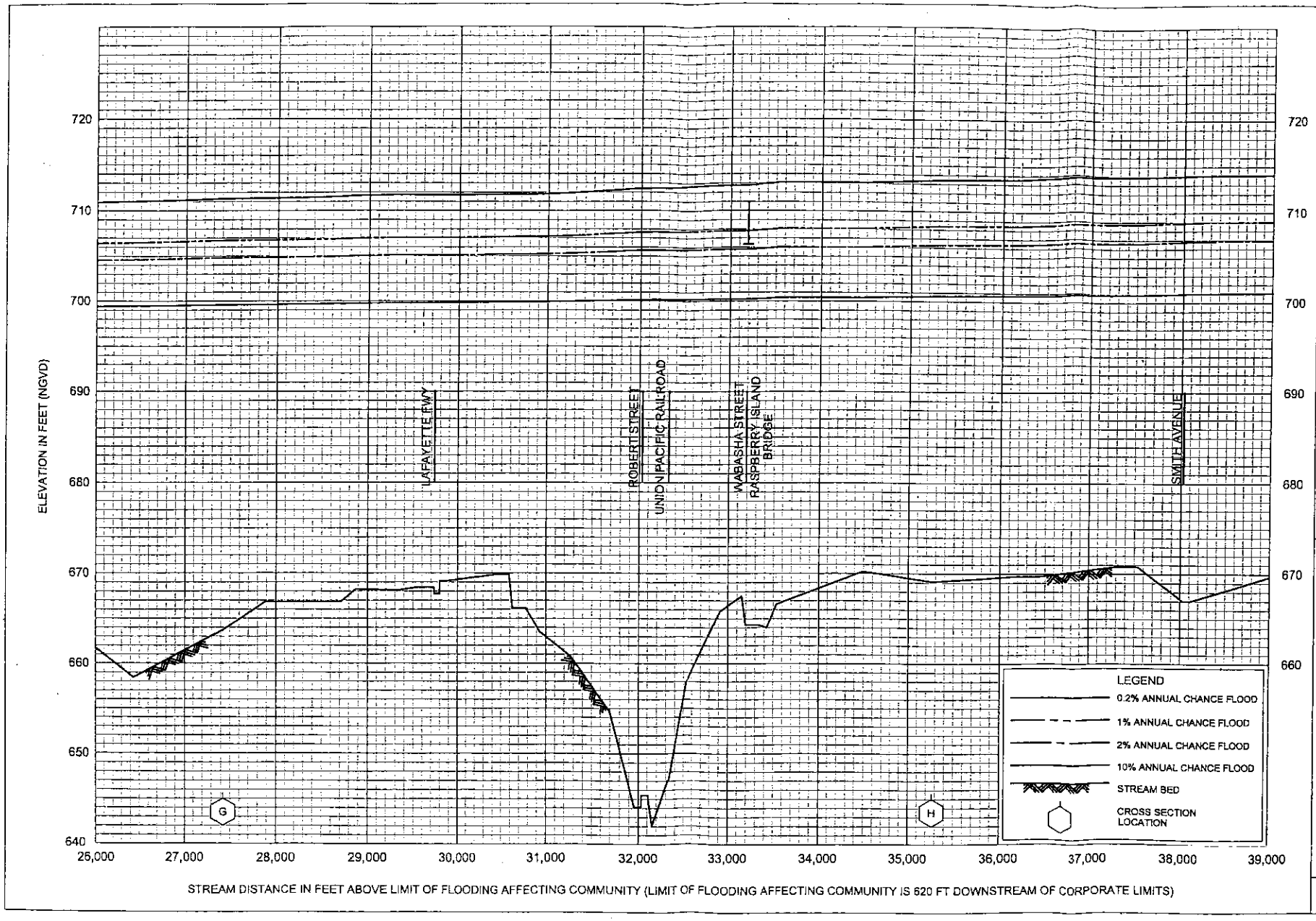
MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF ST. PAUL, MN

(RAMSEY COUNTY)

02P



FLOOD PROFILES

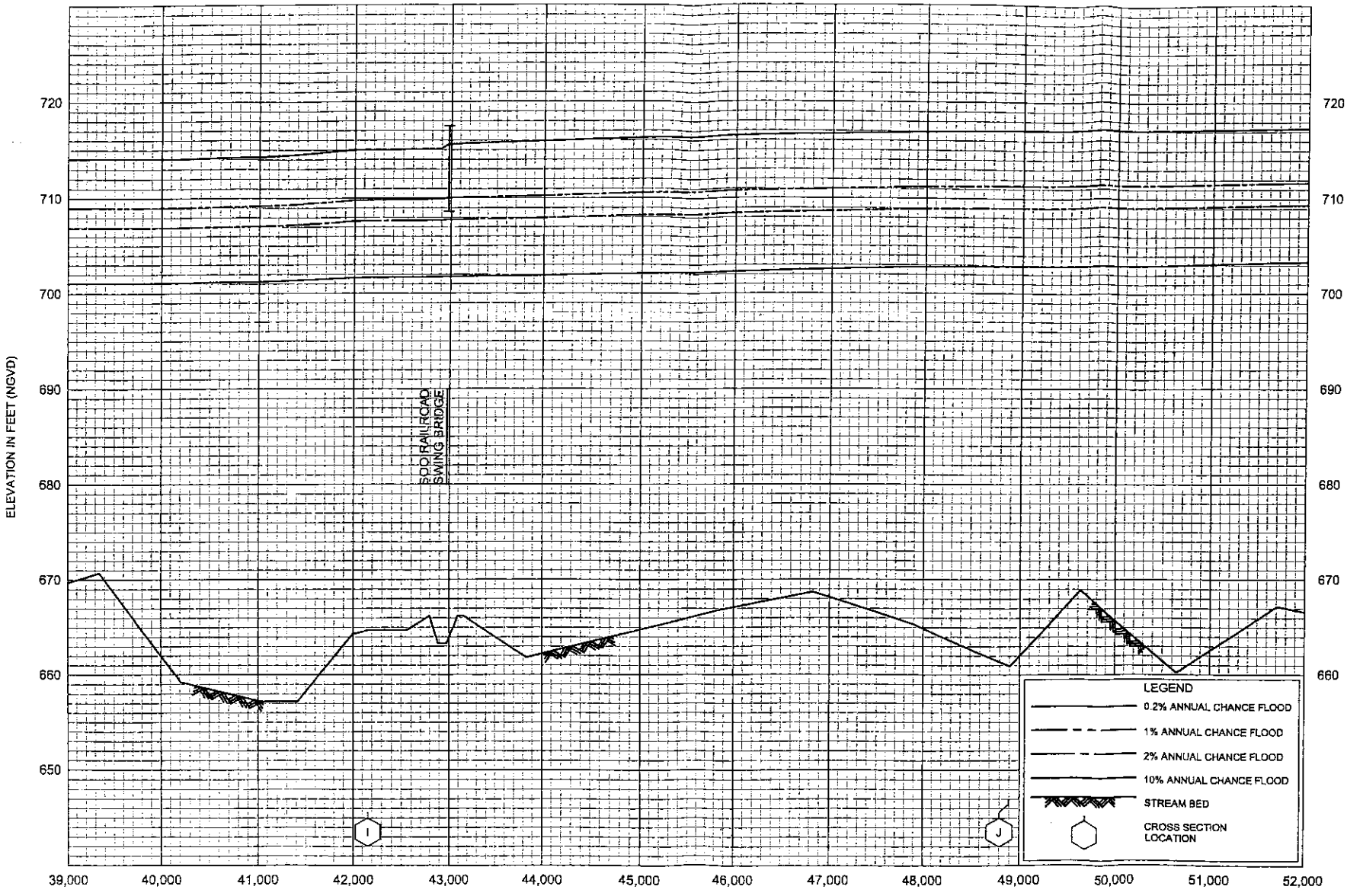
MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF ST. PAUL, MN

(RAMSEY COUNTY)

03P



FLOOD PROFILES

MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF ST. PAUL, MN

(RAMSEY COUNTY)

04P

Appendix C

Floodplain Management Regulations

Chapter 72. Floodplain Management Regulations

- Sec. 72.01. Definitions.
- Sec. 72.02. Floodplain management.

Sec. 72.01. Definitions.

As used in this chapter, the following terms shall have the meanings ascribed to them in this section:

Floodplain. An area is a floodplain when it adjoins a watercourse which has been or hereafter may be covered by the regional flood.

Regional flood. A flood which is representative of large floods known to have occurred generally in Minnesota and reasonably characteristic of what can be expected to occur on an average frequency in the magnitude of the 100-year flood of the Mississippi River which is at the Robert Street Bridge fourteen and eighty-two one-hundredths (14.82) feet, which is equivalent to the U.S.G.S. Datum, 1912 adjustment, elevation of seven hundred nine and forty one-hundredths (709.40) feet.

(Code 1956, § 57.01)

Sec. 72.02. Floodplain management.

The following provisions shall apply to properties which are wholly or partially located within a floodplain in the City of Saint Paul:

(1) *Land development.* Subdivision proposals and other new developments shall be reviewed by the City of Saint Paul Planning Commission to assure that the following requirements are met:

a. All such proposals must be consistent with the need to minimize flood damage.

b. All public utilities and facilities, such as sewer, gas, electrical and water systems, must be located and constructed to minimize or eliminate flood damage.

c. Adequate drainage must be provided to reduce exposure to flood hazards.

(2) *Building permits.* New construction and any substantial improvements to existing structures, including the prefabricated and mobile homes, shall conform to the following guidelines prior to the issuance of any building permits by the City of Saint Paul:

a. The project must be designed or modified to prevent flotation, collapse or lateral movement of the structure.

b. Construction materials and utility equipment must be resistant to flood damage.

c. Construction methods and practices must be such that they will minimize flood damage.

(3) *Sanitary sewage systems.* The sanitary sewage system proposals shall be reviewed by the public works department to assure that the following requirements are met:

a. The sanitary sewer system must be designed to minimize or eliminate the infiltration of floodwaters into the system and to minimize or eliminate discharge from the system into floodwaters.

b. On-site waste disposal system must be located to avoid impairment of them or contamination from them during flooding.

(4) *Water supply systems.* The water supply system proposals shall be reviewed by the city water utility to assure that they are designed to minimize or eliminate the infiltrations of floodwaters into the system and to minimize or eliminate discharge from the system into floodwaters.

(Code 1956, 57.02)

Appendix D

River Corridor Overlay Zoning Code

Chapter 68. Zoning Code--River Corridor Overlay Districts*

- Sec. 68.101. Intent and purpose.
- Sec. 68.102. Establishment.
- Sec. 68.103. Compliance.
- Sec. 68.211. Permitted uses.
- Sec. 68.212. Standards for permitted uses in the RC1 Floodway District.
- Sec. 68.213. Conditional uses.
- Sec. 68.214. Standards for conditional uses in the RC1 Floodway District.
- Sec. 68.221. Permitted uses.
- Sec. 68.222. Standards for permitted uses in the RC2 Flood Fringe District.
- Sec. 68.223. Conditional uses.
- Sec. 68.224. Standards for conditional uses in the RC2 Flood Fringe District.
- Sec. 68.225. Standards for all RC2 Flood Fringe Uses.
- Sec. 68.231. Intent.
- Sec. 68.232. Permitted uses.
- Sec. 68.233. Standards for permitted uses in the RC3 Urban Open District.
- Sec. 68.234. Conditional uses.
- Sec. 68.241. Intent.
- Sec. 68.242. Permitted uses.
- Sec. 68.243. Standards for permitted uses in the RC4 Urban Diversified District.
- Sec. 68.244. Conditional uses.
- Sec. 68.301. Public utilities, railroads, roads and bridges.
- Sec. 68.401. Objectives.
- Sec. 68.402. Protection of shorelands, floodplains, wetlands and bluffs.
- Sec. 68.403. Protection of wildlife and vegetation.
- Sec. 68.404. Protection of water quality.
- Sec. 68.501. Application.
- Sec. 68.502. Other permits.
- Sec. 68.503. Factors considered.
- Sec. 68.504. Conditions imposed.
- Sec. 68.601. Variances.
- Sec. 68.701. Floodplain nonconforming structures.
- Sec. 68.801. Amendments.
- Sec. 68.802. Areas protected by dikes, levies and floodwalls.
- Sec. 68.901. Administration.
- Sec. 68.902. Notify commissioner of natural resources.
- Sec. 68.903. Notice of increased insurance costs.

***Editor's note**--C.F. No. 03-241, § 2, adopted March 26, 2003, amended the Code by, in effect, repealing former ch. 65, and adding similar provisions as a new ch. 68. Ord. No. 03-241, § 3, renumbered former ch. 68 as a new ch. 65. Former ch. 65 derived from Ord. No. 16876, adopted January 28, 1982; Ord. No. 16931, adopted June 15, 1982; Ord. No. 16956, adopted September 9, 1982; Ord. No. 17116, adopted March 22, 1984; Ord. No. 17502, adopted October 13, 1987; C.F. No. 91-531, adopted May 6, 1993; Ord. No. 93-1718, adopted December 14, 1993; Ord. No. 95-1140, adopted October 18, 1995; and Ord. No. 95-1444, adopted January 17, 1996.

ARTICLE I. 68.100. GENERAL PROVISIONS

Sec. 68.101. Intent and purpose.

(a) The River Corridor Overlay District and its subclassifications, RC1, RC2, RC3, RC4, are map overlay districts, designed to provide comprehensive floodplain and river bluff management for the city in accordance with the policies of Minnesota Statutes (Chapters 103 and 116G), Minnesota Regulations (MEQC 54) and Governor's Executive Order No. 79-19.

(b) It is the purpose of this chapter:

(1) To protect and preserve the Mississippi River Corridor as a unique and valuable resource for the benefit of the health, safety and welfare of the citizens of the city and the state;

(2) To prevent and mitigate irreversible damage to the Mississippi River Corridor;

(3) To protect and preserve the Mississippi River Corridor as an essential element in the federal, state, regional and local recreation, transportation, sewer and water systems;

(4) To maintain the river corridor's value and utility for residential, commercial, industrial and public purposes;

(5) To protect and preserve the Saint Paul Mississippi River Corridor's biological and ecological functions;

(6) To preserve and enhance the Saint Paul Mississippi River Corridor's aesthetic, cultural, scientific and historic functions;

(7) To guide development of the floodplain so as to minimize loss of life, threats to health, and private and public economic loss caused by flooding; and

(8) To guide floodplain development in order to lessen the adverse effects of floods, but not to reduce or eliminate flooding.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.102. Establishment.

(a) This chapter shall apply to all lands within the city shown on the river corridor overlay zoning district maps as being located within the boundaries of the RC1 River Corridor Floodway District, RC2 River Corridor Flood Fringe District, RC3 River Corridor Urban Open Space District and RC4 River Corridor Urban Diversified District.

(b) The river corridor overlay zoning district maps accompanying this river corridor code, together with all matters attached thereto, are hereby adopted by reference and made a part of this code as if the matters and information set forth therein were fully described herein. The attached material shall include:

(1) The flood insurance study for the city prepared by the Federal Emergency Management Agency (FEMA), dated April 2, 2003; and

(2) The Flood Insurance Rate Map, dated April 2, 2003.

(c) The RC1 Floodway District shall include those areas designated as floodway and Zone AE without a floodway designation on the Flood Insurance Rate Map. The RC2 Flood Fringe District shall include those areas designated as Zone AE and outside of the floodway on the Flood Insurance Rate Map.

(d) Within these districts all uses not allowed as permitted uses or as permitted uses subject to special conditions shall be and are hereby prohibited. Legal nonconforming structures or uses existing on the effective date of this chapter or amendment thereto will be permitted to continue as provided in section 62.102 and section 65.900.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.103. Compliance.

(a) *Permit required.* A permit issued by the zoning administrator in conformance with the provisions of this chapter shall be secured prior to the erection, addition, or alteration of any building, structure, or portion thereof; prior to the use or change of use of a building, structure or land; prior to the change or extension of a nonconforming use; and prior to the placement of fill, excavation of materials, or the storage of materials or equipment within the flood plain.

(b) *Compliance of uses or occupations required.* No use or occupation of any lands, for any purpose whatsoever, shall hereafter be permitted within the River Corridor District without full compliance with the terms of this chapter and other applicable laws.

(c) *Compliance of structures, fill, etc.* No structure, fill, material or object shall hereafter be placed on or removed from lands within the River Corridor District, and no structures or other object shall hereafter be located, used, constructed, extended, converted or altered within the district without full compliance with this chapter and other applicable laws.

(d) *Submission of site plan.* A site plan shall be submitted to and approved by the planning commission in accordance with section 62.108 before a permit is issued for any development on property wholly or partially located within the River Corridor District. For any development in the RC1 and RC2 districts, the site plan shall include the regulatory flood protection elevation; the proposed elevation of fill; the proposed elevation of the lowest floor of new structures, altered structures and additions to existing structures; and the proposed elevation to which structures will be floodproofed.

(e) *Review of building permits for adequate floodproofing.* All building permits for structures proposed to be floodproofed in the RC1 and RC2 districts shall be reviewed to determine whether the structures will be adequately floodproofed.

(f) *Certification.* Before a certificate of occupancy is issued for any development in the RC1 and RC2 districts, the applicant shall submit to the zoning administrator certification by a registered professional engineer, registered architect, registered landscape architect or registered land surveyor that the finished fill and building elevations were accomplished in compliance with the provisions of this chapter. Finished fill and building elevations shall be verified by ground surveys. Floodproofing measures shall be certified by a registered professional engineer or registered architect.

(C.F. No. 03-241, § 2, 3-26-03)

ARTICLE II. 68.200. RIVER CORRIDOR OVERLAY DISTRICTS

Division 1. 68.210. RC1 River Corridor Floodway Overlay District

Sec. 68.211. Permitted uses.

(a) The following uses shall be permitted within the RC1 Floodway District to the extent that they are not prohibited by any other provision of the zoning code or other ordinances. The uses are subject to the conditions of the underlying zoning district, to the standards for permitted uses in the Floodway District, section 68.212 and to the River Corridor Standards and Criteria, section 68.212.

(1) Nonstructural industrial-commercial uses, such as open-loading areas, parking areas, interior service roads, airport service roads and airport runways.

(2) Public and private recreational uses such as golf courses, tennis courts, driving ranges, archery ranges, picnic and camp grounds, boat launching and beaching areas or ramps, swimming areas, parks, playgrounds, wildlife and nature preserves, game farms, fish hatcheries, and hiking, bicycling, horseback or recreational vehicle areas and trails, and other open space uses.

(3) Accessory residential uses such as lawns, gardens, parking areas and play areas.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.212. Standards for permitted uses in the RC1 Floodway District.

(a) The use shall not obstruct flood flows to the point that it increases the one (1) percent chance flood elevation and shall not involve structures, fill, obstruction, excavations or storage of materials or equipment.

(b) The use shall have a low flood damage potential.

(c) The use shall not adversely affect the hydraulic capacity of the channel or floodway or any tributary to the main stream or of any ditch or other drainage facility or system.

(d) No use shall be permitted which is likely to cause pollution of waters, as defined in Minnesota Statutes, Section 115.01, unless adequate safeguards, approved by the state pollution control agency, are provided.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.213. Conditional uses.

The following uses shall be permitted within the RC1 Floodway District to the extent they are not prohibited by any other provision of the zoning code or other ordinances. The uses shall be permitted only upon the application and issuance of a conditional use permit by the planning commission. The uses are subject to the conditions of the underlying zoning district, to the standards for conditional uses in the Floodway District, section 68.214 below, and to the River Corridor Standards and Criteria, section 68.400 below.

(a) Railroads, highways, streets, alleys, access roads, bridges, sewers, utilities, utility transmission lines and pipe lines.

(b) Marinas, boat rentals, docks, piers, mooring anchors, wharves, water-control structures and navigation facilities.

(c) Storage yards or areas for equipment, machinery or bulk materials.

(d) Structures accessory to permitted uses, section 68.212, or conditional uses of this section.

(e) Placement of fill.

(f) Structural works for flood control such as levees, dikes and floodwalls constructed to any height where the intent is to protect individual structures.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.214. Standards for conditional uses in the RC1 Floodway District.

(a) No structure (temporary or permanent), fill deposit (including fill for roads and levees), obstruction, storage of materials or equipment, or other use may be allowed which will cause an increase in the height of the regional flood or cause an increase in flood damages in the reach or reaches affected.

(b) Fill shall be protected from erosion by vegetative cover, mulching, riprap or other acceptable method.

(c) Accessory structures shall not be designed for human habitation.

(d) Accessory structures shall be constructed and placed on the building site so as to offer the minimum obstruction to the flow of floodwaters.

(1) Whenever possible, structures shall be constructed with the longitudinal axis parallel to the direction of flood flow; and

(2) So far as practicable, structures shall be placed approximately on the same flood flow lines as those of adjoining structures.

(e) All accessory structures must be elevated on fill so that the lowest floor, including basement floor, is at or above the regulatory flood protection elevation. The finished fill elevation for accessory structures shall be no lower than one (1) foot below the regulatory flood protection elevation and the fill shall extend at such elevation at least fifteen (15) feet beyond the outside limits of the structure erected thereon.

(f) As an alternative to elevation on fill, accessory structures may be structurally dry floodproofed in accordance with the FP-1 or FP-2 floodproofing classification in the state building code or floodproofed to the FP-3 or FP-4 floodproofing classification in the state building code, provided the accessory structure constitutes a minimal investment, does not exceed five hundred (500) square feet in size and for a detached garage, the detached garage must be used solely for parking of vehicles and limited storage. All floodproofed accessory structures must meet the following additional standards, as appropriate:

(1) The structure must be adequately anchored to prevent flotation, collapse or lateral movement of the structure and shall be designed to equalize hydrostatic flood forces on exterior walls; and

(2) Any mechanical and utility equipment in a structure must be elevated to or above the regulatory flood protection elevation or properly floodproofed.

(g) Storage of materials or equipment may be allowed if readily removable from the area within the time available after a flood warning and in accordance with a plan approved by the planning commission.

(h) Structural works for flood control that will change the course, current or cross-section of protected wetlands, or public waters shall be subject to the provisions of Minnesota Statutes, Chapter 103.G. Community-wide structural works for flood control intended to remove areas from the regulatory floodplain shall not be allowed in the floodway.

(i) A levee, dike or floodwall constructed in the floodway shall not cause an increase to the regional flood and the technical analysis must assume equal conveyance or storage loss on both sides of a stream.

(j) No use shall be permitted which is likely to cause pollution of waters, as defined in Minnesota Statutes, Section 115.01, unless adequate safeguards, approved by the state pollution-control agency, are provided.

(C.F. No. 03-241, § 2, 3-26-03)

Division 2. 68.220. RC2 River Corridor Flood Fringe Overlay District

Sec. 68.221. Permitted uses.

Permitted uses in the RC2 Flood Fringe Overlay District shall be those uses of land or structures listed as permitted uses in the underlying zoning district, except that mining, extraction operations, the disposal of waste materials and landfills shall not be permitted. The uses are subject to the conditions of the underlying zoning district, to the standards for permitted uses in the Flood Fringe District, section 68.222 below, to the Standards for All Flood Fringe Uses, section 68.225 below, and River Corridor Standards and Criteria, section 68.400 below.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.222. Standards for permitted uses in the RC2 Flood Fringe District.

(a) All structures, including accessory structures, must be elevated on fill so that the lowest floor including basement floor is at or above the regulatory flood protection elevation. The finished fill elevation for structures shall be not lower than one foot below the regulatory flood protection elevation and the fill shall extend at such elevation at least 15 feet beyond the outside limits of the structure erected thereon.

(b) As an alternative to elevation on fill, accessory structures that constitute a minimal investment and that do not exceed 500 square feet for the outside dimension at ground level may be internally floodproofed in accordance with section 68.214 (f).

(c) The storage of any materials or equipment shall be elevated on fill to the regulatory flood protection elevation.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.223. Conditional uses.

The following uses shall be permitted within the RC2 Flood Fringe District to the extent they are not prohibited by any other provision of the zoning code or other ordinances, except that mining, extraction operations, the disposal of waste materials and landfills shall not be permitted. The use shall be permitted only upon the application and issuance of a conditional use permit by the planning commission. The uses are subject to the conditions of the underlying zoning district, to the standards for conditional uses in the Flood Fringe District, section 68.224 below, to the Standards for All Flood Fringe Uses, section 68.224 below, and to the River Corridor Standards and Criteria, section 68.400.

(a) Any structure that is not elevated on fill or floodproofed in accordance with section 68.222(a) or (b) above.

(b) Any use of land that does not comply with the standards in section 68.222(c).

(c) Sewage treatment plants.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.224. Standards for conditional uses in the RC2 Flood Fringe District.

(a) Alternative elevation methods other than the use of fill may be utilized to elevate a structure's lowest floor above the regulatory flood protection elevation. These alternative methods may include the use of stilts, pilings, parallel walls or above grade, enclosed areas such as crawl spaces or tuck-under garages. The base or floor of an enclosed area shall be considered above grade and not a structure's basement or lowest floor if: 1) the enclosed area is above grade on at least one (1) side of the structure; 2) is designed to internally flood and is constructed with flood-resistant materials; and 3) is used solely for parking of vehicles, building access or storage. The above-noted alternative elevation methods are subject to the following additional standards:

(1) *Design and certification.* The structure's design and as-built condition must be certified by a registered professional engineer or architect as being in compliance with the general design standards of the State Building Code and, specifically, that all electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities must be at or above the regulatory flood protection elevation or be designed to prevent floodwater from entering or accumulating within these components during times of flooding.

(2) *Specific standards for above grade, enclosed areas.* Above grade, fully enclosed areas such as crawl spaces or tuck-under garages must be designed to internally flood and the design plans must stipulate:

a. The minimum area of openings in the walls where internal flooding is to be used as a floodproofing technique. When openings are placed in a structure's walls to provide for entry of floodwaters to equalize pressures, the bottom of all openings shall be no higher than one (1) foot above grade. There shall be a minimum of two openings and the openings shall be placed on at least two walls of the structure. Openings may be equipped with screens, louvers, valves or other coverings or devices, provided that they permit the automatic entry and exit of floodwaters.

b. That the enclosed area will be designed of flood-resistant materials in accordance with the FP-3 or FP-4 classifications in the State Building Code and shall be used solely for building access, parking of vehicles or storage.

(b) Basements, as defined by section 60.203.B for this river corridor code, shall be subject to the following:

(1) Residential basement construction shall not be allowed below the regulatory flood protection elevation except as authorized in subsection (f) of this section.

(2) Nonresidential basements may be allowed below the regulatory flood-protection elevation, provided the basement is protected in accordance with subsection (c) or (f) of this section.

(c) All areas of nonresidential structures including basements to be placed below the regulatory flood protection elevation shall be structurally dry floodproofed in accordance with the FP-1 or FP-2 floodproofing classifications in the State Building Code. This shall require making the structure watertight, with the walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy. Structures floodproofed to the FP-3 or FP-4 classification shall not be permitted.

(d) The storage or processing of materials that are, in times of flooding, flammable, explosive or potentially injurious to human, animal or plant life is prohibited. Storage of other materials or equipment may be allowed if readily removable from the area within the time available after a flood warning and in accordance with a plan approved by the planning commission, or if elevated above the regulatory flood protection elevation by alternative methods which meet the requirements of subsection (a) above.

(e) No new construction, addition or modification to existing sewage treatment plants shall be permitted within the floodplain unless emergency plans and procedures for action to be taken in the event of flooding are prepared, filed with and approved by the Minnesota Pollution Control Agency. The emergency plans and procedures must provide for measures to prevent introduction of any pollutant or toxic materials into the floodwaters.

(f) When the Federal Emergency Management Agency has issued a conditional letter of map revision-fill (CLOMR-F) for vacant parcels of land elevated by fill to the one (1) percent chance flood elevation, the area elevated by fill remains subject to the provisions of this chapter. A structure may be placed on the area elevated by fill with the lowest floor below the regulatory flood protection elevation provided the structure meets the following provisions:

(1) No floor level or portion of a structure that is below the regulatory flood protection elevation shall be used as habitable space or for storage of any property, materials, or equipment that might constitute a safety hazard when contacted by floodwaters. Habitable space shall be defined as any space in a structure used for living, sleeping, eating or cooking. Bathrooms, toilet compartments, closets, halls, storage rooms, laundry or utility space, and similar areas are not considered habitable space.

(2) For residential and nonresidential structures, the basement floor may be placed below the regulatory flood protection elevation subject to the following standards:

a. The top of the immediate floor above any basement area shall be placed at or above the regulatory flood protection elevation.

b. Any area of the structure placed below the regulatory flood protection elevation shall meet the "reasonably safe from flooding" standards in the Federal Emergency Management Agency (FEMA) publication entitled "Ensuring that Structures Build on Fill In or Near Special Flood Hazard Areas Are Reasonably Safe From Flooding," Technical Bulletin 10-01, a copy of which is hereby adopted by reference and made part of this chapter. In accordance with the provisions of this chapter, and specifically section 68.504(g), the applicant shall submit documentation that the structure is designed and built in accordance with either the "Simplified Approach" or "Engineered Basement Option" found in FEMA Technical Bulletin 10-01.

c. If the ground surrounding the lowest adjacent grade to the structure is not at or above the regulatory flood protection elevation, then any portion of the structure that is below the regulatory flood protection elevation must be floodproofed consistent with any of the FP-1 through FP-4 floodproofing classifications found in the State Building Code.

(C.F. No. 03-241, § 2, 3-26-03; C.F. No. 03-1028, § 1, 4-7-04)

Sec. 68.225. Standards for all RC2 Flood Fringe Uses.

(a) *Vehicular access.* All new principal structures must have vehicular access at or above an elevation not more than two (2) feet below the regulatory flood protection elevation. If a modification to this requirement is granted, the planning commission must specify limitations on the period of use or occupancy of the structure for times of flooding and only after determining that adequate flood warning time and local flood emergency response procedures exist.

(b) *Commercial uses.* Accessory land uses, such as yards, railroad tracks and parking lots may be at elevations lower than the regulatory flood protection elevation. However, a permit for such facilities to be used by the employees or the general

public shall not be granted in the absence of a flood warning system that provides adequate time for evacuation if the area would be inundated to a depth greater than two (2) feet or be subject to flood velocities greater than four (4) feet per second upon occurrence of the regional flood.

(c) *Manufacturing and industrial uses.* Measures shall be taken to minimize interference with normal plant operations. Certain accessory land uses such as yards and parking lots may be at lower elevation subject to requirements set out in subdivision (b) above. In considering permit applications, due consideration shall be given to needs of an industry whose business requires that it be located in floodplain areas.

(d) *Standards pertaining to fill.* Fill shall be properly compacted and the slopes shall be properly protected by the use of riprap, vegetative cover or other acceptable method. The Federal Emergency Management Agency (FEMA) has established criteria for removing the special flood hazard area designation for certain structures properly elevated on fill above the one (1) percent chance flood elevation. FEMA's requirements incorporate specific fill compaction and side slope protection standards for multistructure or multilot developments. These standards should be investigated prior to the initiation of site preparation if a change of special flood hazard area designation will be requested.

(e) *Developments not to affect hydraulic capacities.* Floodplain developments shall not adversely affect the hydraulic capacity of the channel and adjoining floodplain of any tributary watercourse or drainage system where a floodway or other encroachment limit has not been specified on the official zoning map.

(f) *Manufactured homes.* Manufactured homes must meet all the density, setback, flood protection and other requirements for residential use of the zoning code and all requirements of the housing and building code. All manufactured homes must be securely anchored to an adequately anchored foundation system that resists flotation, collapse and lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable state or local anchoring requirements for resisting wind forces.

(g) *Travel trailers.* Travel trailers shall not be used for living quarters, and are exempt from the provisions of this ordinance if they have current licenses required for highway use, are highway ready meaning on wheels or the internal jacking system, are attached to the site only by quick disconnect type utilities commonly used in campgrounds and trailer parks, and the travel trailer/travel vehicle has no permanent structural type additions attached to it. Travel trailers and travel vehicles lose this exemption when development occurs on the parcel exceeding $500 dollars for a structural addition to the travel trailer/travel vehicle or and accessory structure such as a garage or storage building. The travel trailer/travel vehicle and all additions and accessory structures will then be treated as a new structure and shall be subject to the elevation/flood proofing requirements and use of land restrictions specified in this ordinance. No new commercial travel trailer or travel vehicle parks shall be allowed in the RC1 floodway or RC2 flood fringe overlay districts.

(h) *Pollution of waters.* No use shall be permitted which is likely to cause pollution of waters, as defined in Minnesota Statutes, Section 115.01, unless adequate safeguards, approved by the state pollution control agency, are provided.

(C.F. No. 03-241, § 2, 3-26-03; C.F. No. 03-1028, § 1, 4-7-04)

Division 3. 68.230. RC3 River Corridor Urban Open Overlay District

Sec. 68.231. Intent.

It is intended that lands and waters within this district shall be managed to conserve and protect the existing and potential recreational, scenic, natural and historic resources. Open space provided in the open river corridor is for public use and the protection of unique natural and scenic resources. The existing transportation role of the river in this district will be protected.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.232. Permitted uses.

In the RC3 River Corridor Urban Open Overlay District, use of the land, location and erection of new buildings or structures, and the alteration, enlargement and moving of existing buildings or structures from other locations or districts shall conform to those specified uses and standards of the corresponding underlying district as established in section 60.303 to the extent that they are not prohibited by any other provision of the zoning code. In addition, permitted uses shall be subject to the following applicable standards and those in section 68.400 et seq.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.233. Standards for permitted uses in the RC3 Urban Open District.

(a) Development shall be limited to forty (40) feet in height.

(b) The development of new and expansion of existing commercial and industrial uses shall only be on lands which are on the landward side of blufflines.

(c) Mining and extraction operations shall not be permitted.

(d) No use shall be permitted which is likely to cause pollution of water, as defined in Minnesota Statutes, Section 115.01, unless adequate safeguards, approved by the state pollution control agency, are provided.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.234. Conditional uses.

(a) Conditional uses are those specified by the corresponding underlying district as established in section 60.303 to the extent that they are not prohibited by any other provision of the zoning code. They are subject to standards specified in the corresponding underlying district section and to those specified in sections 68.233 and 68.400 et seq.

(b) Such uses will be permitted only upon application and issuance of a conditional use permit by the planning commission.

(C.F. No. 03-241, § 2, 3-26-03)

Division 4. 68.240. RC4 River Corridor Urban Diversified Overlay District

Sec. 68.241. Intent.

It is intended that the lands and waters in this district be used and developed to maintain the present diversity of commercial, industrial, residential and public uses of the lands, including the existing transportation use of the river; to protect historical sites and areas, natural scenic and environmental resources; and to expand public access to and enjoyment of the river. New commercial, industrial, residential and other uses are permitted if they are compatible with these goals.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.242. Permitted uses.

In the RC4 River Corridor Urban Diversified overlay district, use of the land, location and erection of new buildings or structures and the alteration, enlargement and moving of existing buildings or structures from other locations or districts shall conform to those specified uses and standards of the corresponding underlying district as established in section 60.303 to the extent that they are not prohibited by any other provision of the zoning code. In addition, permitted uses shall be subject to the standards specified in section 68.400 et seq.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.243. Standards for permitted uses in the RC4 Urban Diversified District.

No use shall be permitted which is likely to cause pollution of waters, as defined in Minnesota Statutes, Section 115.01, unless adequate safeguards, approved by the state pollution control agency, are provided.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.244. Conditional uses.

(a) Conditional uses are those specified by the corresponding underlying district as established in section 60.303 to the extent that they are not prohibited by any other provision of the zoning code. They are subject to standards specified in the corresponding underlying district section and to those specified in section 68.400 et seq.

(b) Such uses will be permitted only upon application and issuance of a conditional use permit by the planning commission.

(C.F. No. 03-241, § 2, 3-26-03)

ARTICLE III. 68.300. PUBLIC UTILITIES, RAILROADS, ROADS AND BRIDGES

Sec. 68.301. Public utilities, railroads, roads and bridges.

(a) *Public utilities.* All public utilities and facilities such as gas, electrical, sewer and water supply systems to be located in the floodplain shall be floodproofed in accordance with the state building code or elevated to above the regulatory flood protection elevation.

(b) *Public transportation facilities.* Railroad tracks, roads and bridges to be located within the floodplain shall comply with sections 68.210 and 68.220 of this chapter. Elevation to the regulatory flood protection elevation may be required by the planning commission where the failure or interruption of these transportation facilities would result in danger to the public health or safety or where such facilities are essential to the orderly functioning of the area. Minor or auxiliary roads or railroads may be constructed at a lower elevation where failure or interruption of transportation services would not endanger the public health or safety.

(c) *On-site sewage treatment and water supply systems.* Where public utilities are not provided:

(1) On-site water supply systems must be designed to minimize or eliminate infiltration of floodwaters into the systems; and

(2) New or replacement on-site sewage treatment systems must be designed to minimize or eliminate infiltration of floodwaters into the systems and discharges from the systems into floodwaters and they shall not be subject to impairment or contamination during times of flooding.

Any sewage treatment system designed in accordance with the state's current statewide standards for on-site sewage treatment systems shall be determined to be in compliance with this section.

(C.F. No. 03-241, § 2, 3-26-03)

ARTICLE IV. 68.400. RIVER CORRIDOR STANDARDS AND CRITERIA

Sec. 68.401. Objectives.

The objective of standards and criteria is to maintain the aesthetic integrity and natural environment of the river corridor in conformance to the St. Paul Mississippi River Corridor Plan by reducing the effects of poorly planned shoreline and bluffline development; providing sufficient setback for sanitary facilities; preventing pollution of surface and groundwater; minimizing flood damage; preventing soil erosion; and implementing metropolitan plans, policies and standards.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.402. Protection of shorelands, floodplains, wetlands and bluffs.

(a) *Generally.* Development shall be conducted so that the smallest practical area of land be developed at any one time and that each area be subjected to as little erosion or flood damage as possible during and after development.

(b) *Placement of structures.*

(1) The following minimum setbacks for each class of public waters as described in Minnesota Regulations NR-82 shall apply to all structures except those specified as exceptions in subsection (7) below.

a. For natural environment waters at least two hundred (200) feet from the normal high water mark for lots not served by

public sewer and at least one hundred fifty (150) feet from the ordinary high water mark for lots served by public sewers.

b. For general development waters at least seventy-five (75) feet from the normal high water mark for lots not served by public sewer and at least fifty (50) feet from the ordinary high water mark for lots served by public sewer.

(2) No commercial or industrial development shall be permitted on slopes greater than twelve (12) percent.

(3) No residential development shall be permitted on slopes greater than eighteen (18) percent.

(4) Bluff development shall take place at least forty (40) feet landward of all blufflines.

(5) Transportation, utility and other transmission service facilities and corridors shall avoid:

a. Steep slopes;

b. Intrusions into or over streams, valleys and open exposures of water;

c. Intrusions into ridge crests and high points;

d. Creating tunnel vistas;

e. Wetlands;

f. Forests by running along fringe rather than through them. If necessary, to route through forests, utilize open areas in order to minimize cutting;

g. Soils susceptible to erosion, which would create sedimentation and pollution problems;

h. Areas of unstable soils which would be subject to extensive slippages;

i. Areas with high water tables; and

j. Open space recreation areas.

(6) At river crossing points, public facilities, crossing corridors and other rights-of-way shall be consolidated, so that the smallest area possible is devoted to crossing.

(7) Exceptions:

a. Location of piers and docks shall be controlled by applicable state and local regulations.

b. Commercial, industrial or permitted open space uses requiring location on public waters may be closer to such waters than the setbacks specified in the standard set out in subsection (3) above.

(c) *Grading and filling.*

(1) A minimum amount of filling shall be allowed when necessary, but in no case shall the following restrictions on filling be exceeded. Furthermore, fill opportunities shall be fairly apportioned to riparian landowners. The developer shall evaluate ownership patterns, configuration and the bottom profile of each wetland basin before fill opportunities are apportioned.

(2) Grading and filling in shoreland areas (when allowable) or any other substantial alteration of the natural topography shall be controlled in accordance with the following criteria:

a. The smallest amount of bare ground shall be exposed for as short a time as feasible.

b. Temporary ground cover shall be used.

c. Methods to prevent erosion and trap sediment shall be employed.

d. Fill shall be stabilized.

(3) Only fill free of chemical pollutants and organic wastes shall be used.

(4) Total filling shall not cause the total natural flood storage capacity of the wetland to fall below the natural volume of runoff from the wetland and watershed generated by a 100-year storm, as defined by the National Weather Service.

(5) Solid waste disposal and landfill shall not be permitted in the River Corridor District.

(6) Development shall fit existing topography and vegetation with a minimum of clearing and grading.

(7) No rehabilitation slopes shall be steeper than eighteen (18) percent slope.

(8) Dredging of a shoreland or wetland shall be allowed only when it will not have adverse effect upon the wetland. Dredging when allowed shall be limited as follows:

a. It shall be located in the areas of minimum vegetation.

b. It shall not significantly change the water flow characteristics.

c. The size of the dredged area shall be limited to the absolute minimum.

d. Deposit of dredged material shall not result in a change in the current flow, or in destruction of vegetation or fish spawning areas, or in water pollution.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.403. Protection of wildlife and vegetation.

Development shall be conducted so as to avoid intrusion into animal and plant habitats.

(a) No alteration of the natural environment or removal of vegetation shall be permitted when such alteration or removal would diminish the ability of dependent wildlife to survive in the River Corridor.

(b) No wetland or bluffline vegetation shall be removed or altered except that required for the placement of structures.

(c) Clear cutting shall be prohibited except as necessary for placing approved public roads, utilities, structures and parking areas.

(d) Natural vegetation shall be restored after any construction project.

(e) Watering areas necessary for plant survival shall be maintained or provided.

(f) Development shall not cause extreme fluctuations of water levels or unnatural changes in water temperature, water quality, water currents or movements which may have an adverse impact on endangered or unique species of birds or wildlife.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.404. Protection of water quality.

(a) *Generally.* Development shall occur so that surface and subsurface water is not adversely affected by contaminants. Water quality should meet or exceed state standards.

(b) *Contamination.*

(1) Development shall not be permitted on wet soils, very shallow soils, soils with high shrink-swell or frost action potential unless it is shown that appropriate construction techniques capable of overcoming the restrictive condition will be utilized.

(2) Septic tanks and soil absorption systems shall not be permitted where public sewer systems are available. In areas where public sewers are not available, system shall be set back from the normal high water mark in accordance with the class of public waters as prescribed in Minnesota Regulations NR-82:

a. On natural environment waters, at least one hundred fifty (150) feet.

b. On general development waters, at least fifty (50) feet.

(3) Private wells shall be placed in areas not subject to flooding and up slope from any source of contamination. Wells already existing in areas subject to flooding shall be floodproofed in accordance with accepted engineering standards as defined in the Uniform State Building Code.

(4) Commercial or industrial land uses requiring the storage or production of materials or wastes that may create a pollution hazard for groundwater or surface water shall be prohibited unless the quality of both the groundwater and surface waters can conform to all applicable state and federal standards, criteria, rules and regulations.

(c) *Runoff.*

(1) The phases of development shall be planned so that only areas which are actively being developed are exposed. Other areas shall have cover of vegetation or mulch.

(2) Natural vegetation in shoreland and bluff areas shall be preserved to retard surface runoff and soil erosion and to utilize excess nutrients.

(3) Sediment shall be retained within the development site area either by filtering runoff as it flows through the development area or by detaining sediment-laden runoff in a sediment basin so that the soil particles settle out.

(4) Water released to a drainage system shall be directed in such a manner as to travel over natural areas rather than across established surfaces.

(5) Stormwater runoff may be directed to wetlands only when free of silt, debris and chemical pollutants and only at rates which will not disturb vegetation or increase turbidity.

(6) Development which takes place near slopes greater than twelve (12) percent shall not result in increased runoff onto those slopes sufficient to damage vegetation or structures thereon.

(7) Plans shall be submitted to the planning commission for any development placed landward from dikes, floodwalls or levees which is below the flood protection elevation of the dikes, floodwalls or levees. The plans must provide measures to ensure that floodwaters do not back up onto the development from stormwater drainage systems.

(C.F. No. 03-241, § 2, 3-26-03)

ARTICLE V. 68.500. CONDITIONAL USE PERMITS

Sec. 68.501. Application.

Applications for conditional use permits shall be submitted and reviewed according to the provisions in section 64.300. The planning administrator shall determine whether to require any or all of the following six (6) items of information to be supplied by the applicant as a prerequisite to the consideration of the application:

(a) Plans in triplicate drawn to scale, prepared by and signed by a registered engineer, architect and/or land surveyor as applicable, showing the nature, location, dimensions and elevation of the land; existing surface contours, structures, streets and utilities; proposed surface contours, structures, fill and the location and elevations of proposed streets, water supply, sanitary facilities and other utilities showing the relationship of the above to the channel and to the designated River Corridor District limits.

(b) Specifications for building construction and materials, floodproofing, filling, dredging, grading, channel improvements, storage of materials, water supply and sanitary facilities.

(c) Typical valley cross-sections of areas to be occupied by the proposed development showing the channel of the stream, elevation of land areas, high water information, vegetation and soil types.

(d) Plan (surface view) of the proposed development showing the proposed use or uses of the area and structures and providing location, relationships and spatial arrangements of those uses and related structures to pertinent elevations, fill,

storage location, utilities and other features.

(e) Profile showing the slope of the bottom of the channel and flow lines of the stream.

(f) A written evaluation by a registered engineer or other expert person or agency of the proposed project in relationship to flood heights and velocities, the seriousness of flood damage to the use, the adequacy of plans for flood protection and other technical matters.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.502. Other permits.

Applicable conditional use permits for lands in the designated River Corridor District must be obtained prior to application for all other permits required by law and ordinance. Conditional use permits for River Corridor areas are supplementary to other zoning and building permits.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.503. Factors considered.

In addition to the general standards and requirements in section 61.500 and all other relevant factors specified in other sections of this chapter, in reviewing conditional use permit applications, the planning commission or planning administrator shall consider the following:

(a) The relationship of the proposed use to the comprehensive plan and floodplain management program for the city.

(b) The importance of the services provided by the proposed facility to the community.

(c) The ability of the existing topography, soils and geology to support and accommodate the proposed use.

(d) The compatibility of the proposed use with existing characteristics of biologic and other natural communities.

(e) The proposed water supply and sanitation systems and the ability of those systems to prevent disease, contamination and unsanitary conditions.

(f) The requirements of the facility for a river-dependent location, if applicable.

(g) The safety of access to the property for ordinary vehicles.

(h) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner.

(i) The dangers to life and property due to increased flood heights or velocities caused by encroachments.

(j) The expected heights, velocity, duration, rate of rise, and sediment transport of the floodwaters expected at the site.

(k) The danger that materials may be swept onto other lands or downstream to the injury of others.

(l) The availability of alternative locations or configurations for the proposed use.

(m) Such other factors as are relevant to the purposes of this chapter.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.504. Conditions imposed.

The planning commission or planning administrator may attach such conditions to the granting of conditional use permits as each deems necessary to fulfill the purposes of this chapter. Such conditions may include, but are not limited to, the following:

(a) Modifications of design, site planning or site treatment.

(b) Requirements for implementation of erosion and sediment control, vegetation management, wildlife management and other protective measures.

(c) Modifications of waste disposal and water supply facilities or operations.

(d) Limitations on period of use and operation, a flood warning system and an evacuation plan.

(e) Imposition of operational controls, sureties and deed restrictions.

(f) Requirements for construction of channel improvements, modifications, dredging, dikes, levees and other protective measures.

(g) Floodproofing measures shall be designed consistent with state-established floodproofing standards and with the flood protection elevation for the particular area including flood velocities, duration and rate of rise, hydrostatic and hydrodynamic forces, and other factors associated with the regulatory flood. The commission shall require that the applicant submit a plan or documents certified by a registered professional engineer or architect that the floodproofing measures are consistent with the regulatory flood elevation and associated flood factors for the particular area. The floodproofing measures that may be required include, but are not limited to, the following:

(1) Anchorage to resist flotation and lateral movement.

(2) Installation of watertight doors, bulkheads and shutters, or similar methods of construction.

(3) Reinforcement of walls to resist water pressure.

(4) Use of paints, membranes or mortars to reduce seepage of water through walls.

(5) Addition of mass or weight to structures to resist flotation.

(6) Installation of pumps to lower water levels in structures.

(7) Construction of water supply and waste treatment systems to prevent the entrance of floodwaters.

(8) Installation of pumping facilities or comparable practice for subsurface drainage systems for buildings to relieve external foundation wall and basement floor pressures.

(9) Construction to resist rupture or collapse caused by water pressure or floating debris.

(10) Installation of valves or controls on sanitary and storm drainage which will permit the drains to be closed to prevent backup of sewage and stormwaters into the buildings or structures. Gravity draining of basements may be eliminated by mechanical devices.

(11) Location of all electrical equipment, circuits and installed electrical appliances such that they are not subject to the regional flood.

(12) Location of any structural storage facilities for chemicals, explosives, buoyant materials, flammable liquids or other toxic materials, which could be hazardous to public health, safety and welfare, above the flood protection elevation or provision of adequate floodproofing to prevent flotation of or damage to storage containers which could result in the escape of toxic materials into floodwaters.

(h) Specifications for building construction and materials, filling and grading, water supply, sanitary facilities, utilities and other work or construction to be submitted to the city division of housing and building code enforcement for review and approval prior to any development.

(C.F. No. 03-241, § 2, 3-26-03)

ARTICLE VI. 68.600. VARIANCES

Sec. 68.601. Variances.

(a) Applications for variance to the provisions of this chapter may be filed as provided in section 61.600. The burden of proof shall rest with the applicant to demonstrate conclusively that such variance will not result in a hazard to life or property and will not adversely affect the safety, use or stability of a public way, slope or drainage channel, or the natural environment; such proof may include soils, geology and hydrology reports which shall be signed by registered professional engineers. Variances shall be consistent with the general purposes of the standards contained in this chapter and state law and the intent of applicable state and national laws and programs. Although variances may be used to modify permissible methods of flood protection, no variance shall have the effect of allowing in any district uses prohibited in that district, permit a lower degree of flood protection than the flood protection elevation for the particular area, or permit a lesser degree of flood protection than required by state law.

(b) Notwithstanding any other provision of this river corridor code, variances may be granted for the repair or rehabilitation of historic structures upon a determination that the repair or rehabilitation will not preclude the structure's continued designation as a historic structure, the variance is the minimum necessary to preserve the historic character and design of the structure and the repair or rehabilitation will not cause an increase in the height of the regional flood or increase the flood damage potential of the structure.

(C.F. No. 03-241, § 2, 3-26-03)

ARTICLE VII. 68.700. NONCONFORMING STRUCTURES

Sec. 68.701. Floodplain nonconforming structures.

Nonconforming use of structures and land and nonconforming structures shall be subject to the regulations in this section as well as provisions of chapter 62, Nonconforming Lots, Uses and Structures. A structure which was lawful before the passage or amendment of this chapter but which is not in conformity with the provisions of this chapter may be continued subject to the following conditions:

(a) No structure shall be expanded, changed, enlarged or altered in a way which increases its nonconformity.

(b) Any alteration or addition to a nonconforming structure which would result in increasing the flood damage potential of that structure or use shall be protected to the regulatory flood protection elevation in accordance with any of the elevation on fill or floodproofing techniques (i.e., FP-1 through FP-4, floodproofing classifications) allowable in the state building code, except as further restricted in subsection c. below.

(c) The cost of any structural alterations or additions to any nonconforming structure over the life of the structure shall not exceed fifty (50) percent of the market value of the structure unless the conditions of this section are satisfied. The cost of all structural alterations and additions constructed since January 28, 1982, must be calculated into today's current cost which will include all costs such as construction materials and a reasonable cost placed on all manpower or labor. If the current cost of all previous and proposed alterations and additions exceeds fifty (50) percent of the current market value of the structure, then the structure must meet the standards of Section 68.210 or 68.220 of this chapter for new structures depending upon whether the structure is in the floodway or flood fringe, respectively.

(d) When the use of a nonconforming structure is discontinued or ceases to exist for three hundred sixty-five (365) days, the nonconforming structure shall not thereafter be reused until the nonconforming is made conforming to the flood protection measures of this chapter, unless the planning commission, pursuant to a public hearing, finds that the nonconforming structure cannot reasonable or economically be made into a conforming structure and that reuse of the nonconforming structure is consistent with the public health, safety, morals and general welfare of the community and is consistent with the reasonable use and enjoyment of adjacent property.

(e) If any nonconforming structure is destroyed by any means, including floods, to an extent of fifty (50) percent or more of its market value at the time of destruction, it shall not be reconstructed except in conformity with the provisions of this chapter. The applicable provisions for establishing new structures in Section 68.210 or 68.220 will apply depending upon whether the structure is in the floodway or flood fringe, respectively.

(C.F. No. 03-241, § 2, 3-26-03)

ARTICLE VIII. 68.800. AMENDMENTS

Sec. 68.801. Amendments.

(a) All amendments shall be made in the manner set forth in Minnesota Statutes, Section 462.357. The floodplain designations established by this chapter shall not be removed from floodplain areas unless it can be shown that the designation is in error or that the areas are filled to an elevation at or above the flood protection elevation and are contiguous to other lands lying outside the floodplain district. Special exceptions to this rule may be permitted by the Commissioner of Natural Resources if he determines that, through other measure, lands are adequately protected for the intended use.

(b) All amendments to this chapter, including amendments to the River Corridor Overlay Districts maps, must be submitted to and approved by the Commissioner of Natural Resources prior to adoption. Changes to the flood plain boundaries must meet the Federal Emergency Management Agency's (FEMA) technical conditions and criteria and must receive prior FEMA approval before adoption. The Commissioner of Natural Resources must be given ten (10) days' written notice of all hearings to consider an amendment to this chapter and such notice shall include a draft of the ordinance amendment or technical study under consideration.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.802. Areas protected by dikes, levies and floodwalls.

Areas which the Federal Emergency Management Agency has removed from the floodplain through a revision to the flood insurance rate map or a letter of map revision because the areas are protected by a dike, levee or floodwall shall be exempt from the flood protection regulations of this code after said FEMA action has been adopted as a formal amendment to this chapter.

(C.F. No. 03-241, § 2, 3-26-03)

ARTICLE IX. 68.900. ADMINISTRATION

Sec. 68.901. Administration.

(a) *Record of elevation of lowest floor and floodproofing.* The zoning administrator shall maintain a record of the elevation of the lowest floor (including basement) of all new structures, altered structures or additions to existing structures in the floodplain. The zoning administrator shall also maintain a record of the elevation to which all new structures and alterations or additions to structures are floodproofed.

(b) *State and federal permits.* Applicants for special condition use permits, modifications and site plan review approval are responsible for obtaining all necessary state and federal permits.

(c) *Warning and disclaimer of liability.* This chapter does not imply that areas outside the floodplain districts or land uses permitted within such districts will be free from flooding or flood damages. This chapter shall not create liability on the part of the City of Saint Paul or any officer or employee thereof for any flood damages that result from reliance on this chapter or any administrative decision lawfully made thereunder.

(d) *Severability.* If any section, clause, provision or portion of this chapter is adjudged unconstitutional or invalid by a court of competent jurisdiction, the remainder of this chapter shall not be affected thereby.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.902. Notify commissioner of natural resources.

A copy of the application for a conditional use permit or variance shall be submitted to the commissioner of natural resources sufficiently in advance so that the commissioner will receive at least ten (10) days' notice of the hearing. A copy of all decisions granting conditional use permits or variances shall be forwarded to the commissioner of natural resources within ten (10) days of such action.

(C.F. No. 03-241, § 2, 3-26-03)

Sec. 68.903. Notice of increased insurance costs.

Applicants for a conditional use permit or variance to construct a structure below the regulatory flood protection elevation shall be notified that:

(1) The issuance of a conditional use permit or variance to construct a structure below the regulatory flood protection elevation may result in increased premium rates for flood insurance up to amounts as high as twenty-five dollars ($25.00) for one hundred dollars ($100.00) of insurance coverage; and

(2) Such construction below the regulatory flood protection elevation increases risks to life and property. Such notification shall be maintained with a record of the conditional use permit or variance. The planning or zoning administrator shall report such conditional use permits or variances issued in the biennial report submitted to the administrator of the National Flood Insurance Program.

(C.F. No. 03-241, § 2, 3-26-03)

Appendix E

Storm Water Ordinance

Council File # _____
Green Sheet # 111523

ORDINANCE
CITY OF SAINT PAUL, MINNESOTA

Presented By _____

Referred To _____ Committee Date _____

An ordinance regulating storm water runoff from construction activities

THE COUNCIL OF THE CITY OF SAINT PAUL DOES ORDAIN:

Section 1

A new Chapter 52 of the Saint Paul Legislative Code is hereby enacted:

Sec. 52.01. Purpose. The purpose of this ordinance is to control storm water pollution along with soil erosion and sedimentation in the City of Saint Paul. It establishes standards and specifications for practices and planning activities, which minimize storm water pollution, soil erosion and sedimentation.

Sec. 52.02 Scope. Any person, firm, sole proprietorship, partnership, corporation, state agency, or political subdivision proposing a construction activity of 1 acre or more within the City of Saint Paul shall submit a storm water pollution control plan to the City for approval. No land shall be disturbed until the plan, conforming to the standards set forth herein, is approved by the City.

Sec. 52.03. Definitions. For the purposes of this chapter, the terms used in this chapter have the meanings defined as follows:

(1) Applicant means any person or entity that applies for a building permit, subdivision approval, or a permit to allow construction activities. Applicant also means that person's agents, employees, and others acting under this person's direction.

(2) Best Management Practices (BMP's) mean the erosion and sediment control and water quality management practices that are the most effective and practicable means of controlling, preventing, and minimizing degradation of surface water, including avoidance of impacts, construction phasing, minimizing the length of time soil areas are exposed, prohibitions, and other management practices published by state or designated area-wide planning agencies. Individual BMPs are described in the current version of "Protecting Water Quality in Urban Areas", Minnesota Pollution Control Agency 2000. BMPs must be adapted to the site and can be adopted from other sources. However, they must be similar in purpose and as effective and stringent as the MPCA's BMPs. Other sources include the current versions of "Minnesota Small Sites Urban BMP Manual", Metropolitan Council Environmental Services 2001, and "Erosion Control Design Manual", Minnesota Department of Transportation, 1993.

(3) Construction Activity means disturbance to the land that may result in soil erosion and the movement of

sediments into surface waters, drainage systems or onto adjacent properties, including clearing, grading, filling and excavating except for disturbances resulting from the construction or maintenance of public roads and utilities.

(4) Dewatering means the removal of water for construction activity. It can be a discharge of appropriated surface or groundwater to dry and/or solidify a construction site. It may require Minnesota Department of Natural Resources permits to be appropriated and if contaminated may require other MPCA permits to be discharged.

(5) Discharge means the release, conveyance, channeling, runoff, or drainage, of storm water, including snowmelt, from a construction site.

(6) Erosion means the wearing away of the ground surface as a result of the movement of wind, water, ice, and/or construction activities.

(7) Erosion Control means methods employed to prevent erosion including, but not limited to soil stabilization practices, limited grading, mulch, temporary or permanent cover, and construction phasing.

(8) Final Stabilization means that all soil disturbing activities at the site have been completed and a uniform, evenly distributed perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

(9) Impervious Surface means a constructed hard surface that prevents or retards the entry of water into the soil. Examples include rooftops, sidewalks, patios, driveways, parking lots, storage areas, and concrete, asphalt, or gravel roads.

(10) MPCA means the Minnesota Pollution Control Agency.

(11) NPDES means the National Pollutant Discharge Elimination System, the program for issuing, modifying, and enforcing permits under the Federal Clean Water Act.

(12) Owner means the person or party possessing the title of the land on which the construction activity will occur; or if the construction activity is for a lease holder, the party or individual identified as the lease holder; or the contracting government agency responsible for the construction activity.

(13) Permanent Cover means final stabilization. Examples include grass, gravel, asphalt, and concrete.

(14) Runoff means rainfall, snowmelt, or irrigation water flowing over the ground surface.

(15) Sediment Control means the methods employed to prevent sediment from leaving the site. Sediment control practices include, but are not limited to, silt fences, sediment traps, earth dikes, drainage swales, check dams, subsurface drains, pipe slope drains, storm drain inlet protection, and temporary or permanent sedimentation basins.

(16) Stabilization means covering the exposed ground surface with appropriate materials such as mulch, staked sod, riprap, wood fiber blanket, or other material that prevents erosion from occurring. Sowing grass seed is not

considered stabilization.

(17) Standard Plates means general drawings having or showing similar characteristics or qualities that are representative of a construction practice or activity.

(18) Storm Water Runoff includes precipitation runoff, snow melt runoff, and any other surface runoff and drainage. Storm water does not include construction site dewatering.

(19) Storm Water Pollution Control Plan means a plan, prepared by the applicant, for storm water discharge that includes erosion and sediment control measures that, when implemented, will decrease soil erosion on a parcel of land and decrease off-site pollution.

(20) Surface Waters means all streams, lakes, ponds, marshes, wetlands, reservoirs, springs, rivers, drainage systems, waterways, watercourses, and irrigation systems.

*(21) T*emporary *Erosion Protection* means short term methods employed to prevent erosion. Examples of temporary cover include: straw, erosion control blankets, wood chips, and erosion netting.

(22) Wetlands as defined in Minnesota Rules 7050.0130, subpart F, "wetlands," are those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Sec. 52.04. Storm Water Pollution Control Plan. Any person, firm, sole proprietorship, partnership, corporation, state agency, or political subdivision proposing a construction activity of 1 acre or more within the City of Saint Paul shall submit a storm water pollution control plan to the City for approval. No land shall be disturbed until the plan, conforming to the standards set forth herein, is approved by the City. At a minimum these pollution abatement control practices must conform to those in the current version of the MPCA's publication, "Protecting Water Quality in Urban Areas" or other sources as defined in Section 52.03 (2).

(a) *Minimum Requirements of the Storm Water Pollution Control Plan*:

(1) The name, address and telephone number of the following individuals:
   a. Owner,
   b. Applicant,
   c. Person responsible for the preparation of the Storm Water Pollution Control Plan,
   d. On-site person responsible for implementation, inspection and maintenance of the requirements of the Storm Water Pollution Control Plan,
   e. Person responsible for the long term operation and maintenance of the permanent storm water management system.

(2) A project description that includes the nature and purpose of the construction activity, the amount of grading, utilities, and building construction involved and the location of the project.

(3) Construction phasing that includes time frames and schedules for the project's various aspects including erosion and sediment control practices.

(4) A map of the existing site conditions that includes existing topography, property information, steep slopes,

existing drainage systems/patterns, type of soils, waterways, wetlands, vegetative cover and one hundred (100) year flood plain boundaries.

(5) A site construction plan that includes the location of the proposed construction activity and the plan for the maintenance and inspection of the storm water pollution control measures, including the plan for disposal of collected sediment and floating debris.

(6) Location of temporary and permanent storm water pollution control measures.

(7) Standard plates and/or specifications for all storm water pollution control measures.

(8) Location of streams, lakes or wetlands which may be impacted by the construction activity.

(9) Provisions for preventing sediment damage to adjacent properties and other designated areas such as streams, wetlands and lakes.

(10) A plan to stabilize utility construction areas as soon as possible.

(11) A plan for permanent stabilization including how the site will be stabilized after construction is completed, including specifications and schedules.

(12) A plan for removal of temporary erosion and sediment control measures at the end of the project.

(13) Calculations that were made for the design of such items as rate control, sediment basins, wet detention basins, diversions, waterways, infiltration zones and other applicable practices.

(b) *Minimum Storm Water Pollution Control Measures*. These minimum control measures are required where bare soil is exposed. Where additional control measures are needed, they will be specified at the discretion of the City.

(1) All storm water pollution control plans must be reviewed by the City for the effectiveness of erosion control measures in the context of site topography and drainage.

(2) Sediment control measures must be properly installed by the builder before the construction activity begins. Such structures may be adjusted during dry weather to accommodate short term activities, such as those that require the passage of very large vehicles. As soon as this activity is finished or before rainfall, the erosion and sediment control structures must be returned to the original configuration.

(3) Divert channeled runoff around disturbed areas and protect the channel.

(4) If a storm water management plan involves directing some or all of the site's runoff to adjacent property, the applicant or his designated representative shall obtain from adjacent property owners any necessary easements or other property interests concerning the flowing of such water.

(5) Scheduling the site's activities to lessen their impact on erosion and sediment creation, so as to minimize the amount of exposed soil.

(6) Control storm water runoff as follows:

a. All exposed soil areas with a continuous positive slope within 200 lineal feet of a surface water, must have temporary erosion protection or permanent cover for the exposed soil areas, according to the following table of slopes and time frames:

Type of Slope	Time*
Steeper than 3:1	7 days
10:1 to 3:1	14 days
Flatter than 10:1	21 days

* Maximum time an area can remain open when the area is not actively being worked.

These areas include pond side slopes, and any exposed soil areas with a positive slope to a storm water conveyance system, such as a curb and gutter system, storm sewer inlet, temporary or permanent drainage ditch or other natural or man made systems that discharge to a surface water.

b. Install erosion and sediment controls at locations specified in the storm water management plan. Minimum requirements include silt fences, rock check dams, or other equivalent control measures along slopes. Silt fences are required along channel edges to reduce sediment reaching channel. Silt fences, rock check dams, etc. must be regularly inspected and maintained.

c. The work shall conform to the current version of the MPCA's publication, "Protecting Water Quality in Urban Areas," and the current requirements found in the same agency's NPDES/SDS permits for storm water associated with construction activities.

(7) Silt fence shall be required to hold all sheet flow runoff generated at an individual site, until it can either infiltrate or seep through silt fence's pores.

(8) Temporary soil stockpiles must have silt fence or other effective sediment controls, and cannot be placed in surface waters, including storm water conveyances such as curb and gutter systems, or conduits and ditches.

(9) Temporary rock construction entrances are required wherever vehicles enter and exit a site.

(10) Streets must be cleaned and swept whenever tracking of sediments occurs and before sites are left idle for weekends and holidays. A regular sweeping schedule shall be established.

(11) Water (impacted by the construction activity) removed from the site by pumping must be treated by temporary sedimentation basins, geotextile filters, grit chambers, sand filters, up-flow chambers, hydro-cyclones, swirl concentrators or other appropriate controls. Such water shall not be discharged in a manner that causes erosion or flooding of the site, receiving channels, adjacent property or a wetland.

(12) All storm drain inlets must be protected during construction until control measures are in place with either silt fence or an equivalent.

(c) *Storm Water Runoff Rate Control* Storm water runoff rate control is required for sites larger than one quarter of an acre which go through the City's Site Plan Review process. Storm water discharge into public storm sewers shall be controlled, in accordance with the Department of Public Works Policy. Required information to be submitted as part of the Storm Water Pollution Control Plan is available in a handout from the Department of Public Works. Peak storm water discharge rates from the site for all storms up to and including

the critical 100-year frequency will not exceed:

$Q = 1.64 \times A$

where Q = the maximum acceptable discharge rate in cubic feet per second and A = the site area in acres.

Discharge of all storm water runoff and surface water shall be in a fashion so as to preclude drainage onto adjacent property or toward buildings.

(d) *Flood Control for Buildings* The low floor elevation for new construction must be a minimum of 1 foot above the critical 100-yr flood elevation and at least 4 feet above normal groundwater elevation.

(e) *Temporary Sediment Basins* For common drainage locations that serve an area with 10 or more acres disturbed at one time, a temporary (or permanent) sediment basin must be provided prior to the runoff leaving the construction site or entering surface waters. In addition to this requirement, the applicant is encouraged to install temporary sediment basins where appropriate in areas with steep slopes or highly erodible soils even if less than 10 acres drains to one area. The basins must be designed and constructed in accordance with the current version of the MPCA's General Permit to Discharge Storm Water Associated with Construction Activity under the NPDES.

(f) *Permanent Storm Water Pollution Controls*

(1) Where a project's ultimate development replaces vegetation and/or other pervious surfaces with 1 or more acres of cumulative impervious surface, a water quality volume of ½ inch of runoff from the new impervious surfaces created by the project must be treated in one of the following ways prior to the runoff leaving the site or entering surface waters (excluding drainage systems that convey storm water to a constructed permanent storm water management facility designed to treat the water quality volume from the project.): wet sedimentation basin, infiltration/filtration, regional ponds, a combination of practices, or alternate methods in accordance with the current version of the MPCA's General Permit to Discharge Storm Water Associated with Construction Activity under the NPDES.

(2) At a minimum these facilities must conform to the most current technology as reflected in the current version of the MPCA's publication "Protecting Water Quality in Urban Areas" or other sources as defined in Section 52.03 and the current requirements found in the same agency's NPDES permits for storm water associated with construction activities.

(3) Permanent storm water pollution controls to be designed by a professional engineer licensed in the State of Minnesota. Constructed controls must be certified by a professional engineer as required in Section 52.04(g)(3).

(g) *Models/Methodologies/Computations* Hydrologic models and design methodologies used for the determining runoff characteristics and analyzing storm water management structures must be approved by the City. Plans, specifications and computations for storm water management facilities submitted for review must be sealed and signed by a licensed professional engineer. All computations must appear in the plans submitted for review, unless otherwise approved by the City.

(h) *Inspection and Maintenance of the Storm Water Pollution Control Plan's Measures*

(1) The applicant must routinely inspect the construction site once every 7 days during active construction and within 24 hours after a storm event greater than 0.25 inches in 24 hours.

(2) The City's inspection staff is authorized to perform inspection and enforce provisions of this ordinance as may be required , to ensure that erosion and sediment control measures are properly installed and maintained. If the applicant fails to maintain proper erosion control measures on site and/or perform necessary remedial action, as directed by the inspector, the inspector may take such enforcement action as may be required to achieve compliance. Enforcement may be, but is not limited to, stopping all construction work at the site, until necessary remedial actions have been completed and erosion and sediment controls are in compliance with the approved plans.

(3) For sites that require permanent storm water pollution controls, a certification letter shall be submitted after the facilities have been installed to affirm that construction has been completed in accordance with the approved Storm Water Pollution Control Plan. At a minimum, certification shall include a set of as-built drawings comparing the approved storm water management plan with what was constructed. Other information shall be submitted as required by the approving agency.

(4) It shall be the responsibility of the applicant to obtain any necessary easements or other property interests to allow access to the storm water management facilities for inspection and maintenance purposes.

(5) All storm water pollution control management facilities must be designed to minimize the need of maintenance, to provide easy vehicle and personnel access for maintenance purposes and be structurally sound. These facilities must have a plan of operation and maintenance that ensures continued effective removal of the pollutants carried in storm water runoff.

Sec. 52.05. Review. The City shall review the storm water pollution control plan pursuant to the provisions of Minnesota Statute Sec. 15.99.

Sec. 52.06. Modification of Plan An approved storm water pollution control plan may be modified upon submission of a written application for modification to the City, and after written approval by the City. In reviewing such an application, the City may require additional reports and data.

Sec. 52.07. Financial Securities The City may require financial security, in the form of either bond, letter of credit or cash escrow, for the performance of the work described in the approved storm water pollution control plan and any related remedial work. This security must be available prior to commencing the project.

(a) Action Against the Financial Security The City may act against the financial security if any of the conditions listed below exist. The City shall use funds from this security to finance any corrective or remedial work undertaken by the City or a contractor under contract to the City and to reimburse the City for all direct cost incurred in the process of remedial work including, but not limited to, staff time and attorneys' fees.

(1) The applicant ceases construction activities and/or filling and abandons the work site prior to completion of the storm water pollution control plan.
(2) The applicant fails to conform to the storm water pollution control plan as approved by the City, or to related supplementary instructions.
(3) The techniques utilized under the storm water pollution control plan fail within one year of installation.
(4) The applicant fails to reimburse the City for corrective action taken under Section 52.08.
(5) Emergency action is taken under Section 52.08.

(b) Returning the Financial Security Any unspent amount of the financial security deposited with the City for

faithful performance of the storm water pollution control plan and any storm water and pollution control plan related remedial work must be released not more than one full year after the completion of the installation of all such measures and the establishment of final stabilization.

Sec. 52.08. Failure of the Storm Water Pollution Control Plan

(a) *Notification by the City* The City shall notify the applicant, when the City has determined that any of the conditions set forth in 52.07(a) exist. The initial contact will be to the party or parties listed on the storm water pollution control plan as contacts. Except during an emergency action, the City at its discretion may begin corrective work forty-eight (48) hours after notification by the City . Such notification should be in writing, but if it is verbal, a written notification should follow as quickly as practical. If after making a good faith effort to notify the responsible party or parties, the City has been unable to establish contact, the City may proceed with corrective work.

(b) *Emergency Action* If circumstances exist that pose an immediate danger to the public health, safety and welfare, the City, upon making this determination, may take immediate action to abate said circumstances for the purpose of restoring the site to a safe condition. The City shall, as part of this action, make reasonable effort to contact and give notice to the applicant of the decision to institute this emergency procedure. Any cost to the City associated with this emergency action is recoverable from the applicant or the applicant's financial security.

(c) *Erosion Off-Site* If erosion breaches the perimeter of the site, the applicant shall immediately develop a cleanup and restoration plan, obtain the right-of-entry from the adjoining property owner, and implement the cleanup and restoration plan within forty-eight (48) hours of obtaining the adjoining property owner's permission. In no case, unless written approval is received from the City, shall more than seven (7) calendar days go by without corrective action being taken. If, in the discretion of the City, the applicant does not repair the damage caused by the erosion, the City may do the remedial work required and charge the cost to the applicant.

(d) *Erosion into Streets, Right-of-ways, Wetlands or Water Bodies* If eroded soils (including tracked soils from construction activities) enter or appear likely to enter streets, right-of-ways, wetlands, or other water bodies, prevention strategies, cleanup and repair must be immediate. The applicant shall provide all traffic control and flagging required to protect the traveling public during the cleanup operations and secure required right-of-way permits from the Department of Public Works.

(e) *Failure to Do Corrective Work* When an applicant fails to conform to any provision of Sections 52.07 or 52.08 within the time stipulated, the City may take the following actions:

(1) Withhold the scheduling of inspections and/or the issuance of a Certificate of Occupancy.

(2) Revoke any permit issued by the City to the applicant for the site in question.

(3) Direct the correction of the deficiency by City forces or by a separate contract.

(4) All costs incurred by the City in correcting storm water pollution control deficiencies must be reimbursed by the applicant. If payment is not made within thirty (30) days after costs are incurred by the City, payment will be made from the applicant's financial securities as described in Section 52.07.

(5) If a financial security as described in Section 52.07 was not required by the City, or if there is an insufficient financial amount in the applicant's financial securities to cover the costs incurred by the City, then the City in its

discretion is authorized to either certify the remaining amount to the property taxes or to assess the remaining amount against the property.

Sec. 52.09. Enforcement The City shall be responsible for enforcing this ordinance. Any person, firm, or corporation failing to comply with or violating any of these regulations, shall be deemed guilty of a misdemeanor and be subject to a fine or imprisonment or both. All land use and building permits must be suspended until the applicant has corrected the violation. Each day that a separate violation exists shall constitute a separate offense.

Sec. 52.10. Right of Entry and Inspection The applicant shall allow the City and their authorized representatives, upon presentation of credentials to:

(a) Enter upon the permitted site for the purpose of obtaining information, examining records, conducting investigations or surveys or for the purpose of correcting deficiencies in storm water pollution control.
(b) Bring such equipment upon the permitted site as is necessary.
(c) Examine and copy any books, papers, records, or memoranda pertaining to activities or records required to be kept under the terms and conditions of this permitted site.
(d) Inspect the storm water pollution control measures.
(e) Sample and monitor any items or activities pertaining to storm water pollution control measures.

Sec. 52.11. Record Retention The Storm Water Pollution Control Plan and all changes to it must be kept at the site during construction. The applicant must keep the Storm Water Pollution Control Plan, along with the following additional records, on file for 3 years after completion of the construction project:

(a) Any other permits required for the project;
(b) Records of all inspections and maintenance conducted during construction;
(c) All permanent operation and maintenance agreements that have been implemented, including all right-of-way, contracts, covenants and other binding requirements regarding perpetual maintenance and;
(d) All required calculations for design of the temporary and permanent storm water management systems.

Sec. 52.12. Abrogation and Greater Restrictions This ordinance is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this ordinance imposes greater restrictions, the provisions of this ordinance shall prevail.

Sec. 52.13. Other Statues, Rules and Ordinances The applicant shall comply with all federal and state statutes and local ordinances including the current version of the MPCA's General Permit to Discharge Storm Water Associated with Construction Activity under the NPDES and the requirements of the applicable Watershed District or Watershed Management Organization.

Sec. 52.14. Severability The provisions of this ordinance are severable, and if any provisions of this ordinance, or application of any provisions of this ordinance to any circumstance, are held invalid, the application of such provisions to other circumstances and the remainder of this ordinance shall not be affected.

Section 2

This ordinance is effective thirty (30) days following its passage, approval and publication.

	Yeas	Nays	Absent
Benanav			
Bostrom			
Harris			
Helgen			
Lantry			
Montgomery			
Thune			

Adopted by Council: Date _____

Adoption Certified by Council Secretary

By: _____

Approved by Mayor: Date _____

By: _____

Requested by Departments of: Public Works and License, Inspections & Environmental Protection

By: _____
Public Works

By: _____
License, Inspections & Environmental Protection

Form Approved by City Attorney

By: _____

Approved by Mayor for Submission to Council

By: _____

Appendix F

Zoning Code – Administration and Enforcement

Building Code and Inspection – Erosion Control Requirements

Chapter 61. Zoning Code--Administration and Enforcement

- Sec. 61.101. Building permits.
- Sec. 61.102. Certificate of occupancy.
- Sec. 61.103. Final inspection.
- Sec. 61.104. Permits issued, documents to be recorded.
- Sec. 61.105. Period of decision.
- Sec. 61.106. Similar use determination.
- Sec. 61.107. Conditions of approval.
- Sec. 61.108. Conditions violated, permit revocation.
- Sec. 61.201. Zoning administrator.
- Sec. 61.202. Planning commission and planning administrator.
- Sec. 61.203. Board of zoning appeals.
- Sec. 61.301. Application.
- Sec. 61.302. Application forms and fees.
- Sec. 61.303. Review procedures, hearing and notices required.
- Sec. 61.401. Site plan.
- Sec. 61.402. Site plan review (all districts).
- Sec. 61.501. Conditional use permit, general standards.
- Sec. 61.502. Modify special conditions.
- Sec. 61.503. Conditional use permit, change requiring new permit.
- Sec. 61.504. Change to conditional use, no new permit required.
- Sec. 61.601. Variances.
- Sec. 61.701. Administrative appeals.
- Sec. 61.702. Appeals to city council.
- Sec. 61.703. Permits suspended upon appeal.
- Sec. 61.704. Orders.
- Sec. 61.801. Changes and amendments.
- Sec. 61.802. Amendment limitations.
- Sec. 61.803. Amendment's effect on pending uses and structures.
- Sec. 61.901. Violations.
- Sec. 61.902. Public nuisance.
- Sec. 61.903. Fines, imprisonment.
- Sec. 61.904. Each day a separate offense.
- Sec. 61.905. Rights and remedies are cumulative.

ARTICLE I. 61.100. GENERAL PROVISIONS

Sec. 61.101. Building permits.

No building permit shall be issued for the erection, alteration, moving or use of any building or structure or part thereof, or for the use of any land, which erection, alteration, moving or use is not in accordance with all provisions of this code. No

renewal of an expired building permit shall be issued for a use or structure made nonconforming by amendments to this code.

Sec. 61.102. Certificate of occupancy.

Certificates of occupancy as required by the Saint Paul Legislative Code shall also constitute certification of zoning compliance as required by this zoning code.

Sec. 61.103. Final inspection.

The holder of every building permit for the construction, erection, alteration, repair or moving of any building, structure or part thereof shall notify the zoning administrator immediately upon the completion of the work authorized by such permit, for a final inspection.

Sec. 61.104. Permits issued, documents to be recorded.

Upon approval of a site plan, permit, variance, or other zoning approval by the zoning or planning administrator, planning commission, board of zoning appeals or city council, the applicant shall be issued a permit, or a letter of approval in the case of a site plan, upon which all conditions or limitations imposed shall be recorded. A certified copy of every conditional use permit modification granted by the planning commission or variance granted shall be filed with the county recorder or registrar of titles but shall not constitute an encumbrance on real property. All permits, modifications and variances shall include the legal description of the property involved.

Sec. 61.105. Period of decision.

No decision of the zoning or planning administrator, planning commission, board of zoning appeals or city council approving a site plan, permit, variance, or other zoning approval shall be valid for a period longer than two (2) years, unless a building permit is obtained within such period and the erection or alteration of a building is proceeding under the terms of the decision, or the use is established within such period by actual operation pursuant to the applicable conditions and requirements of the approval, unless the zoning or planning administrator grants an extension not to exceed one (1) year.

Sec. 61.106. Similar use determination.

When a specific use is not listed in the zoning code, the zoning administrator shall issue a statement of clarification, finding that the use is or is not substantially similar in character and impact to a use regulated herein. Such statement of clarification shall include the findings that led to such conclusion and shall be filed in the office of the zoning administrator. If the zoning administrator finds that the use is not sufficiently similar to any other use specifically listed and regulated in the zoning code, any person proposing such use may file an application for the planning commission to determine if a use is or is not similar to other uses permitted in each district. The zoning administrator or planning commission shall make the following findings in determining one (1) use is similar to another:

(a) That the use is similar in character to one (1) or more of the principal uses permitted.

(b) That the traffic generated on such use is similar to one (1) or more of the principal uses permitted.

(c) That the use is not first permitted in a less restrictive zoning district.

(d) That the use is consistent with the comprehensive plan.

Sec. 61.107. Conditions of approval.

The planning commission, planning or zoning administrator, board of zoning appeals, or city council may impose such reasonable conditions and limitations in granting approval of a site plan, permit, variance or other zoning approval, and in making a similar use determination, as are determined to be necessary to fulfill the spirit and purpose of the zoning code, to ensure compliance, and to protect adjacent properties.

Sec. 61.108. Conditions violated, permit revocation.

The zoning administrator shall notify the planning commission when a development covered by a permit or other matter is not in compliance with any of the conditions imposed upon such use permit. The commission may, at a public hearing, following notice to the owner of subject property and other adjacent property owners as specified in section 61.303(c), and upon determination that the conditions imposed by such approval are not being complied with, revoke the authorization for such approval and require that such use be discontinued. The commission, in lieu of revoking the permission, may impose additional conditions, modify existing conditions, or delete conditions which are deemed by the commission to be unnecessary, unreasonable or impossible of compliance.

ARTICLE II. 61.200. DECISION MAKING BODIES AND OFFICIALS

Sec. 61.201. Zoning administrator.

(a) The building official of the office of license, inspections and environmental protection shall enforce this code and is hereby designated the zoning administrator.

(b) The zoning administrator shall enforce the provisions of this zoning code and any amendment thereto and shall have the power to certify zoning compliance and to make inspections of buildings or premises necessary to enforce this code. It shall be unlawful for the zoning administrator to approve any site plans, as required in article IV, site plan review, of this chapter, or issue any permits for any excavation or construction until such plans have been inspected in detail and found to conform with this code.

(c) The zoning administrator shall determine whether lots, structures, or uses are legally nonconforming by consulting building records, city directories and other pertinent evidence for the purpose of carrying out the provisions of chapter 62.

(d) The zoning administrator shall have no authority to change or to grant variances from the terms of this code in carrying out the duties of zoning administrator.

(e) Upon proper application, and a finding of compliance with the terms of this code by the zoning administrator, the zoning

administrator shall issue the permit applied for.

Sec. 61.202. Planning commission and planning administrator.

(a) *Planning commission review.* The planning commission shall review and approve or deny site plans, conditional use permits, nonconforming use permits, similar use determinations, and other matters provided for in this code.

(b) *Grant variances.* The planning commission may act as the board of zoning appeals and grant variances from the regulations of the code related to permits, similar use determination, rezoning, or site plan approval when considered by the planning commission at the same public hearing. The commission shall grant the variances in accordance with section 61.601.

(c) *Delegation to administrator.* The planning commission may, by rule, delegate to the planning or zoning administrator its power to review and approve or deny site plans, permits or other matters, except that the planning commission shall not delegate its power to grant variances and modify special conditions.

Sec. 61.203. Board of zoning appeals.

(a) *Creation and membership.* There is hereby established a board of zoning appeals, which shall perform its duties and exercise its powers as provided by law in such a way that the objectives of this zoning code shall be observed, public safety secured, and substantial justice done. The board shall consist of seven (7) regular members and two (2) alternate members appointed by the mayor with the consent of the council. Of the regular members, one (1) member so appointed shall be a member of the planning commission with appointment coinciding with planning commission term. The appointments of the remaining six (6) of the members shall be for the following period: two (2) members for one (1) year, two (2) members for two (2) years, two (2) members for three (3) years. Following the original appointments, each member shall be appointed to hold office for the full three-year term. The regular members of the board of zoning appeals shall annually elect its own chairman, vice-chairman and secretary. Alternate members shall serve a term of three (3) years and may vote on matters before the board only in the absence of a regular member(s). The compensation of the appointed members of the board of zoning appeals shall be fixed by the council by resolution.

All members of the board of zoning appeals shall be qualified electors of the city and no member shall be an official or employee of the city.

(b) *Meetings.* All meetings of the board of zoning appeals shall be held at the call of the chairperson and at such times as such board may determine. All meetings conducted by the board shall be subject to all applicable open meeting laws and ordinances. The secretary, or his representatives, shall keep minutes of its proceedings showing the vote of each member upon each question, or if absent or failing to vote, indicating such fact, and shall also keep records of its hearings and other official action. Four (4) members of the board shall constitute a quorum for the conduct of its business; provided, that no action may be taken unless at least four (4) members vote in favor of such action. The board shall have the power to administer oaths and, upon order of the district court, to issue subpoenas, require the attendance of witnesses, compel testimony and the production of books, papers, files and other evidence pertinent to the matters before it.

(c) *Decisions by the board of zoning appeals.*

(1) The board of zoning appeals shall conduct a hearing on an appeal or variance application and shall render a decision on the appeal or application without unreasonable delay. Decisions of the board of zoning appeals shall be final subject to later appeal to the city council.

(2) Any person may appear and testify at the hearing, either in person or by duly authorized agent or attorney.

(3) All of the papers constituting the record upon which the application or the decision appealed from was taken, including, but not limited to, the action of the board of zoning appeals and the findings of fact, shall be retained in the permanent files of the office of license, inspection and environmental protection.

(4) After reaching a decision in accordance with this section, the board of zoning appeals shall prepare a written report, including, but not limited to, findings of fact and the action of the board, which report will be filed with the office of license, inspection and environmental protection without undue delay.

(5) A copy of administrative appeals concerning the river corridor districts shall be submitted to the commissioner of natural resources sufficiently in advance so that the commissioner will receive at least ten (10) days' notice of the board's hearing. A copy of all decisions granting administrative appeals shall be forwarded to the commissioner of natural resources within ten (10) days of such action.

ARTICLE III. 61.300. GENERAL APPLICATION AND REVIEW PROCEDURES

Sec. 61.301. Application.

(a) *Application to planning commission.* Any person having an ownership or leasehold interest in the subject land and/or building (contingent included) is eligible to file an application with the planning commission for site plan approval, conditional use permit, nonconforming use permit, determination of similar use, and other matters provided for in this code. Such application shall be filed with a site plan meeting the requirements of article IV, site plan review, of this chapter, and other information as required to support the application.

(b) *Application for variance.* An application for variance may be filed by any person having an ownership or leasehold interest in the subject land and/or building (contingent included). Such application shall be filed with the zoning administrator, or with the planning commission as provided in section 61.202(b), along with a site plan meeting the requirements of article IV, site plan review, of this chapter, and other information as required to support the application.

(c) *Appeals.* Appeals to the board of zoning appeals or of board of zoning appeals decisions shall be filed with the zoning administrator. Appeals to the planning commission or of planning commission decisions shall be filed with the planning administrator.

(d) *Rezoning.* Applications for rezoning by the owners of sixty-seven (67) percent of the area of the property to be rezoned

shall be filed with the planning administrator along with supporting documents required by section 61.801 and/or by state statutes.

Sec. 61.302. Application forms and fees.

(a) *Application forms and fee.* All applications shall be filed on appropriate forms. Pursuant to Minn. Stat. § 462.353, subd. 4, a fee to defray the costs incurred in administering official zoning controls established pursuant to Minn. Stat. § 462.351-364, as set forth in the schedule below, shall be paid by the applicant when a zoning application is filed. The fee for applications filed with the planning administrator shall be paid to the department of planning and economic development. The fee for applications filed with the zoning administrator shall be paid to the office of license, inspections and environmental protection. Zoning control application fees may be amended from time to time by ordinance.

(b) *Fee schedule; amendment of fees.* Fees for the following zoning control applications shall be as set forth in the schedule below. Zoning control application fees may be amended from time to time by ordinance. A copy of the fee schedule shall at all times be maintained in the office of the city clerk and displayed in the office of license, inspections and environmental protection and the department of planning and economic development.

(1) *Site plan review:*

a. Ninety dollars ($90.00) residential, one (1) to four (4) dwelling units.

b. Three hundred fifty dollars ($350.00) up to twenty-five thousand (25,000) square feet of land and seventy dollars ($70.00) for each additional twenty-five thousand (25,000) square feet of land for all uses.

(2) *Conditional use permit:* Seven hundred forty dollars ($740.00) up to twenty-five thousand (25,000) square feet of land and one hundred seventy-five dollars ($175.00) for each additional twenty-five thousand (25,000) square feet of land.

(3) *Major variance:*

a. Three hundred fifty dollars ($350.00) one-family or two-family residential.

b. Four hundred seventy dollars ($470.00) multiple-family residential.

c. Six hundred eighty dollars ($680.00) commercial, industrial, institutional.

(4) *Minor variance:* Two hundred eighty dollars ($280.00).

(5) *Sign variance:* Three hundred fifty dollars ($350.00).

(6) *Nonconforming use permit, determination of similar use:* Six hundred fifteen dollars ($615.00).

(7) *Appeals:* Four hundred fifteen dollars ($415.00) for appeals from administrative decisions to the board of zoning appeals or planning commission and from decisions of the board of zoning appeals or planning commission to the city council.

(8) *Rezoning:* One thousand dollars ($1,000.00) up to twenty-five thousand (25,000) square feet of land, and two hundred fifty dollars ($250.00) for each additional twenty-five thousand (25,000) square feet of land.

(9) *Multiple approvals:* For any permit or variance application in subparagraph (2) through (7) above submitted for consideration by the planning commission at the same public hearing as a rezoning, or a permit or variance application in subparagraph (2) through (7) with a higher fee, an additional fee of two hundred forty-five ($245.00) shall be added to the rezoning fee set forth in subparagraph (8) or to the higher fee in subparagraph (2) through (7).

(10) *Subdivision review:*

a. One hundred fifteen dollars ($115.00) lot split.

b. Four hundred seventy dollars ($470.00) up to one (1) acre of land, and one hundred fifteen dollars ($115.00) for each additional acre of land, sans dedicated public streets and open space, for preliminary plat/registered land survey.

c. One hundred seventy-five dollars ($175.00) final plat/registered land survey.

(11) *Shared parking permit:* Three hundred fifty dollars ($350.00).

(12) *Zoning compliance letter, research:*

a. Fifty dollars ($50.00) one- and two-family residential.

b. Eighty dollars ($80.00) all other uses.

(13) *Wetland Conservation Act administrative determination:*

a. One hundred dollars ($100.00) Wetland Conservation Act compliance letter.

b. Two hundred fifty dollars ($250.00) coordination of wetland fill and replacement request.

(14) *Zoning petition:* Two dollars ($2.00) each parcel for ownership list.

(15) *Late fee:* For any application made for any development commenced without first obtaining all required permits and approvals, the fees listed above shall be doubled, to a maximum additional fee of three hundred forty-five dollars ($345.00), to offset costs associated with investigating, processing and reviewing applications for such development.

(16) *Refunds:* For a zoning case withdrawn before final approval, the zoning or planning administrator may refund part of the fee based upon the proportion of the work completed at the time of withdrawal.

(17) *Large sites:* For large sites where only a portion of the site is affected by the zoning action, the zoning or planning administrator may set the fee based on the size of the affected portion of the site.

(c) *Fee for permits and approvals subject to annual review condition.* A holder of a conditional use permit, nonconforming use permit or variance, which the planning commission, board of zoning appeals or city council, has approved subject to annual review, shall pay to the office of license, inspections and environmental protection, at the time the zoning

administrator provides notice of the annual review to the permit holder, an annual review fee in the sum of fifty dollars ($50.00).

(C.F. No. 04-537, § 1, 6-9-04)

Sec. 61.303. Review procedures, hearing and notices required.

The planning commission (when authority has not been delegated to the planning or zoning administrator), the board of zoning appeals, and the city council upon appeal shall make no decision on a specific zoning application until after a public hearing has been conducted by the planning commission or zoning committee of the planning commission, board of zoning appeals, or city council. Notice of the time and place of any hearing shall be sent to the following: for minor variance cases, all owners of record of property within one hundred (100) feet of the premises in question; for all other cases, all owners of record of property within three hundred fifty (350) feet of the premises in question. Such notices shall be delivered personally or by mail addressed to the respective owners at the address given in the most current Ramsey County property taxation records.

ARTICLE IV. 61.400. SITE PLAN REVIEW

Sec. 61.401. Site plan.

All applications for building permits for all new buildings or building expansions shall be accompanied by a site plan, drawn to scale and specifications, showing the following:

(1) The actual shape, location and dimensions of the zoning lot.

(2) The shape, size and location of all buildings or other structures to be erected, altered, or moved and of any building or other structures already on the zoning lot.

(3) The existing and intended use of the zoning lot and of all such structures upon it, including, in residential areas, the number of dwelling units the building is intended to accommodate.

(4) Such other information concerning the zoning lot or adjoining lots as may be determined by the zoning administrator as essential for determining whether the provisions of this code are being observed.

Sec. 61.402. Site plan review (all districts).

(a) *Plan to be submitted.* A site plan shall be submitted to and approved by the planning commission before a permit is issued for grading or the erection or enlargement of gross floor area for any development except one- and two-family dwellings, but including the following:

(1) Any development of one- and two-family residences which together exceed two (2) acres (87,120 square feet) in area.

(2) In the TP tree preservation district, any development of one- and two-family residences over one (1) acre (43,560 square feet) in area.

(3) All residentially related uses in one-family districts, such as, but not limited to, churches, schools and public facilities.

(4) Any development in a TN district.

(5) Any industrial use in an IR, I1, I2, or I3 district abutting a residential district.

(6) Outdoor storage in industrial districts.

(7) Any use which abuts to a major thoroughfare.

(8) Any development on a slope of twelve (12) percent or greater.

(9) Any development in the river corridor critical area or in the floodplain district except one- and two-family dwellings which do not affect slopes of twelve (12) percent or greater.

(10) All off-street parking facilities except as noted in section 63.202.

(11) Any other use or development for which site plan review is required by any provision of this code.

(12) Earth-sheltered structures.

(13) Detached, freestanding facilities constructed on parking facilities, including, but not limited to, kiosks, fotomats, banks and similar uses.

(14) Any filling, excavation or tree removal that disturbs an area greater than ten thousand (10,000) square feet except the construction, installation or maintenance of public roads and public and private utilities.

(15) Cellular telephone antennas that require a new equipment building.

(b) *Site plan application:*

(1) Applications for site plan approval shall be made to the planning commission in such form as the commission may prescribe in its rules.

(2) Said rules may provide for a delegation of authority to the zoning administrator of the city of all powers and duties granted to the planning commission under this section, and such rules will be filed with the office of the city clerk.

(3) Application for site plan approval shall include nine (9) sets of plans with sufficient detail to demonstrate that the plan complies with the provisions of this code.

(4) For parking facilities, the city traffic engineer or zoning administrator may require submission of a traffic impact analysis as part of the site plan application. Such an analysis shall include, but not be limited to, the following elements: trip generation, directional distribution, traffic assignment and capacity analysis.

(5) Alley access; notice. Where a site plan application review has been delegated to the zoning administrator and notification

to adjacent property owners is required in section 63.310(f), a notice shall be sent at least ten (10) days prior to a site plan review meeting by city staff to the applicant and owners of record of property located within three hundred fifty (350) feet of the proposed alley access. Notice shall be delivered either personally or by mail at the address of the owner contained in the records of the county department of property taxation.

(c) *Site plan review and approval.* In order to approve the site plan, the planning commission shall consider and find that the site plan is consistent with:

(1) The city's adopted comprehensive plan and development or project plans for sub-areas of the city.

(2) Applicable ordinances of the city.

(3) Preservation of unique geologic, geographic or historically significant characteristics of the city and environmentally sensitive areas.

(4) Protection of adjacent and neighboring properties through reasonable provision for such matters as surface water drainage, sound and sight buffers, preservation of views, light and air, and those aspects of design which may have substantial effects on neighboring land uses.

(5) The arrangement of buildings, uses and facilities of the proposed development in order to assure abutting property and/or its occupants will not be unreasonably affected.

(6) Creation of energy-conserving design through landscaping and location, orientation and elevation of structures.

(7) Safety and convenience of both vehicular and pedestrian traffic both within the site and in relation to access streets, including traffic circulation features, the locations and design of entrances and exits and parking areas within the site.

(8) The satisfactory availability and capacity of storm and sanitary sewers, including solutions to any drainage problems in the area of the development.

(9) Sufficient landscaping, fences, walls and parking necessary to meet the above objectives.

(10) Site accessibility in accordance with the provisions of the Americans with Disabilities Act (ADA), including parking spaces, passenger loading zones and accessible routes.

(11) Provision for erosion and sediment control as specified in the "Ramsey Erosion and Sediment Control Handbook."

(d) *Compliance and time requirements.* The planning commission may make such requirements with respect to the above matters as to assure compliance with them. When changes are required, the revised site plan shall be submitted within six (6) months from the date the applicant was notified of required changes. The zoning administrator may grant extensions. The property must be brought into compliance with the approved site plan within one year of the date of approval or as otherwise specified by the zoning administrator.

(e) *Security agreement.* Before the site plan is approved, the applicant shall file a performance bond equal to the estimated cost, as determined by the zoning administrator, to install required landscaping, paving, screening, erosion and sediment control or items required by special condition. Such performance bond shall be secured and filed with the zoning administrator within three (3) months from the date the applicant was notified of the intent to approve the site plan. The zoning administrator may grant an extension.

Upon completion of the bonded work items, the owner shall apply to the zoning administrator for final inspection. If the zoning administrator finds that all installations meet the requirements of approved plans and specifications, the security agreement shall be released. However, a security agreement for landscaping shall be effective and held for one (1) year after completion of the work in order to ensure that such landscaping will survive. If improvements are not completed as proposed within the established time limit, the city may proceed to require performance by the surety, or complete such installation by contract or force account and seek reimbursement of its costs from the security agreement.

The zoning administrator shall have the right to accept a cash escrow or irrevocable letter of credit in lieu of a bond in an amount and under such circumstances as the zoning administrator shall determine appropriate.

If seasonal weather conditions or phasing of construction present practical difficulties in the installation or completion of landscaping, paving, screening or any required item, the completion may be delayed for not more than six (6) months by the zoning administrator. The extension of time shall be granted in writing.

(f) *Certificate of occupancy.* Certificate of occupancy shall not be issued until all items required for site plan approval are completed or an agreement has been made under paragraph (e) above. When a site plan is required by this code, a certificate of occupancy shall be renewed only if the use is in conformance with that site plan and all conditions of this code.

ARTICLE V. 61.500. CONDITIONAL USE PERMITS

Sec. 61.501. Conditional use permit, general standards.

Before the planning commission may grant approval of a conditional use, the commission shall find that:

(a) The extent, location and intensity of the use will be in substantial compliance with the Saint Paul Comprehensive Plan and any applicable subarea plans which were approved by the city council.

(b) The use will provide adequate ingress and egress to minimize traffic congestion in the public streets.

(c) The use will not be detrimental to the existing character of the development in the immediate neighborhood or endanger the public health, safety and general welfare.

(d) The use will not impede the normal and orderly development and improvement of the surrounding property for uses permitted in the district.

(e) The use shall, in all other respects, conform to the applicable regulations of the district in which it is located.

Sec. 61.502. Modify special conditions.

The planning commission, after public hearing, may modify any or all special conditions, when strict application of such special conditions would unreasonably limit or prevent otherwise lawful use of a piece of property or an existing structure and would result in exceptional undue hardship to the owner of such property or structure; provided, that such modification will not impair the intent and purpose of such special condition and is consistent with health, morals and general welfare of the community and is consistent with reasonable enjoyment of adjacent property.

Sec. 61.503. Conditional use permit, change requiring new permit.

A change to a conditional use requires a new permit when one (1) of the following conditions occurs:

(a) A conditional use changes from one (1) conditional use to another conditional use.

(b) The floor area of a condition use expands by fifty (50) percent or more. For a conditional use existing on October 25, 1975, expansion is the sum of the floor area of all the expansions since then. For a conditional use established after October 25, 1975, expansion is the sum of the floor area of all the expansions since being established. Floor area does not include floor area which is accessory to a principal use and which does not result in the expansion of a principal use.

(c) The building containing a conditional use is torn down and a new building is constructed, even if the new building contains the same or less floor area.

(d) The principal use of a conditional use expands onto an abutting lot, such as a used car lot or a fast food restaurant building addition expanding onto an abutting lot.

(e) The number of residents in a community residential facility increases, or the number of rooming units in a rooming or boardinghouse increases.

(f) A college, university or seminary adds a school building or an off-street parking facility for its exclusive use outside of its approved campus boundary.

Sec. 61.504. Change to conditional use, no new permit required.

A change to a conditional use does not require a new permit but does require approval of a site plan when one (1) of the following conditions occurs:

(a) The floor area of a conditional use expands by less than fifty (50) percent. For a conditional use existing on October 25, 1975, expansion is the sum of the floor area of all the expansions since then. For a conditional use established after October 25, 1975, expansion is the sum of the floor area of all the expansions since being established. Floor area does not include floor area which is accessory to a principal use and which does not result in the expansion of a principal use.

(b) An accessory use of a conditional use expands onto an abutting lot, such as a bowling alley's off-street parking lot expanding onto an abutting lot.

(c) Off-street parking spaces are added in a parking lot, garage or ramp on the site of a conditional use.

(d) An accessory structure is added to the site, such as a building to store salvaged motor vehicle parts being constructed on the site of a motor vehicle salvage operation.

(e) A college, university or seminary adds a school building or an off-street parking facility within its approved campus boundary.

ARTICLE VI. 61.600. VARIANCES

Sec. 61.601. Variances.

The board of zoning appeals shall have the power to grant variances from the strict enforcement of the provisions of this code upon a finding that:

(a) The property in question cannot be put to a reasonable use under the strict provisions of the code;

(b) The plight of the landowner is due to circumstances unique to the property, and these circumstances were not created by the landowner;

(c) The proposed variance is in keeping with the spirit and intent of the code, and is consistent with the health, safety, comfort, morals and welfare of the inhabitants of the city;

(d) The proposed variance will not impair an adequate supply of light and air to adjacent property, nor will it alter the essential character of the surrounding area or unreasonably diminish established property values within the surrounding area;

(e) The variance, if granted, would not permit any use that is not permitted under the provisions of the code for the property in the district where the affected land is located, nor would it alter or change the zoning district classification of the property; and

(f) The request for variance is not based primarily on a desire to increase the

value or income potential of the parcel of land.

In granting a variance, the board shall state the grounds upon which it justifies the granting of a variance. Hardship as described in the finding set out in subsection (a) above shall include the need for access to direct sunlight for solar energy systems.

ARTICLE VII. 61.700. APPEALS

Sec. 61.701. Administrative appeals.

(a) The board of zoning appeals shall have the power to hear and decide appeals where it is alleged by the appellant that there is an error in any order, requirement, permit, decision or refusal made by the zoning administrator in carrying out or

enforcing any provision of the code.

(b) The board of zoning appeals shall have the power to hear and decide appeals of orders, decisions or determinations made by the building official relative to the application and interpretation of the state building code.

(c) The grant or denial of approval by the planning or zoning administrator of site plans, permits or other matters that the planning commission has, by rule, delegated to the planning or zoning administrator is subject to appeal to the planning commission.

(d) An appeal may be taken by any person, firm or corporation, or by any office, department, board or bureau affected by a decision of the planning or zoning administrator or building official ten (10) days after the decision appealed from shall have been served either in person or by mail upon the owner of the property which is the subject matter of the decision, and shall specify the grounds of the appeal. The planning or zoning administrator shall forthwith transmit to the board or commission all of the papers constituting the record upon which the action appealed from was taken. An administrative appeal shall stay all proceedings, including criminal proceedings, in furtherance of the action appealed from unless the zoning administrator or building official certifies to the board or commission, after notice of appeal has been filed, that by reason of facts stated in the certificate a stay would cause imminent peril to life or property, in which case the proceedings shall not be stayed otherwise than by a restraining order granted by a court of competent jurisdiction.

(C.F. No. 04-537, § 1, 6-9-04)

Sec. 61.702. Appeals to city council.

(a) The city council shall have the power to hear and decide appeals where it is alleged by the appellant that there is an error in any fact, procedure or finding made by the board of zoning appeals or the planning commission. An appeal may be taken to the city council by any person, firm or corporation or by any office, department, board or bureau affected by a decision of the board of zoning appeals or planning commission. Such appeal shall be taken within ten (10) days after the decision appealed from. Appeals of decisions by the board of zoning appeals shall be filed with the office of license, inspection, and environmental protection; appeals of decisions by the planning commission shall be filed with the zoning section of the planning division. Appeals shall specify the grounds thereof and be accompanied by payment of the required fee.

(b) The city council shall conduct a hearing on the appeal, shall give due notice of the hearing to all interested parties as required under section 61.303, and shall render a decision on the appeal without unreasonable delay. Any person may appear and testify at the hearing either in person or by duly authorized agent or attorney.

(C.F. No. 04-537, § 1, 6-9-04)

Sec. 61.703. Permits suspended upon appeal.

Building permits shall not be issued after an appeal has been filed. If permits have been issued before an appeal has been filed, then the permits are suspended and construction shall cease pending a final decision on the appeal.

Sec. 61.704. Orders.

In exercising the above powers, the city council, planning commission, or board of zoning appeals may reverse or affirm, wholly or partly, or may modify the orders, requirements, decision or determination appealed from and may make such order, requirement, decision or determination as ought to be made. To that end, the board of zoning appeals shall have all the powers of the zoning administrator and the building official, and the city council shall have all the powers of either the board of zoning appeals or the planning commission. All final decisions, orders, requirements or determinations by the board of zoning appeals, planning commission, and/or city council shall be in the form of a written resolution. The city council shall serve a copy of the resolution upon the appellant and/or the owner of the affected property, zoning administrator, planning commission and board of zoning appeals by mail or personal service. The board of zoning appeals or planning commission shall serve a copy of the resolution upon the appellant and/or owner of the affected property, the zoning administrator and the planning administrator. Decisions of the city council on all matters within its jurisdiction shall be final subject only to judicial review by a court of competent jurisdiction.

ARTICLE VIII. 61.800. ZONING AMENDMENTS

Sec. 61.801. Changes and amendments.

(a) The council may, from time to time, amend, supplement or change the district boundaries or the regulations herein, or subsequently established herein pursuant to the provisions of Minnesota Statutes section 462.357 and amendments thereto as may be made from time to time. The city council shall provide for an adequate review and reevaluation of this code at least every five (5) years from the time of adoption of this code. The planning commission may, from time to time, review district boundary lines to determine if, pursuant to state laws, such district boundary lines should be changed.

(b) Except as provided for in section 66.802, an amendment to the zoning code may be initiated by the council, the planning commission or by application of the owners of sixty-seven (67) percent of the area of the property to be rezoned.

(c) When a petition is required to be filed pursuant to this section or by state law to effectuate or consent to the rezoning of any particular piece of property, it shall not be considered as officially filed with the planning administrator until the lapse of seven (7) working days after a petition is received in the office of the planning administrator. During the seven-day waiting period, any signator of any petition may withdraw his name therefrom by written request, and such request shall be appended to the subject petition and made a part thereof. Each petition and applicable requests for withdrawal of a signator's name shall be considered in determining the sufficiency of the petition, and the jurisdiction of any city department and the council regarding any petition shall not be considered established until the petition has been found to be sufficient.

Sec. 61.802. Amendment limitations.

A petition amending, supplementing or changing district boundaries, once denied by council, shall not be resubmitted for recommendation or action within one (1) year from date of denial.

Sec. 61.803. Amendment's effect on pending uses and structures.

Uses that were permitted to be established and structures that were permitted to be constructed before amendments to this zoning code but are no longer permitted by the amendments may be established or constructed, provided that they meet the following conditions:

(a) Uses and structures that need building permits to be established or constructed may be established or constructed, provided that before the effective date of the amendments:

(1) The uses or structures have received all required zoning permits from the planning commission or the board of zoning appeals, or if the zoning permits are appealed, the city council; and

(2) Valid building permit applications have been made or valid building permits have been issued for the establishment of the uses or for the construction of the structures.

If the construction needed to establish the uses or the construction of the structures has not begun within six (6) months of the issuance of the building permits, the uses or structures may not thereafter be established or constructed. For the purpose of this section demolition preparatory to construction shall be considered construction.

(b) Uses not needing building permits must be established before the effective date of the amendments.

This section shall not apply to interim ordinances adopted in accordance with Minnesota Statutes, chapter 462.355, subdivision 4.

ARTICLE IX. 61.900. ENFORCEMENT

Sec. 61.901. Violations.

Any person, firm or corporation violating any of the provisions of this code shall be guilty of a misdemeanor. In addition, the owner or lessee of any building, structure or premises or part thereof, where any condition in violation of this code shall exist or be created, and who has assisted knowingly in the commission of such violation, shall be guilty of a separate offense, and upon conviction thereof shall be guilty of a misdemeanor.

Sec. 61.902. Public nuisance.

Any building or structure which is erected, altered or converted, or any use of premises or land which is begun or changed subsequent to the time of adoption of this code and in violation of any of the provisions thereof, is hereby declared to be a public nuisance per se, and may be abated by order of any court of competent jurisdiction.

Sec. 61.903. Fines, imprisonment.

The owner of any building, structure or premises or part thereof, where any condition in violation of this code shall exist or shall be created, and who has assisted knowingly in the commission of such violation, shall be guilty of a separate offense, and upon conviction thereof shall be liable to the fines and imprisonment herein provided.

Sec. 61.904. Each day a separate offense.

A separate offense shall be deemed committed upon each day during or when a violation occurs or continues.

Sec. 61.905. Rights and remedies are cumulative.

The rights and remedies provided herein are cumulative and in addition to any other remedies provided by law.

Chapter 33. Building Code and Inspection*

- Sec. 33.01. Definitions.
- Sec. 33.02. Minnesota State Building Code--Adoption.
- Sec. 33.03. Permits--When required.
- Sec. 33.04. Establishment of permit fees.
- Sec. 33.05. Certificate of occupancy.
- Sec. 33.06. Certificate of compliance.
- Sec. 33.07. Fences--Requirements.
- Sec. 33.08. Street encroachments.

***Cross reference(s)--**Licenses for building contractors, Ch. 326.

Sec. 33.01. Definitions.

The following words and phrases when used in this chapter shall have the meanings respectively ascribed to them in this section:

Building official. Building Code Official, of the Office of License, Inspections and Environmental Protection, or his/her designee, charged with the administration and enforcement of the Minnesota State Building Code for the City of Saint Paul.

Clean fill. Materials consisting of at least ninety (90) percent natural soils with the remaining ten (10) percent maximum composed of concrete, concrete block, brick, glass or similar inert materials.

Demolition clean fill. Materials consisting of more than ten (10) percent but less than fifty (50) percent concrete, concrete block, brick, glass or similar inert material which has been approved in writing by the Ramsey County Division of Solid Waste with the remaining percentage comprising natural soils.

Ramsey County Erosion and Sediment Control Handbook. The document which contains the erosion and sediment control practice specifications and the planning procedures to control soil erosion and sedimentation adopted by the Ramsey County Soil and Water Conservation District.

(Code 1956, 25.019; Ord. No. 17588, 9-13-88; Ord. No. 17867, § 1, 8-13-91; C.F. No. 97-1423, § 1, 12-22-97; C.F. No. 98-89, § 1, 3-4-98; C.F. No. 99-227, § 1, 4-14-99)

Sec. 33.02. Minnesota State Building Code--Adoption.

(a) Pursuant to Minnesota Statutes, Sections 16B.59 through 16B.73, the Minnesota State Building Code, as adopted pursuant to laws of Minnesota, is hereby adopted by reference.

(b) The following appendix is not a mandatory part of the Minnesota State Building Code, but is adopted by reference for the City of Saint Paul and is incorporated into this chapter as if set out in full: Uniform Building Code Appendix Chapter 33.

(c) Chapter 5230 of the Minnesota Rules, "Steamfitters Rules and Code for Power Piping Systems," as amended, is adopted by reference by the City of Saint Paul and incorporated into this chapter as if set out in full and shall be the minimum standard used by the building official in the inspection of high-pressure piping system materials and construction.

(d) Section 109 of the Uniform Building Code, a part of the Minnesota State Building Code in Minnesota Rule 1300.1200, is amended for the City of Saint Paul to read as follows:

SECTION 109 - CERTIFICATE OF OCCUPANCY

109.1 Use and Occupancy. No building or structure shall be used or occupied, and no change in the existing occupancy classification of a building or structure or portion thereof shall be made until the fire marshal has issued a certificate of occupancy therefor as provided herein.

EXCEPTION: Group R, Division 3 and Group U Occupancies.

Issuance of a certificate of occupancy shall not be construed as an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Certificates presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid.

109.2 Change in Use. Changes in the character or use of a building shall not be made except as specified in Section 3405 of this code.

109.3 Certificate Issued. After the fire marshal inspects the building or structure and finds no violations of the provisions of this code or other laws that are enforced by the code enforcement agency, the fire marshal shall issue a certificate of occupancy that shall contain the following:

1. The building permit number.
2. The address of the building.

3. The name and address of the owner.

4. A description of that portion of the building for which the certificate is issued.

5. A statement that the described portion of the building has been inspected for compliance with the requirements of this code for the group and division of occupancy and the use for which the proposed occupancy is classified.

6. The name of the building official.

109.4 Temporary Certificate. If the building official finds that no substantial hazard will result from occupancy of any building or portion thereof before the same is completed, a temporary certificate of occupancy may be issued for the use of a portion or portions of a building or structure prior to the completion of the entire building or structure.

109.5 Posting. The certificate of occupancy shall be posted in a conspicuous place on the premises and shall not be removed except by the fire marshal.

109.6 Revocation. The fire marshal may, in writing, suspend or revoke a certificate of occupancy issued under the provisions of this code whenever the certificate was issued in error, or on the basis of incorrect information supplied, or when it is determined by the fire marshal that a use of the building or structure or portion thereof may constitute a nuisance as described in Minnesota Statutes, section 617.81, subdivision (2), or is in violation of any ordinance or regulation or any of the provisions of this code.

(Code 1956, § 25.02; Ord. No. 17219, §§ 1, 2, 3-12-85; Ord. No. 17250, § 1, 6-13-85; Ord. No. 17514, § 1, 12-1-87; Ord. No. 17599, § 1, 10-11-88; Ord. No. 17687, § 2, 8-13-91; C.F. No. 95-517, § 1, 6-21-95; C.F. 95-1481, § 1, 1-10-96; C.F. No. 97-1423, § 2, 12-22-97; C.F. No. 99-227, § 1, 4-14-99; C.F. No. 00-890, § 1, 11-22-00)

Sec. 33.03. Permits--When required.

(a) *Building and general construction.* Permits for building or general construction are not required for repairs for maintenance only or for minor alterations provided they are not required under Section 106 of the 1997 Uniform Building Code as adopted by the Minnesota State Building Code, this chapter or other pertinent provisions of the Saint Paul Legislative Code, and provided the cost of such repairs and minor alterations does not exceed the present market value of five hundred dollars ($500.00).

(b) *Plumbing.* No person shall install, remove, alter, repair, or replace or cause to be installed, removed, altered, repaired or replaced any plumbing, gas or drainage piping work, standpipe system, sprinkler system, or any fixture or water heating or treating equipment in a building or premises without first obtaining a permit to do such work from the building official. A separate permit shall be obtained for each building or structure.

(c) *Mechanical.* No person shall install, alter, reconstruct, or repair any heating, ventilating, cooling or refrigeration equipment without first obtaining a permit to do such work from the building official. A separate permit shall be obtained for the equipment installed in each building or structure.

(d) *Electrical.* No person shall perform any new electrical installation in any construction, remodeling, replacement or repair, except minor repair work as defined by the state board of electricity, without first obtaining a permit to do such work from the building official. A separate permit shall be obtained for each building or structure.

(e) *Work to be done by permittee only:*

(1) A permittee issued a permit pursuant to this chapter shall be responsible for all work done under said permit.

(2) Business required to be licensed pursuant to Chapter 369 of the Legislative Code:

No one other than the permittee or an employee under the direct supervision and control of the permittee or a qualified subcontractor licensed pursuant to chapter 369 of the Legislative Code shall work or cause any work to be done under said permit.

(f) *Work done on dangerous structures, nuisance buildings and vacant buildings.* No persons shall be issued a permit pursuant to this chapter, excluding a demolition permit, for any building determined to be a dangerous structure under Chapter 43 or nuisance building under Chapter 45 of the Saint Paul Legislative Code, or a vacant building as defined under section 43.02(7)(c), (d), (e) or (f) without first filing for and receiving a certificate of code compliance inspection under section 33.06 or filing for and receiving a certificate of occupancy inspection under this chapter. Any application for a permit issued under this chapter, with the exception of a demolition permit, for work to be done on a building determined to be a dangerous structure or nuisance building must be accompanied by a deposit of two thousand dollars ($2,000.00). Such monies shall be deposited with the office of license, inspections and environmental protection to be held at an interest rate to be established by that department until such time as the monies are refunded to the permittee or forfeited to the city under the provisions of this section.

Except as otherwise specified in this section, a certificate of compliance under section 33.06 or a certificate of occupancy under section 33.05 must be obtained within six (6) months from the date of the original certificate of compliance or certificate of occupancy inspection. One (1) six-month time extension beyond the initial six-month time limitation may be requested by the owner and will be considered by the building official if it can be shown that the code compliance work is proceeding expeditiously and is more than fifty (50) percent complete or if unforseen conditions have had significant schedule impact on the completion of work.

The provisions for completion of rehabilitation within six (6) months and the six-month extension apply only to property not presently subject to any orders issued to the property pursuant to Chapter 43 or 45 of the Saint Paul Legislative Code by either the division of property code enforcement, the department of fire and safety services or the city council. Notwithstanding the time limitation established under this section, the city council reserves the right to shorten the time period for completion of the rehabilitation through any order or resolution issued pursuant to Chapter 43 and sections 45.10 and 45.11 of this Code.

In the event the building is restored to habitable condition and a certificate of compliance and/or certificate of occupancy is

obtained within the time limits set out herein, the two thousand dollars ($2,000.00) shall be refunded with interest by the department of finance.

If a certificate of compliance or certificate of occupancy is not issued within the time period authorized pursuant to this section, all monies deposited will be forfeited without refund to the city and the city may proceed with a substantial abatement action under the provisions of Chapter 45 of this Code.

No building subject to the restrictions of this section shall be used for occupancy until such time as the certificate of compliance and/or certificate of occupancy relating to that building has been issued. Rehabilitation undertaken by the Saint Paul Department of Planning and Economic Development shall be exempt from the requirement for a cash deposit.

In lieu of the two thousand dollar ($2,000.00) deposit referenced above, a performance bond in the same amount running in favor of the city may be submitted with the application for the permit.

(g) *Grading.* No person shall perform any filling or excavating activity on a property unless such activity is in accordance with the provisions of Appendix Chapter 33 of the 1997 Uniform Building Code and the requirements herein.

(1) Except as provided in the Ramsey County Solid Waste Ordinance, only clean fill may be deposited as fill material on the property.

(2) Grading activities in excess of ten thousand (10,000) square feet shall be in accordance with section 62.108(13) of the Saint Paul Legislative Code.

(3) The property owner and permittee shall be responsible for the grading on site.

(4) Erosion and sediment control installation shall be set forth in the Ramsey County Erosion and Sediment Control Handbook. The property owner and permittee shall be responsible for maintaining any required erosion and sediment control installations. This maintenance requirement shall also include sediment laden runoff onto adjacent properties or public ways.

(h) *Posting.* The building or general construction permit shall be posted on the premises in a conspicuous location such that the information on the permit can be read from the outside of the premises.

(Code 1956, § 25.03; Ord. No. 16854, 11-19-81; Ord. No. 17250 § 2, 6-13-85; Ord. No. 17587, § 1, 9-13-88; Ord. No. 17681, § 1, 10-3-89; Ord. No. 17866, § 1, 8-13-91; Ord. No. 17867, § 3, 8-13-91; C.F. No. 92-662, § 1, 8-6-92; C.F. No. 97-761, § 1, 7-9-97; C.F. No. 97-1423, § 3, 12-22-97; C.F. No. 97-1407, § 1, 12-10-97; C.F. No. 99-227, § 1, 4-14-99; C.F. No. 99-751, § 1, 9-1-99; C.F. No. 03-33, § 1, 2-12-03; C.F. No. 03-887, § 2, 11-5-03; C.F. No. 04-175, § 1, 3-3-04)

Sec. 33.04. Establishment of permit fees.

(A) *Fees required:* Before issuing any permit required by the building code, this chapter or other pertinent provisions of the Saint Paul Legislative Code, the fee as indicated in the following schedule shall be paid.

Where work for which any such permit is required is started or proceeded with prior to obtaining said permit, the fee specified shall be collected and, in addition, a penalty fee shall be collected. The penalty fee shall be equal to the specified permit fee. The payment of such penalty fee shall not relieve any person from fully complying with the requirements of the building codes in the execution of the work or from any other penalty prescribed herein.

Building valuation for the purpose of establishing building permit fees shall be as set forth by the valuation data published by the Building Code Division, Department of Administration, State of Minnesota, as may be amended from time to time.

Value of work other than that included in the valuation data published by the Building Code Division, State of Minnesota, must include the cost of installations, alterations, additions or repairs, including all labor and materials supplied by the contractor and other sources. The building code officer may require the contractor to furnish the city with a written statement of the actual cost of the work. When such costs exceed those for which the permit was issued, an additional permit fee will be required and collected based on the fee schedule established herein.

TABLE A

BUILDING PERMIT FEES FOR

GENERAL CONSTRUCTION

Total Valuation	Fee
$501.00 to $2,000.00....	$23.50 for the first $500.00 plus $3.05 for each additional $100.00 or fraction thereof, to and including $2,000.00
$2,001.00 to $25,000.00....	$69.25 for the first $2,000.00 plus $14.00 for each additional $1,000.00 or fraction thereof, to and including $25,000.00
$25,001.00 to $50,000.00....	$391.25 for the first $25,000.00 plus $10.10 for each additional $1,000.00 or fraction thereof, to ar including $50,000.00
$50,001.00 to $100,000.00....	$643.75 for the first $50,000.00 plus $7.00 for each additional $1,000.00 or fraction thereof, to anc including $100,000.00
$100,001.00 to $500,000.00....	$993.75 for the first $100,000.00 plus $5.60 for each additional $1,000.00 or fraction thereof, to ar including $500,000.00
˜500,001.00 to ,000,000.00....	$3,233.75 for the first $500,000.00 plus $4.75 for each additional $1,000.00 or fraction thereof, to and including $1,000,000.00
$1,000,001.00 and up....	$5,608.75 for the first $1,000,000.00 plus $3.65 for each additional $1,000.00 or fraction thereof

Other inspections and fees:

(1) Inspections outside of normal business hours.... $80.00 per

	hour
(Minimum charge--Two (2) hours)	
(2) Reinspection fees assessed under provisions of Section 305(g) U.B.C....	$53.00 per hour
(Minimum charge--One (1) hour)	
(3) Inspections for which no fee is specifically indicated....	$53.00 per hour
(Minimum charge -- One hour)	
(4) Additional plan review required by changes, additions or revisions to approved plans....	$53.00 per hour
(Minimum charge -- One hour)	
(5) Inspections of buildings to be moved:	
(a) Garages and group U occupancies....	$53.00
(b) Dwellings other than group U occupancies....	$80.00
(c) Structures located outside city limits will have an additional fee of fifty-five dollars ($55.00) per hour including travel time	
(Minimum charge--One (1) hour)	

(B) *Plan review fees:* For valuation under one thousand dollars ($1,000.00), no fee shall be assessed. When the valuation of the proposed construction exceeds one thousand dollars ($1,000.00), a plan review fee shall be paid to the building official at the time of submitting plans and specifications for checking review. Plan review fees shall be sixty-five (65) percent of the total building permit fee as set forth in the table above.

(C) *Expiration of plan check:* Applications for which no permit is issued within one hundred eighty (180) days following the date of application shall expire by limitation, and plans and other data submitted for checking may thereafter be returned to the applicant or destroyed by the building official. The building official may extend the time for action by the applicant for a period not exceeding one hundred eighty (180) days upon written request by the applicant showing that circumstances beyond the control of the applicant have prevented action from being taken. No application shall be extended more than once. In order to renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan checking fee.

(D) *Expiration of building permit:*

(1) Every permit issued by the building official under the provisions of this chapter shall expire by limitation and become null and void if the building of work authorized by such permit is not commenced within one hundred eighty (180) days from the date of such permit or if the building or work authorized by such permit is suspended or abandoned at any time after the work is commenced for a period of one hundred eighty (180) days. Before such work can be recommended, a new permit shall be first obtained so to do, and the fee therefor shall be one-half the amount required for a new permit for such work, provided no changes have been made or will be made in the original plans and specifications for such work; and provided further, that such suspension or abandonment has not exceeded one (1) year.

(2) Any permittee holding an unexpired permit may apply for an extension of the time within which he may commence work under that permit when he is unable to commence work within the time required by this section for good and satisfactory reasons. The building official may extend the time for action by the permittee for a period not exceeding one hundred eighty (180) days upon written request by the permittee showing that circumstances beyond the control of the permittee have prevented action from being taken. No permit shall be extended more than once. In order to renew action on a permit after expiration, the permittee shall pay a new full permit fee.

(3) Moreover, all work commenced pursuant to the issuance of a building permit by the building official for construction, alteration, repair or remodeling of the exterior portion of a single-family dwelling or two-family dwelling, including an attached or detached garage, must be completed within one (1) year from the date of issuance of the building permit or within one (1) year from the effective date of this chapter, whichever is later. The building official may extend the time for completion upon written request of the permittee establishing that circumstances beyond the control of the permittee establishing that circumstances beyond the control of the permittee prevented completion of the work for which the building permit was authorized.

(4) All work commenced pursuant to the issuance of a building permit by the building official for construction, alteration, repair or remodeling of the exterior or the interior portions of R-I properties or commercial properties where the permit valuation is under $500,000, must be completed within one (1) year from the date of issuance of the building permit or within one (1) year from the effective date of this chapter, whichever is later. The building official may extend the time for completion upon written request of the permittee establishing that circumstances beyond the control of the permittee prevented completion of the work for which the building permit was authorized.

(5) Any person who violates subsection 33.04(D) shall be guilty of a misdemeanor.

(E) *Suspension or revocation of building permit:* The building official may, in writing, suspend or revoke a permit issued under provisions of this chapter whenever the permit is issued in error or on the basis of incorrect information supplied, or in violation of any ordinance or regulation or of any of the provisions of the state building code.

(F) *Refund of permit fees:*

(1) The building official may authorize the refunding of any fee paid hereunder which was erroneously paid or collected.

(2) The building official may authorize the refunding of not more than eighty (80) percent of the permit fee paid when no work has been done under a permit issued in accordance with this code.

(3) The building official may authorize the refunding of not more than eighty (80) percent of the plan check fee paid when an application for a permit for which a plan check fee has been paid is withdrawn or canceled before any plan checking is done.

The building official shall not authorize the refunding of any fee paid except upon written application filed by the original permittee not later than one hundred eighty (180) days after the date of fee payment.

(G) *Other permit fees:* Permit fees for other than general construction shall be as follows:

(1) *Wrecking of buildings or structures.* $4.00 per 1,000 cubic feet or fraction thereof, minimum $58.00.

(2) *Moving of buildings or structures.* Buildings larger than 12 feet high, 14 feet wide, 25 feet long other than buildings used for Group U, Division 1, occupancies: $210.00 per move. Group U, Division 1, occupancy buildings larger than 12 feet high, 14 wide, 25 long: $69.00 per move. Buildings or structures smaller than size indicated above: $58.00 per move.

(3) *Elevators, dumbwaiters, moving stairways, handicapped lifts and other similar devices:*

(a) New construction, repairs and major alterations: One and one-half percent of the total valuation of the work. Minimum charge shall be $103.00.

(b) *Annual inspection fees:*

1. Power driven passenger and freight elevator:

Up to 5 floors in height $55.00

6 to 10 floors in height 63.00

11 to 20 floors in height 70.00

21 or more floors in height 79.00

2. Dumbwaiter 39.00

3. Moving stairway 39.00

4. Docklift 39.00

5. Handpowered elevator 39.00

6. Manlift 39.00

(4) *Electrical work.* For electrical work the permit fee charges shall be made at the following rates; provided, however, the minimum fee for any permit shall be: one-family dwelling electrical work $39.00, multifamily, commercial and industrial work, $48.00.

(a) Service: New service, change of service, temporary service, addition, alteration or repair on either primary or secondary service up to 600v shall be $48.00.

(b) Circuits: The fee for the installation of new circuits and/or feeder additions, alterations or repairs to existing circuits up to 600v shall be $10.00.

(c) Transformers, capacitors, and generation for light, heat and power: Transformers, capacitors, and generation for light, heat and power shall be computed separately at $28.00 per unit plus $1.00 per KVA, KVAR or fraction thereof. In addition to the above fees, the fee for all transformers for signs and outline lighting shall be $34.00 per sign.

(d) Alterations, repairs, or extension of electrical systems: For any alteration, repair or extension of an existing electrical system where the work is of such a nature that the fees for a permit cannot be determined from the above schedule, the permit fee charge shall be based on one percent of the total valuation of the work. Minimum fee shall be $58.00.

(e) Low-voltage fire alarm systems, remote-control circuits, signal circuits, and low-energy or low-voltage power circuits: For remote control circuits, signal circuits, and low-energy or low-voltage power circuits (in other than single-family dwellings) the permit fee charge shall be:

1.	Fire alarms....	$55.00 per control plus
		$1.40 for each opening.
2.	Others....	$42.00 per control plus
		$1.40 for each opening.

(f) Traffic signals: For traffic signals the permit fee charge shall be made at the rate of $34.00 for each service location plus $7.00 for each standard.

(g) Street lighting: For street lighting the permit fee charge shall be made at the rate of $28.00 for each control unit plus $7.00 for each standard.

(h) Electric space heating:

0 to 4000 watts $14.00

4001 watts and up 21.00

(i) Transient projects: For permits on transient projects, including, but not limited to, carnivals and circuses, the inspection fees shall be computed as follows:

Power supply units--According to items (a), (b) and (c) of the electric work fee schedule.

All rides, devices and concessions shall be inspected, the inspection fee shall be $21.00 per unit.

(j) Swimming pools: $55.00 plus circuit charge.

(5) *Gas burner, oil burner, coal burner and other fuel burners.* $58.00 for the first 100,000 btu per hour input or fraction thereof, plus $11.00 for each additional 100,000 btu per hour or fraction thereof. Maximum fee for each individual burner shall be $757.00. Where dual fuel installations are made, the maximum combined permit fee shall not exceed $1,375.00.

(6) *Plastering, stucco and spray-on fireproofing.* For plastering and stucco, the fee is $75.00 for the first 200 square yards or fraction thereof and $8.00 for each additional 20 square yards or fraction thereof. For redash, spray-on fireproofing or patching, the fee is one (1) percent of the valuation of the work; provided, however, that the minimum fee for any permit is $53.00.

(7) *Plumbing fees:*

(a) Drain waste and vent, water supply and fixtures.

1. The fee for all initial permits issued by the office of license, inspections and environmental protection shall be $76.00. In addition to this fee, the fee for each fixture, whether set, rough-in, or replaced shall be $28.00. Each water supply fixture shall be $6.00.

(b) Building sewer permit fees $62.00

(c) Each private waste treatment system 213.00

(d) Gas burning water heaters, dryers, ranges or other devices including gas piping:

1. For devices up to 100,000 BTU's, each 28.00

2. Each additional 100,000 BTU's or portion thereof 11.00

3. Minimum fee 58.00

4. Maximum fee 757.00

(8) *Standpipes, sprinklers and fire pumps; new installations, repairs or alterations:*

(a) The minimum fee shall be $42.00, in addition to which the following fees shall be paid:

1. Standpipes: $64.00 for each standpipe for the first five (5) floors, plus $7.00 for each floor above the fifth.

2. Sprinklers: $15.50 for each additional ten (10) sprinkler heads or fraction thereof.

3. Fire pumps: $50.00 for each pump.

(b) Fire extinguishing systems utilizing an extinguishing agent other than water, new installations, repairs or alterations: The fee shall be one percent of the valuation of the installation, repair or alteration with a minimum fee of $42.00.

(9) *Refrigeration:*

(a) Refrigeration permit: One (1) percent of total value of work, minimum fee of $58.00.

(b) Total value of work is defined under section 33.04(A).

(10) *Signs, billboards, marquees and awnings:*

(a) Wall, roof, projecting and freestanding signs: $2.10 for each square foot with a minimum fee of $58.00.

(b) Marquees over public property: $138.00 for each installation.

(c) Billboards: $138.00 zoning approval fee plus one (1) percent of the total valuation of the construction cost.

(d) Awnings projecting over public property: $2.10 per lineal foot, minimum $58.00 for each installation. A separate sign permit is required for awnings with signage.

(11) *Steamfitting and hot water work:*

(a) Fee for new construction or alteration shall be one (1) percent of total valuation of the work.

Value of work must include the cost of installation, alteration, addition and repairs including heat transfer units, accessories to the heating system, including pipe, fittings, and all labor and materials necessary for installation.

In addition, it shall include all materials supplied by other sources when these materials are normally supplied by the contractor.

(b) Minimum permit fee for commercial, industrial, institutional or business occupancies is $58.00.

(c) The fee for alterations, additions and repair to existing refrigeration, gas and oil systems shall be based on one (1) percent of total valuation of the work with $58.00 minimum.

(12) *Warm air, heating, ventilation and sheet metal:*

(a) Mechanical warm air heating systems: $58.00 for the first 100,000 btu per hour or fraction thereof, plus $11.00 for each additional 100,000 btu per hour or fraction thereof.

(b) Ventilation systems, dust collection systems, pollution control systems, etc.: One (1) percent of total valuation of the work. Value of work must include the cost of installation, alteration, addition and repair, including all labor and materials necessary for installation. The minimum fee shall be $58.00 for commercial buildings and $34.00 for residential ventilation work and duct modification.

(c) *General sheet metal:* A separate permit is required for general sheet metal work. For gutters, flashing, metal chimneys, chutes or general sheet metal work, the fee shall be one percent of the total valuation of the work. The minimum fee is

$58.00.

(13) *Incinerators:*

(a) Domestic incinerators: $58.00 for each installation.

(b) Commercial and industrial incinerators: One (1) percent of total value of work, minimum $58.00 for each installation.

(14) *Fences:* $31.00 for the first 200 lineal feet or fraction thereof erected and $11.00 for each additional 100 lineal feet or fraction thereof.

(15) *Other projects:* For alterations, repairs or extensions for which the fee charge cannot be determined by items (1) through (14) above, the fee charge shall be based on one (1) percent of the total valuation of the work, with a minimum fee of $58.00.

(16) *Reserved.*

(17) *Solid fuel burning freestanding heaters and stoves, nonmasonry fireplaces and fire place inserts:* $58.00. Method for providing positive combustion air must be provided with permit application.

(18) *Solar heating systems:* Permit fees for solar heating systems shall be one (1) percent of total valuation, with a minimum fee of $58.00.

(19) *Parking lots:*

(a) Permit fees for parking lots shall be one (1) percent of total valuation, with a minimum fee of $58.00. No parking lot or loading and unloading area requiring approval under the provisions of Legislative Code sections 62.103 and 62.105 shall be constructed nor shall any existing unimproved lot be paved without first obtaining a building permit. Such lots shall not be used until the construction has been completed and approved by the building code officer.

(b) No off-street parking lot or loading and unloading area shall be repaved, modified, reconfigured or enlarged without first obtaining a building permit. The permit fee shall be one (1) percent of the total valuation, with a minimum fee of $58.00.

(20) *Tank installation and removal:*

(a) Tank removal: $138.00.

(b) Tank installation: One (1) percent of the total valuation, with a minimum fee of $58.00.

(H) *Fees, exemption for city:* The city shall be exempted from the payment of permit fees required under this chapter where work is done by city employees on city-owned property not exclusively leased or rented to a party other than the city.

It is the intent of this paragraph only that payment of fees are waived. Permits as required by other sections of the Saint Paul Legislative Code are to be applied for and issued, inspections are to be made as required and compliance with all other requirements must be made.

(Code 1956, § 25.06; Ord. No. 16792, 5-16-81; Ord. No. 16796, 5-16-81; Ord. No. 16854, 11-19-81; Ord. No. 16899, 3-25-82; Ord. No. 16925, 5-27-82; Ord. No. 16957, 9-21-82; Ord. No. 17051, 9-13-83; Ord. No. 17070, 11-8-83; Ord. No. 17115, 3-13-84; Ord. No. 17151, 8-14-84; Ord. No. 17152, 8-14-84; Ord. No. 17153, 8-14-84; Ord. No. 17250, §§ 3--8, 6-13-85; Ord. No. 17469, § 1, 6-30-87; Ord. No. 17867, §§ 4--9, 8-13-91; C.F. No. 95-517, § 2, 6-21-95; C.F. No. 98-89, § 2, 3-4-98; C.F. No. 99-227, § 1, 4-14-99; C.F. No. 00-61, § 1, 2-9-00; C.F. No. 00-749, § 1, 9-20-00; C.F. No. 00-862, § 1, 11-15-00; C.F. No. 01-11, § 1, 2-7-01; C.F. No. 01-248, § 1, 4-4-01; C.F. No. 01-647, § 1, 7-18-01; C.F. No. 03-33, § 2, 2-12-03; C.F. No. 03-889, § 1, 11-5-03)

Sec. 33.05. Certificate of occupancy.

(A) *Use or occupancy:* No building or structure in Group A (Assembly), B (Business), M (Mercantile), E (Education), F (Factory), I (Institutional), H (Hazardous), R-1 (Multifamily Residential), nuisance dwelling as defined in, and to the extent and for the periods required, in Chapter 42 of the Legislative Code, or S (Storage) occupancies shall be used or occupied, and no change in the existing occupancy classification of a building or structure or portion thereof shall be made, until the fire marshal has issued a certificate of occupancy therefor as provided herein, except for dwelling units occupied by an owner. The word "owner" means a natural person, and does not include a corporation, partnership or other entity.

(B) *Change in use:* Changes in the character or use of a building shall not be made without the approval of the building official and the fire marshal, and the building may be occupied for purposes in other groups provided the new or proposed use is less hazardous, based on life and fire risk, than the existing use.

(C) *Certificate issued:* After final inspection by the building official, when it is found that the building or structure complies with the provisions of this Code, the fire marshal shall issue a certificate of occupancy.

(D) *Existing buildings:* Every building except one- and two-family dwellings which are not nuisance dwellings as defined in, and for the periods required by, Chapter 42 of the Legislative Code and residential garages heretofore erected shall have a certificate of occupancy issued by the division of fire prevention and posted on the premises. Before such a certificate can be issued, such buildings shall be inspected by the division and found to conform to the requirements of the building code at the time of construction or at the time of conversion to its present use and to the provisions of the Saint Paul Legislative Code; except that energy efficient standards in rental dwellings and multiple dwellings shall be enforced on complaint basis only. No building which is required to have a certificate of occupancy shall continue to be occupied without such certificate.

(E) *Renewal required:* An inspection shall be scheduled by the division of all buildings of Group A (Assembly), E (Education), I (Institutional), H (Hazardous), and B (Business), M (Mercantile), S (Storage), F (Factory), and R (Residential) occupancies which have a certificate of occupancy. Inspections shall be scheduled by the division on a two-year cycle for all buildings of R-1 occupancy which have a certificate of occupancy. Inspections shall be scheduled on a one-year cycle for all nuisance dwellings as defined in, and during the periods required by, Chapter 42 of the Legislative Code. If it is found that such buildings do not conform to the applicable requirements, the certificate of occupancy may be revoked and the building shall

not be occupied until such time as the building is again brought into compliance with such requirements.

(1) Reserved.

(2) Nonresidential renewal schedule. The fire marshal shall establish written guidelines for the renewal of nonresidential occupancies based on the hazard of the occupancy.

(a) The fire marshal shall provide an annual written report of nonresidential inspections that includes group, property address, and inspection schedule to the city council.

(b) Revocations or condemnations. Where the certificate of occupancy has been revoked, or the building has been condemned, once the certificate of occupancy is restored it shall be scheduled for renewal in one year.

(F) *Fees for certificate of occupancy:*

(1) *Original issue, new buildings.* There shall be no fee charged for an issuance of the certificate of occupancy for new buildings at the completion of their construction covered by a building permit.

(2) *Renewal fee for R-1 occupancies.* Thirteen dollars ($13.00) per residential unit, minimum fee one hundred forty-four dollars ($144.00), maximum fee five hundred thirty-three dollars ($533.00). The fee charged for inspections of nuisance dwellings as defined in section 42.01(2) of the Legislative Code shall be in an amount as established by the fire marshal to recover the costs of the inspections.

(3) *Renewal fee for A (Assembly), E (Education), I (Institutional), H (Hazardous), F (Factory), M (Mercantile), S (Storage) and B (Business) occupancies.* Eleven dollars ($11.00) per one thousand (1,000) square feet, minimum fee one hundred forty-four dollars ($144.00), maximum fee five hundred thirty-three dollars ($533.00).

(4) *Reinspection fee.* The renewal fee established in subsections (2) and (3) above allows for one (1) inspection and one (1) reinspection for the renewal of the certificate of occupancy. A reinspection fee of fifty (50) percent of the renewal fee shall be levied for each additional reinspection required of nonconforming occupancies.

(5) *Referral reinspection fee.* Whenever a written correction order is issued to the owner or responsible agent of the owner for a violation of this code and after a reasonable time for compliance has elapsed, a reinspection shall be made. If the violation has not been corrected at the time of the reinspection, a referral reinspection fee of fifty-eight dollars ($58.00) shall be collected for every subsequent reinspection until the violation is corrected.

(6) *Partial certificate of occupancy fee.* Notwithstanding subsection (1) of this paragraph (F), a fee of one hundred thirty-eight dollars ($138.00) will be charged for each partial certificate of occupancy requested. The issuance of a partial certificate of occupancy is at the discretion of the building official and the portion of the building covered by the certificate must be legally completed and ready to occupy along with all other life and safety requirements.

(7) *No entry fee.* A no entry fee of fifty-eight dollars ($58.00) shall be assessed to the renewal fee and collected whenever an owner or responsible agent of the owner has been notified in writing of the date and time for a certificate of occupancy renewal inspection, or any other reinspection, and the owner or responsible agent of the owner fails to notify the fire marshal's office in writing, by at least 8:00 a.m. on the date of the scheduled inspection, of an alternate date and time for the inspection or reinspection when the owner or responsible agent of the owner will appear for the inspection.

(8) *Discounted fee.* Whenever a certificate of occupancy renewal inspection finds no violations of any applicable code, the renewal fees set forth in subsections (2) and (3) of this paragraph shall be discounted twenty-five (25) percent.

(9) *Late fees.* A late fee shall be charged and collected whenever the owner or responsible agent for the owner makes application for certificate renewal after the expiration date of such certificate. Separate late fees shall also be charged and collected whenever the owner or responsible agent for the owner pays late any other fees due and payable under this section. All late fees shall be ten (10) percent of the certificate renewal fee. A late fee shall accrue for each thirty-day period or portion thereof which has elapsed after the expiration date of the certificate or the date of inspection on which the underlying fee is based. In no event shall any one (1) late fee exceed fifty (50) percent of the certificate renewal fee. The late fee(s) shall be in addition to any other fee or payment required.

(G) *Exceptions:* The fees for the certificate of occupancy and inspection are provided in section 33.04(H)(4)(c) and paragraph (F) of this section shall be required on buildings owned and occupied by any governmental agency, including county and state governmental agencies. The City of Saint Paul, and any other agencies specifically exempted from such fees under state law, shall be exempt from payment of such fees.

(Code 1956, § 25.07; Ord. No. 16854, 11-19-81; Ord. No. 16904, 4-8-82; Ord. No. 17379, § 3, 7-29-86; Ord. No. 17599, § 2, 10-11-88; C.F. No. 92-700, § 1, 7-7-92; C.F. No. 95-517, § 3, 6-21-95; C.F. No. 95-1481, § 2, 1-10-96; C.F. No. 97-1421, § 2, 12-22-97; C.F. No. 98-1055, § 1, 1-6-99; C.F. No. 02-988, § 1, 11-27-02; C.F. No. 03-33, § 3, 2-12-03; C.F. No. 03-889, § 2, 11-5-03; C.F. No. 04-349, § 1, 5-5-04)

Sec. 33.06. Certificate of compliance.

(a) The building official may issue a certificate of compliance for any building or structure in Group R-3 or M occupancies when it is determined that such building or structure complies with the provisions of Chapter 34 of the Saint Paul Legislative Code. The fee required for issuance of a certificate of compliance shall be one hundred thirty-eight dollars ($138.00) for a single-family dwelling and one hundred seventy-two dollars ($172.00) for a two-family dwelling.

(b) The building official may issue a certificate of compliance for any building or structure in Group R-1 occupancy, as defined in the Minnesota State Building Code, when it is found that such building or structure complies with the provisions of Chapter 34 of the Saint Paul Legislative Code. This fee, in addition to the certificate of occupancy fee, shall be two hundred seven dollars ($207.00) for a three-family dwelling, two hundred forty-one dollars ($241.00) for a four-family dwelling, and fourteen dollars ($14.00) per unit for a five- or more family dwelling with a minimum of two hundred seventy-five dollars ($275.00) and a maximum of four hundred thirteen dollars ($413.00).

(c) There shall be no fee charged for the issuance of a certificate of compliance for new buildings at the completion of their

construction covered by a building permit.

(d) The building official may, without further inspection, issue a certificate of compliance for any building or structure which has been issued a rental dwelling unit registration certificate, which issuance was based on an inspection under Chapter 51 of the Legislative Code, within the previous twelve-month period.

(Code 1956, § 25.08; Ord. No. 17250, § 9, 6-13-85; Ord. No. 17589, § 1, 9-13-88; C.F. No. 99-272, § 3, 5-12-99; C.F. No. 03-33, § 4, 2-12-03; C.F. No. 03-889, § 3, 11-5-03)

Sec. 33.07. Fences--Requirements.

(a) *Permit.* No person shall construct, or cause to be constructed, any fence in the City of Saint Paul without first obtaining a permit therefor from the building official.

(b) *Height of fences.* No fence shall be erected exceeding six (6) feet six (6) inches in height above the sidewalk or finished grade of any lot in a residence district or on any lot occupied for residential purposes. Fences and all supporting structures shall be completely within the boundaries of such lot. All fences erected between the front property line and the front setback line as defined in section 60.206 of the Saint Paul Legislative Code shall be no more than four (4) feet in height. The selvage end of chain link or metal fences shall be smooth; knuckled ends are permitted, twisted ends are not permitted. No fence, wall, shrubbery, sign or other obstruction to vision above a height of two (2) feet from the average grade of any street right-of-way lines by a straight line drawn between said right-of-way lines at a distance along each line equal to the minimum setback lines from their point of intersection. Fences for nonresidential uses in residential zoning districts shall not exceed eight (8) feet in height, except fences around tennis courts, which shall not exceed twelve (12) feet in height, back stop fences, which shall not exceed twenty (20) feet in height, and golf range fences, which shall not exceed thirty (30) feet in height.

(c) *Variances.* A variance of the fence height regulations may be granted if, after investigation by the building official, it is found that site, or terrain, or nuisance animal conditions warrant a waiver of the height restrictions. An application fee of twenty-five dollars ($25.00) is required for each variance request.

(d) *Swimming pool fences.* All yards of one- and two-family structures containing swimming pools shall be enclosed by an obscuring fence not less than four (4) feet in height. All yards of residential structures of three (3) or more units and commercial structures containing swimming pools shall be enclosed by an obscuring fence not less than five (5) feet in height. The gates shall be of a self-closing and self-latching type, with the latch on the inside of the gate, not readily available for children to open. Gates shall be capable of being securely locked when the pool is not in use.

(e) *Barbed wire fences.* No barbed wire fence shall be constructed within the city limits of the City of Saint Paul, except for police and correction facilities, unless the following conditions are complied with:

(1) No fence which uses barbed wire may be built in, or abut, a residentially zoned district or built on or abut a lot occupied residentially.

(2) Barbed wire, not exceeding three (3) strands, may be permitted on the top of a fence; providing, that the arms do not project over public property. The minimum height to the bottom strand of the barbed wire shall not be less than six (6) feet from finished grade.

(3) In all cases where a barbed wire fence is requested, an application shall be made to the building official.

(4) A certificate of insurance indemnifying the City of Saint Paul shall be submitted with the application subject to the approval of the city attorney as to form and in an amount as set forth in Minnesota Statutes, Section 466.04.

(f) *Electric fences.* No aboveground electric fence shall be constructed within the city limits of the City of Saint Paul, except at Como Zoo for the containment of zoo animals.

(Code 1956, § 25.09; Ord. No. 17250, § 10, 6-13-85; C.F. No. 95-936, § 1, 8-30-95; C.F. No. 96-569, § 1, 8-7-96; C.F. No. 99-750, §§ 10, 11, 9-1-99; C.F. No. 02-309, § 1, 6-5-02; C.F. No. 04-289, 4-14-04)

Cross reference(s)--Additional requirements and conditions pertaining to fences are contained in the zoning code. See the index for the location of specific requirements.

Sec. 33.08. Street encroachments.

(a) *Projection beyond street or building line.* Except as otherwise provided in the Minnesota State Building Code, no part of a building hereafter erected or of an enlargement of a building heretofore erected shall project beyond a street line or a building line.

(b) *Insurance.* Any part of a building or structure hereafter erected or of an enlargement of a building heretofore erected which projects beyond fifteen (15) inches into a public right-of-way shall require a certificate of insurance indemnifying the City of Saint Paul in a form approved by the city attorney and in an amount set forth by the risk manager.

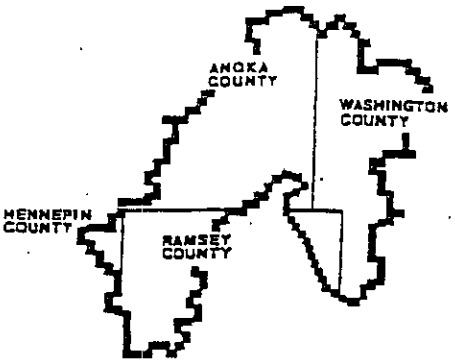
(c) *Types of projections.* This shall include overhanging or projecting roofs, cornices, fixed awnings, canopies or any other permissible projection.

(Code 1956, § 4.07(1), (2); C.F. No. 94-1397, § 1, 10-19-94)

Appendix G

Infiltration Design Guidelines

STORMWATER INFILTRATION GUIDANCE



Published by Rice Creek Watershed District
3585 Lexington Avenue North, Suite 330
Arden Hills, Minnesota 55126-8056
Phone: (651) 766-4191 Fax: (651) 766-4196

INTRODUCTION

This document presents guidance for infiltration practices in the Rice Creek Watershed District. Historically, stormwater management in the District focused on controlling peak runoff rates. However, scientists and engineers now understand the need to also manage the volume of runoff. Management of runoff volume benefits developers, residents, cities, and the natural environment.

Developers benefit from reduced pipe size and cost. Cities and residents benefit from reduced frequency and duration of flooding and improved water quality. This is particularly important in basins with restricted outlets. Controls targeting peak runoff rates may decrease flood stages in these areas, but without volume control, flood inundation is longer and storage volumes fill increasing the risk of flooding from the next rainfall.

The environment benefits because infiltration duplicates "natural" rainfall adsorption mechanisms, better mimics natural groundwater stream baseflow relationships, traps pollutants, slows runoff velocities, sustains base flows, and protects aquatic organisms from high turbulent flows.

The Rice Creek Watershed District's goals with respect to infiltration are straightforward:

- To reduce runoff
- Infiltrate runoff which occurs

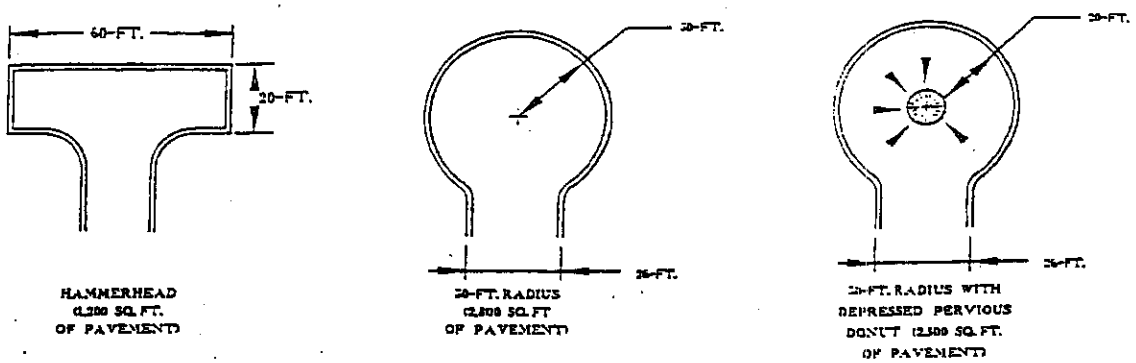
These will be accomplished by:

- Maximizing pervious surfaces and minimizing impervious surfaces from development.
- Retaining the condition of landlocked basins.
- Promoting practices that minimize soil compaction during construction and maximize post-construction infiltration.
- Promoting construction of infiltration Best Management Practices.

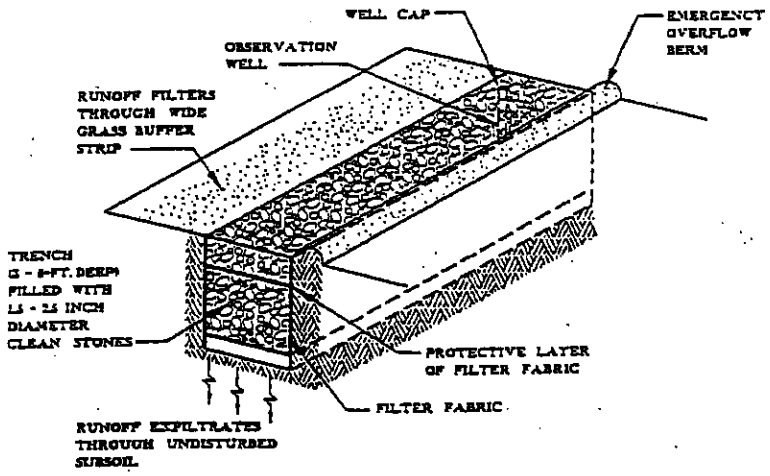
RULES AND REGULATIONS

Development resulting in the creation of impervious surfaces will be required to explicitly address the feasibility of Best Management Practices to <u>first</u> limit the loss of pervious area and <u>second</u>, to infiltrate runoff which occurs from impervious areas.

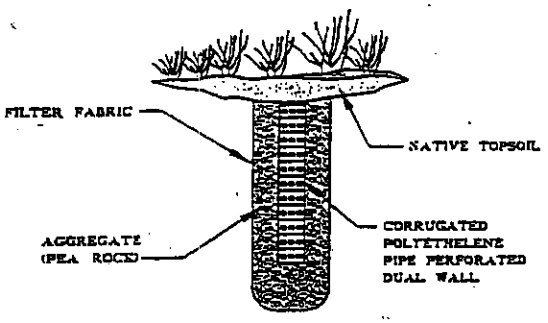
Documentation of the feasibility will need to address the extent to which items in the checklist on the last page of this guide are included or excluded from the final plan.



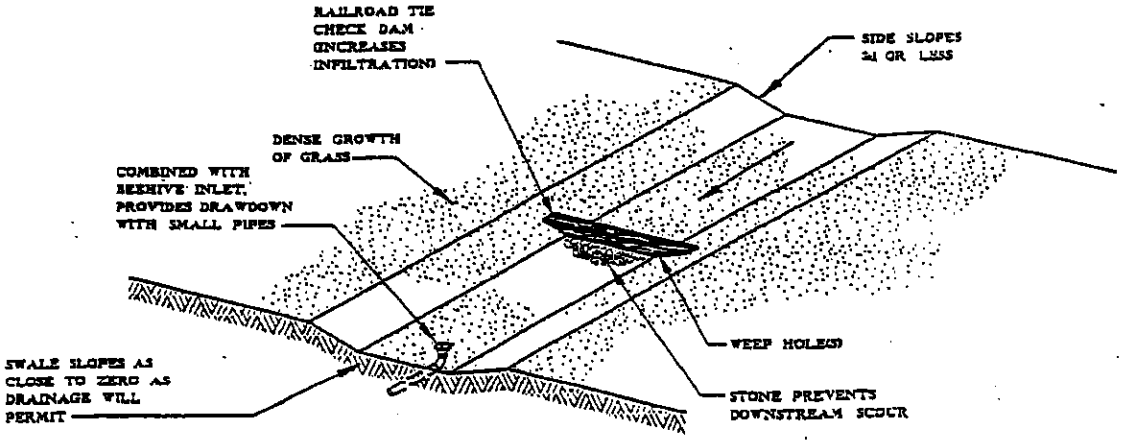
ALTERNATIVE CUL-DE-SAC TURNAROUNDS
(SOURCE: METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS, 1995)



INFILTRATION TRENCH
(SOURCE: SCHUELER, 1995)



INFILTRATION TUBE
(SOURCE: CITY OF MAPLEWOOD)



GRASSED SWALE
(SOURCE: SCHUELER, 1995)

4.60 Filtration Practices: FILTRATION DEVICE WARNINGS

INTRODUCTION

The topic of infiltration can be divided into two categories: management practices and devices. Management practices in this context means reducing impervious surfaces, discharging impervious surfaces over pervious areas, disconnecting roof drains from the storm water system or other measures. These are encouraged and essentially noncontroversial practices. But as noted below, they may require special considerations in industrial areas or other unusual cases.

The other category of activity is called infiltration devices. This is everything from filter strips and swales to large infiltration ponds or infiltration trenches, tubes or other devices that conduct the runoff into the ground. In *most* cases the types of devices that are of most concern are devices that bypass the vados zone and conduct surface runoff directly into the ground. For example, swales and ditches are generally of less concern, while devices that conduct into deep aquifers are generally of greater concern. Note that these are generalizations that need to be evaluated on a site-specific basis. A site analysis should be conducted before implementing infiltration on your project or for your community.

Filtration devices -- especially infiltration devices, such as basins and trenches -- are controversial as BMPs for storm water management. Literature indicates that operation of infiltration devices is a concern for two reasons: (1) failure to operate, and (2) concerns for ground water contamination. These concerns are made greater or diminished depending on site circumstances, and must be compared to the benefits that infiltration can provide for reducing stormwater flows in surface waters and replenishing ground water through recharge. Therefore, infiltration devices should be used only after thorough, site-specific evaluation of these concerns and of the pros and cons of other stormwater management options. Infiltration should also be used in conjunction with other measures, such as avoidance and pretreatment practices to protect ground water quality and the function of the infiltration device. Sound judgment; good design, including a detailed site evaluation; and proper construction techniques should alleviate the operational problems with these systems.

RESTRICTIONS

Class 5 wells. Under federal laws, "Class 5 wells," which are essentially any storm water infiltration device that is deeper than it is wide, are required to be inventoried by reporting to the EPA and the MPCA. There are no other regulations at the present time, but future regulation is anticipated.

Minn. R. ch. 7060. Minnesota State laws (M.R.7060) prohibit the direct discharge of untreated storm water to the saturated zone if the discharge threatens ground water from potential pollutants. There could be liability if it is determined that a discharge has introduced contaminants into ground water in violation of state law. Treatment before infiltration is a suggested means to discourage the possible introduction of pollutants into the ground water.

Wellhead Protection Plans. For stormwater systems located in defined wellhead-protection areas, the local unit of government must develop a "Wellhead Protection Plan" in accordance with state

Infiltration and the Potential for Ground Water Pollution

The potential for ground water pollution is a concern when planning an infiltration device. The effects of infiltration basins on ground water have been studied as part of the Nationwide Urban Runoff Program (NURP). The NURP study was conducted on infiltration basins in the Fresno, California, area and on Long Island, New York. That study found that the soil beneath the basins was effectively trapping the pollutants studied and there was no significant contamination of ground water from the basins.

Because the NURP studies concluded that there was minimal evidence of ground water contamination from the basins, the NURP final report did not recommend any change in the use of those practices (USEPA, 1983). However, this does not mean that ground water cannot be adversely affected by infiltration basins. More recent studies conducted by Robert Pitt and others (Pitt *et al.*, 1994a) discuss the risk of ground water contamination being a function of a compound's relative mobility, concentration and solubility. Pitt suggests guidelines on using infiltration practices along with using adequate pretreatment devices to support infiltration practices.

It is important to consider monitoring the ground water quality and capacity of the infiltration device its long-term operation.

Excluded Discharges

Discharges that should generally be excluded from infiltration devices include construction sites, spills, industrial discharges, and other discharges.

Construction Sites. Construction sites do not generally contain toxics that pose a threat to ground water, but high sediment levels will quickly clog infiltration facilities.

Spills. All reasonable measures should be taken to assure that spills do not enter infiltration areas. Pretreatment ponds with skimmers and shut-off measures are one method of dealing with potential spills.

Industrial Discharges. Untreated storm water from industrial and manufacturing areas has a high potential for elevated concentrations of metals and organic compounds. Industries under the storm water permit program are required, and other industries should be responsible enough, to:

- evaluate sources of potential contamination,
- prevent storm water contact with contaminated areas and where prevention is not possible, and
- treat runoff from their sites.

Other Discharges. Other discharges should be investigated for exclusion. These include potentially illegal discharges, such as dry-weather sewer flows, which could be illegal industrial discharges or combined sewer flows. Heavily salted runoff from streets and parking areas should also be evaluated carefully for potential impacts, since infiltration does not treat high concentrations of chlorides.

runoff has been minimized, infiltration should be considered to reduce the volume of runoff to predevelopment rates.

Pretreatment. Dissolved materials, settleable solids, floating materials and grease and oil should be removed from runoff to the maximum extent feasible before it enters the infiltration device. If these materials enter the device, they can pass through to ground water, or clog the device, take up storage volume, and cause the system to fail. Detention ponds with skimmers, vegetative filters, sand filters, peat sand filters, grassed swales, biofilters, bioretention, filter strips or oil/grit separators are measures that can be used to remove these materials before they enter the infiltration device. It may be feasible to allow limited amounts of these materials to enter the device if their effects are considered during the design. One method of planning for this is to rely upon infiltration out of the sides of the device, or in extended-detention areas of the system, rather than the bottom.

Mitigate Impacts

A mitigation plan should be developed for all reasonably anticipated contingencies. A mitigation plan could involve ground water monitoring, and policies of preparedness for ground water cleanup.

INSTALLATION AND MAINTENANCE

System Design

Bypass. After considering runoff flow and concentration, and the nature of the aquifer, materials that are highly soluble and can impact ground water may need to be kept from being discharged to the infiltration system. The ability to direct contaminated flows so that they bypass infiltration devices may be an important of the system design.

Off-line Systems. Infiltration devices can be constructed as "off-line" systems where a regulated volume of flow is directed from treatment ponds to infiltration devices. High flow volumes would continue to be routed through the treatment ponds but the majority of high flow could be discharged downstream so the infiltration systems are not overloaded.

Professionals should do the hydrologic design of infiltration basins in accordance with accepted and appropriate procedures. Flood routing is recommended for all infiltration devices, and a system of bypasses or overflow devices should be considered.

Water Table and Bedrock Separation

We recommend ***a minimum 3-ft distance should be provided below the bottom of the system and bedrock or the water table.*** Adequate depth to the water table, impeding layers or bedrock is required to prevent a water table mound from intersecting the bottom of the infiltration practice or affecting the hydraulic capacity of the practice. *We recommend that the distance be 10 ft to fractured bedrock because of higher hydraulic conductivity.*

Table 4.60-1 Bioretention and ponds

	Buffer Zone (not a treatment, but performs treatment functions)	Filter Strip	Swales and Enhanced Swales *	Infiltration Basins and Enhanced or Bioretention Basins	Infiltration Trenches	Ponds
Location	Usually adjacent to aquatic systems	Small-volume, low-velocity area	1-3 ft above water table	3 ft above water table, 10 ft above fractured bedrock	3 ft above water table, 10 ft above fractured bedrock	No specific requirements
Pretreatment	No concentrated flow	No concentrated flow	A sediment forebay is desirable	** Sediment and debris removal desired	** Sediment and debris removal desired	No specific requirements
Runoff from 1.25-inch event (water quality volume)	No specific requirement	0.5 ft/sec 0.5 inches Depth 10-minute flow time	Vel ≤ 1.0 ft/sec Depth ≤ 0.5 ft*	Discharge through soil in 24 hours or less	Discharge through soil in 24 hours or less	Outflow rate
Runoff from 1-yr. event ~ 2.4-inch event	No specific requirement	≤ 2 ft/sec	≤ 2 ft/sec $\tau \leq 1$ lb/ft^2	Discharge through soil in 48 hours or less	Provide bypass to other systems	Velocity ≤ 2 ft/sec
Runoff from 2-yr. event ~ 2.8-inch event	No specific requirement	≤ 3 ft/sec.	≤ 3 ft/sec $\tau \leq 1.5$ lb/ft^2	Discharge through soil in 72 hours or less	Provide bypass to other systems	Velocity ≤ 3 ft/sec. Discharge rate ≤ 50% of the predevelopment rate
Runoff from 10-yr. event ~ 4.0-inch event	No specific requirement	≤ 5 ft/sec	≤ 5 ft/sec $\tau \leq 2.5$ lb/ft^2	Provision for bypass at high flows	Provide bypass to other systems	Velocity ≤ 5 ft/sec and Discharge rate = predevelopment
Runoff from 100-yr. event ~ 6.0-inch event	No specific requirement	≤ 5 ft/sec	≤ 5 ft/sec $\tau \leq 2.5$ lb/ft^2	Provision for bypass at high flows	Provide bypass to other systems	Velocity ≤ 5 ft/sec and Discharge rate = predevelopment

* For enhanced swales, insert retaining dikes to retain water quality volume of runoff behind filter dikes.

** No industrial or highly contaminated sources without appropriate pretreatment.

τ = shear stress

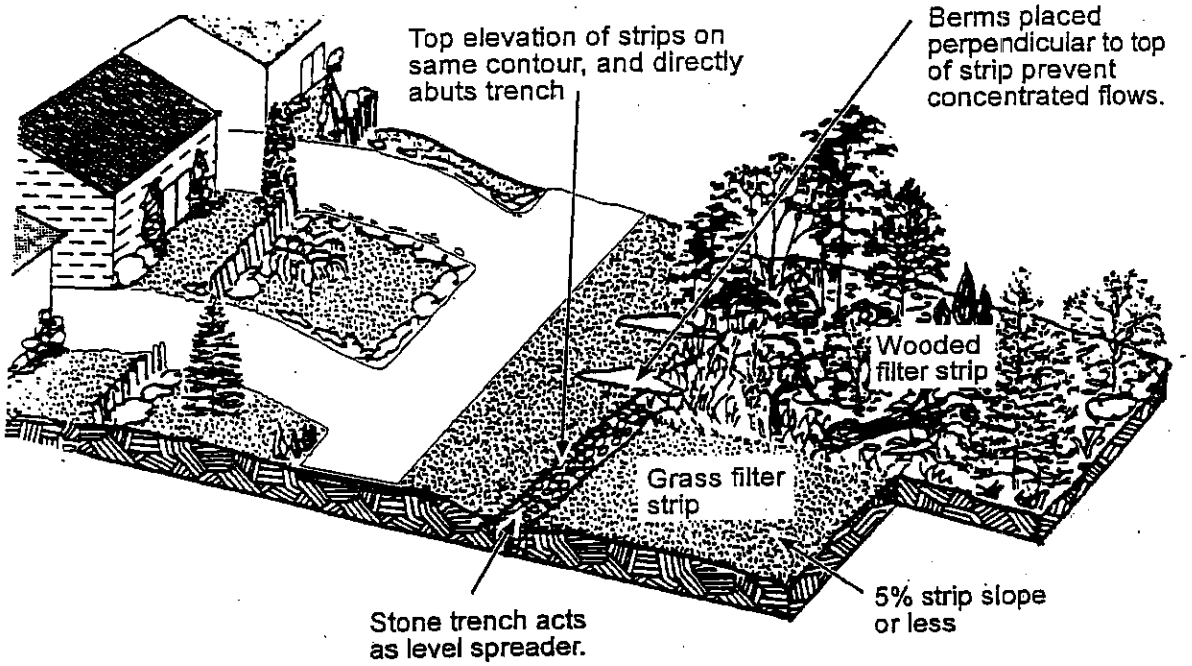


Figure 4.61-1 Schematic of a grassed-and-wooded filter strip (source: Schueler, 1987)

Existing perennial vegetation next to receiving waters may provide wildlife benefits but not significant pollutant-reduction benefits, depending on ground cover and runoff type. However, buffer areas provide valuable habitat and they should be maintained. Consideration should be given to buffer zone preservation as part of the design of the filter system.

Waterways should have filter strips on both sides to be effective as part of a filter system. An intermittent waterway itself may also provide filtering benefits if adequately vegetated (see part 4.62, Vegetated Swales).

DESIGN RECOMMENDATIONS

Measures to help prevent concentrated flows (Claytor, December 1996):

- The width of the filter should generally be measured perpendicular to the overland flow, and equal to the width of the treated drainage area
- The flow length through the filter system should be a minimum of 25 ft and at maximum no more than 300 ft. The slope of the filter should be limited to about 2 to 6%.
- The flow length of the drainage area to be treated is usually limited to 75 ft for impervious areas or 150 ft for pervious areas.

Filter strips should generally be on the contour and designed to pass the 1.25-inch, 24-hour water quality storm event at a flow depth of about 0.5 inch, and a velocity of 0.5 feet per second (fps).

Forested Filter Strips

In urban areas, you can have trees and forests serve as filters and should not be destroyed to create filters or other water-quality-enhancing features. Some urban forests can be managed to more effectively act as a filter, or part of a filter system. Urban forest areas can be maintained as a buffer or as a filter without destroying the multiple benefits of habitat and water quality that forests provide.

Filter strips that include a forest component are intended to protect water quality by preserving the filtering capacity of the soil and surface vegetation. Forest leaf litter encourages infiltration, while the canopy protects the soil from impacts of direct rainfall. The forest also provides shade, which can prevent thermal effects of human activity, especially near streams and running water.

Forested filter strips are similar to, but not the same as, buffer zones. Forested filters are managed to perpetuate vegetation along aquatic areas, which helps to promote habitat and water-quality protection, especially for temperature. They are not natural areas, but they are managed for perpetuation of shade and habitat benefits. Management is allowed in these areas to promote continuous growth of shade-tolerant vegetation.

Mixed Filters

Filter strips can be planted to grasses or woody vegetation. Species selected for filter strips must be adapted to the soil and site conditions. Because of the multiple benefits to habitat, water, quality, and aesthetics, filter strips with a variety of vegetation types are often preferred.

Soils and ground cover in natural forest areas can provide effective treatment, but in disturbed areas, the ground vegetation, such as grasses, is critical to the treatment process. The vegetative ground cover can often be enhanced in forested areas to improve treatment rather than destroying the forest vegetation.

Native grasses are often best suited when biodiversity, upland habitat and pollutant filtering are objectives. Native grasses develop an extensive root system, but may take several years to become adequately established.

Cutting and harvesting forest and other native vegetation may not be beneficial or needed in most cases. However, cutting and harvest of vegetation for disease control or other management may be desirable.

INSTALLATION, OPERATION AND MAINTENANCE

Installation

Appropriate soil-stabilization methods, such as mulch, mats or blankets, should be used before establishment of vegetation.

Seeding, sodding and other items related to establishing vegetation should be in accordance with accepted erosion-control and planting practices.

4.62 Filtration Practices: VEGETATED SWALES

DESCRIPTION AND PURPOSE

Definition

"Grassed swales" (see Figure 4.62-1) or "vegetated swales" (Figure 4.62-2) are earthen conveyance systems in which pollutants are removed from urban storm water by filtration through the grass and infiltration through the soil. The primary purpose of these structures is often conveyance, but they differ from conveyance channels because water-quality and quantity benefits are part of the design considerations.

Enhanced vegetated swales, or biofilters, utilize check dams and wide depressions and off- channel retention areas to increase runoff storage and promote greater settling of pollutants.

Purposes

Vegetated swales may be applied as part of a resource-management system to:

- convey water in properly protected channels.
- divert water around potential pollutant sources.
- provide infiltration to reduce total surface water runoff volumes.
- pretreat runoff prior to discharge to another treatment system (for example, an infiltration basin or trench).
- reduce sediment and other pollutants in runoff.
- enhance biological diversity by creating habitat between upland and surface waters.

PLANNING CONSIDERATIONS

Vegetated swales are most applicable in residential or institutional areas where the percentage of impervious cover is relatively small. Swales are usually located in a drainage easement at the back or side of a residential lot. They can also be used along roads in place of curb and gutter. In planning the drainage system for a development, the planner should consider the following characteristics of vegetated swales:

1. Vegetated swales are generally less expensive to install than curb and gutter.
2. Roadside swales keep flow away from the street surface during storms, thus reducing driving hazards.
3. Roadside swales become less feasible as the number of driveway entrances requiring culverts increases.
4. In areas with steep slopes, vegetated swales are best suited to locations where they can be parallel to the contours.

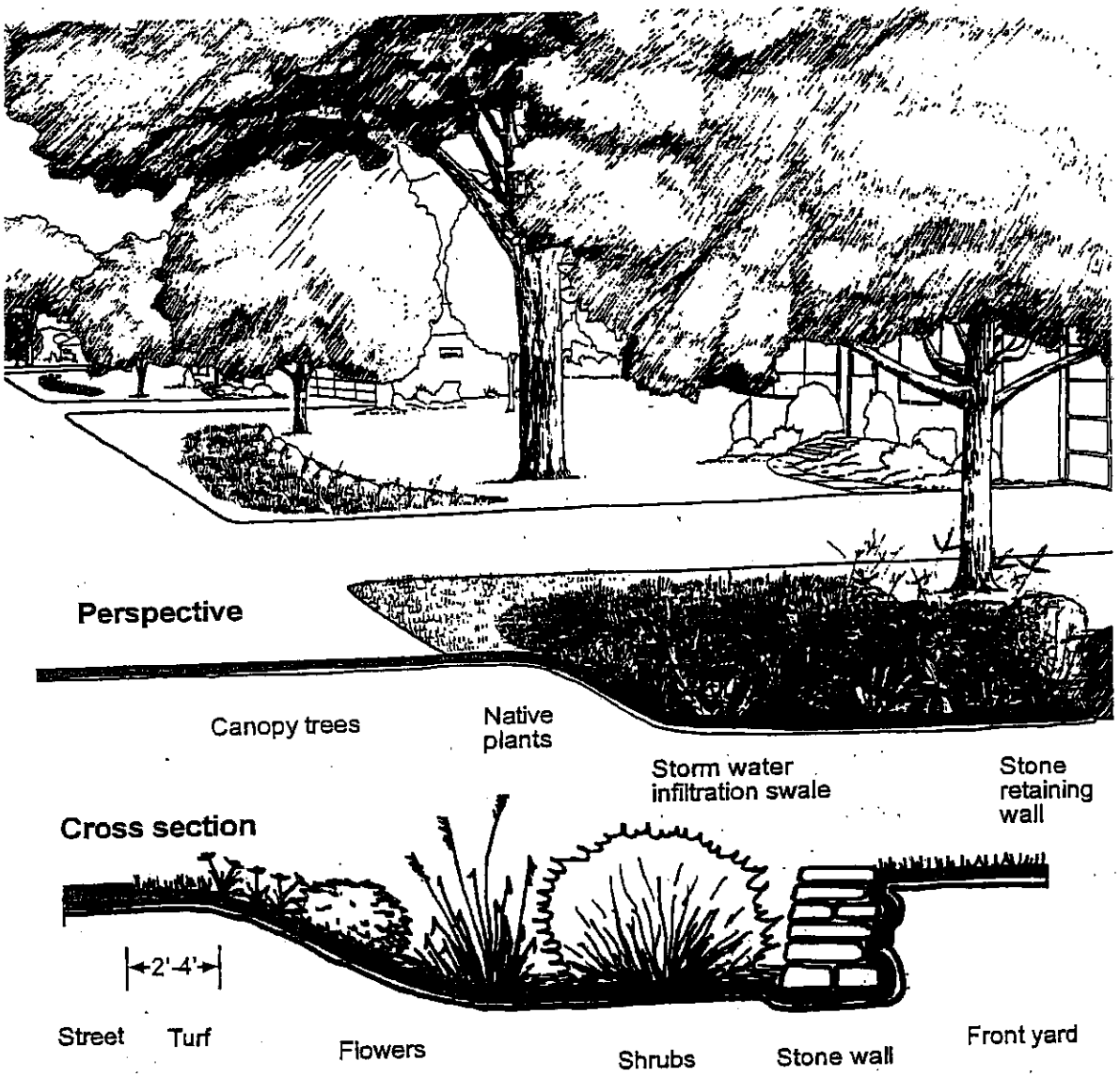


Figure 4.62-2 Asymmetrical high-volume swale with front yard defined by masonry wall (Nassauer *et al.*, 1997)

Without enhancement, higher flows will not be treated to any significant extent. The use of enhancements, channel lining and conveyance channel design features should be included to convey and treat higher flows.

Provisions should be made for removing settled solids from the channel as necessary to maintain proper functioning. A sediment forebay is desirable to facilitate ease of maintenance.

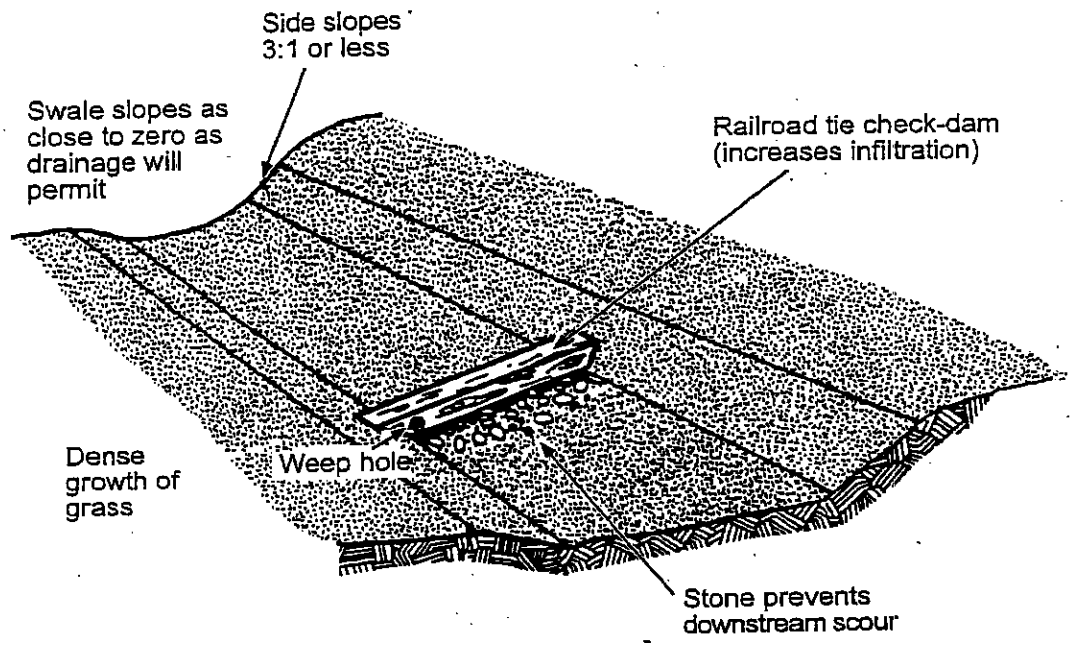


Figure 4.62-3 Schematic of an enhanced grassed swale (source: Schueler, 1987)

Native grasses, such as bluestem and brome, are best suited when biodiversity, upland habitat and pollutant filtering are objectives. Native grasses develop an extensive root system, but may take several years to become adequately established.

Appropriate soil-stabilization methods, such as mulch, mats or blankets, should be used before establishment of vegetation.

Seeding, sodding and other items related to establishing vegetation should be in accordance with accepted erosion-control and planting practices. Desirable vegetative characteristics include species that form a dense sod with vigorous, upright growth. Species that have tendencies to mat down should not be used when sediment filtering is a desired outcome.

Species selected for filter strips should be adapted to the soil and site conditions. Information on plant species suitability to site conditions is available from the Natural Resources Conservation Service and the University of Minnesota Extension Service.

Annual cutting of the swales in the first few years of establishment is important. This promotes dense sod formation and helps maintain vigor of most plant species. Stubble of 4 to 8 inches is usually high enough to promote rapid and adequate regrowth.

4.63 Filtration Practices: INFILTRATION BASINS

DESCRIPTION AND PURPOSE

An infiltration basin is a stormwater impoundment that does not contain a permanent pool of water because it has permeable soils. The inflow volume must be controlled so that the treatment volume can be discharged through the soil. The purpose of the basin is to temporarily store surface runoff for a specific design frequency storm and allow it to infiltrate through the bottom and sides of the basin. This infiltration removes many pollutants, provides ground water recharge, reduces the volume of runoff, and reduces peak discharges.

Target Pollutants

Infiltration basins are very effective for removing fine sediment, trace metals, nutrients, bacteria, and oxygen-demanding substances. Coarse sediment is effectively controlled, but should be removed from runoff before it enters an infiltration basin. Coarse sediment can clog the basin and take up storage volume. Dissolved pollutants are effectively controlled for storm events less than the design frequency, but these materials may not be removed from the runoff as it infiltrates, creating a potential ground-water problem.

Effectiveness

Infiltration basins have been designed to infiltrate a design runoff volume. For storms larger than the design storm, effectiveness will be reduced, but will be similar to those reported for detention ponds of similar size. Although infiltration basins are very effective for controlling pollutants in surface water, using infiltration as primary treatment can reduce the infiltration rate by clogging, and some soluble substances can be expected to move to the ground water. Chloride from road salt is an example of a soluble material that will not be removed during the infiltration process.

PLANNING CONSIDERATIONS

Note the caveats and warnings about infiltration devices in section 4.60.

Infiltration basins are best suited for sites with drainage areas of two to 15 acres. A typical basin will have a depth of 3 to 12 ft. The maximum depth of a basin is limited by the infiltration rate of the soil and maximum detention time. Figure 4.63-1 depicts a typical infiltration basin.

The soils on a prospective site are an important consideration when determining the suitability for infiltration. The soils should generally have an infiltration rate of between 1.0 inch and 6.0 inches per hour to be considered for an infiltration basin. Although any site can be designed to provide some infiltration by limiting the loading rate beyond these infiltration rates, special consideration may be required. Soil surveys are useful for preliminary screening of a site for soil infiltration rate. However, a geologic investigation of the specific site is required for design of an infiltration basin. The borings or trenches used for the geologic investigation should extend at least 5 ft below the bottom of the proposed basin.

Water Table and Bedrock Separation

A minimum 3-ft distance should be provided below the bottom of the system and bedrock or the water table (For fractured bedrock, separations up to 10 ft may be required, or denial of the infiltration option may be the only reasonable alternative). This minimum separation distance is required to trap or treat pollutants before they reach ground water or bedrock and to maintain vegetation in the basin. In addition to removing pollutants, the separation to water table is required for basin hydrologic operation.

Site Sensitivity Analysis

Before an infiltration system can be designed, a site sensitivity analysis must be performed. This evaluation may eliminate an infiltration practice from consideration because of potential effects on ground water. Because of varying geologic settings, a site evaluation needs to be tailored to the specific site conditions. A team approach to this evaluation is recommended where various disciplines such as engineering, hydrogeology and soil science are represented.

When performing a site evaluation, the following items should be considered.

- **Runoff water quality.** If runoff water will contain significant concentration of soluble pollutants that can contaminate ground water, an infiltration basin should not be used.
- **Degree of detail.** Determine how much detail will be required for the study. For instance, a small structure receiving runoff from a residential roof top will not require as much detail as a structure serving a larger area and having a higher potential pollutant load.
- **Geologic (ground water) sensitivity.** A site with a highly sensitive geology, such as one with a carbonate or surficial sand aquifer, may eliminate this practice from consideration.
- **Depth to water table.** The water table must be far enough below the bottom of the infiltration basin to allow the structure to function hydraulically and to allow trapping and treatment of pollutants by the soil.
- **Soil permeability.** Permability of the soil must be great enough to drain the structure in a reasonable amount to time, generally 24 hours or less.
- **Soil characteristics.** Evaluate the soil's ability to trap or treat pollutants expected at the given site and also provide the required infiltration rate.

These are a few of the major consideration involved in a site sensitivity analysis. For a more detailed discussion, the reader is directed to "Evaluation Techniques for Large Drainfield/Mound Systems Under Varying Geologic Settings," by J. A. Magner, in *Proceedings of the Fourth National Symposium on Individual and Small Community Sewage Systems* (Magner, 1985).

OPERATION AND MAINTENANCE

Runoff Filtering

Settleable solids, floating materials and grease should be removed from runoff to the maximum extent possible before it enters the infiltration basin. If these materials enter the basin, they can clog the bottom of the basin, take up storage volume and cause the system to fail. Devices, such as detention ponds, vegetative filters, sand filters, peat sand/compost filter, grassed swale, biofilters,

Maintenance

Proper maintenance of infiltration basins and their pretreatment devices is critical. Basins and pretreatment devices should be maintained with a regular inspection schedule and a regular maintenance schedule. Sediment accumulation is greatest with the most efficient of infiltration devices. Therefore, it is most important to regularly inspect and maintain these systems to maximize their efficiency and longevity. Sediment removal within the basin should be performed when the sediment is dry enough so that it is cracked and readily separates from the basin floor.

Vegetation should be maintained as needed to control weed growth and maintain the health of the grass. Maintenance includes mowing and fertilization. The use of low-maintenance and drought-resistant varieties will minimize maintenance needs. When fertilizer is needed to maintain the vegetation, proper application methods should be used to minimize the potential for leaching. Split applications and use of slow-release fertilizers will help to minimize the chance of leaching.

RELATED ISSUES

Peat-sand filters are a variation of infiltration basins that show promise for treating urban runoff. A peat-sand filter consists of a bed of a peat-sand mixture, which is constructed over a drainage system. The drainage system collects treated runoff and discharges it back to surface waters. This type of filter is very effective for removal of suspended solids and associated pollutants. Preliminary studies have also found that peat-sand filters remove about 70% of phosphorus from runoff (Farnham and Noonan, 1988). These systems are still in the experimental stage at this time. For new approaches to sand and peat-sand filtration designs, refer to Schueler (1994a).

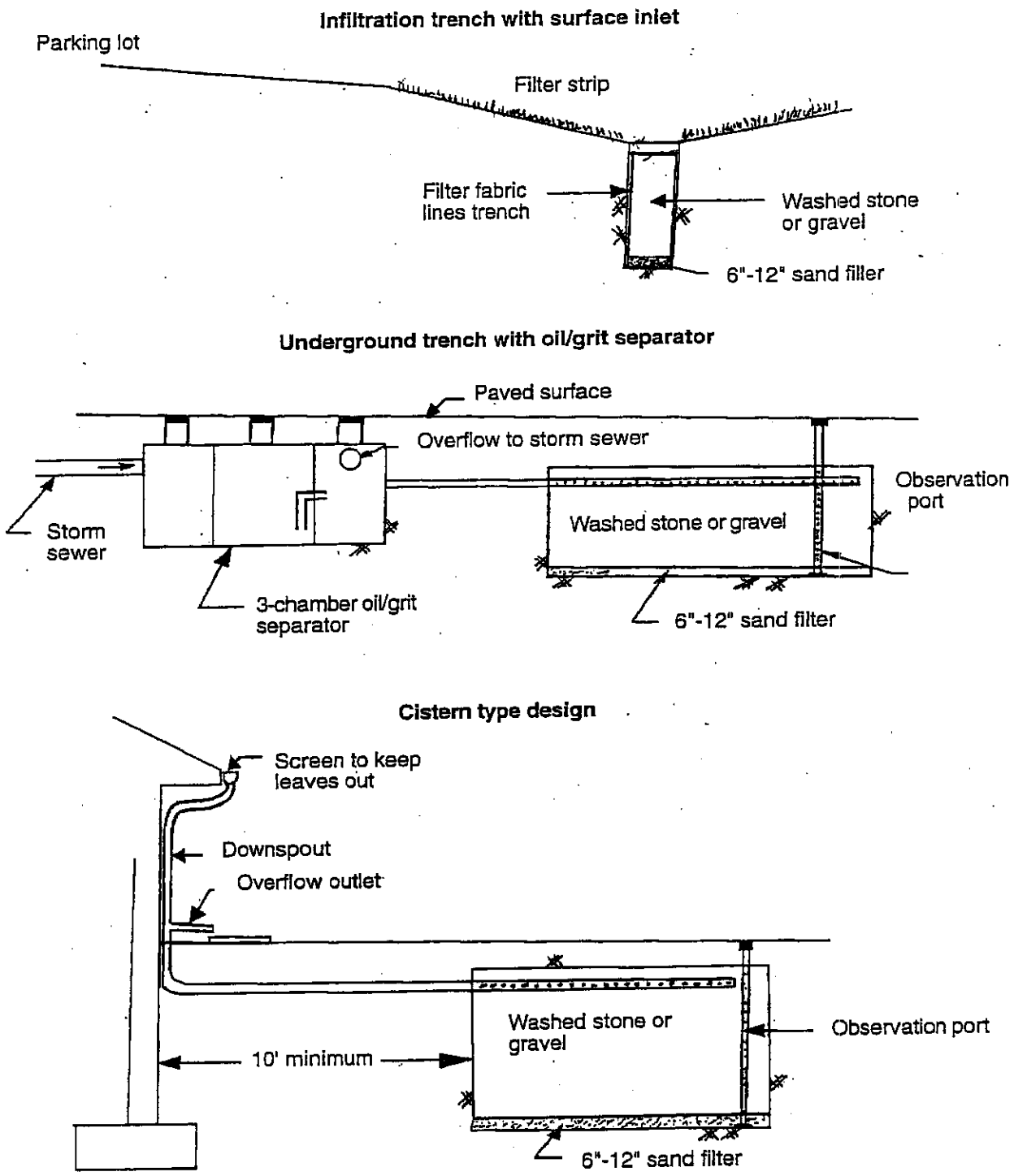


Figure 4.64-1 Schematic designs for infiltration trenches

Trench construction

Construction of infiltration trenches should be delayed until the entire site is stabilized. This will prevent clogging of the trench from high sediment loads during construction.

After the trench has been excavated, its sides and bottom should be lined with filter fabric to prevent intrusion of soil into the stone. Clean, washed 1- to 3-inch stones should be placed in the trench in lifts and lightly compacted with plate compactors.

It is recommended that an observation port be installed in each trench. In addition to monitoring the performance of the trench, a port helps mark the trench location. Trench performance can be monitored by inserting a dipstick in the port immediately after a storm and then each 24 hours until the trench is empty.

After the trench is constructed, surface inlets to the trench should be protected from sediment until the site is stabilized and vegetative filtering practices are fully established.

MAINTENANCE

Proper maintenance of infiltration trenches and their pretreatment devices is critical to the success and longevity of the infiltration device. A regular inspection schedule and a regular maintenance schedule should be implemented. Routine maintenance for infiltration trenches involves activities intended to prevent clogging of the trench. Grass clippings and leaves must be removed from surface trenches to prevent clogging also. The trench should be inspected after the first few runoff events and then at least annually thereafter. It should also be inspected after major storms to check for ponding, which may indicate a clogged trench. Water levels in the observation port can be recorded over a several-day period to check for clogging.

If an infiltration trench becomes clogged, rehabilitation can be very expensive. Clogging in trenches open to the surface occurs most often at the top of the trench. This problem can be corrected by replacing the filter material and filter fabric at the top of the trench.

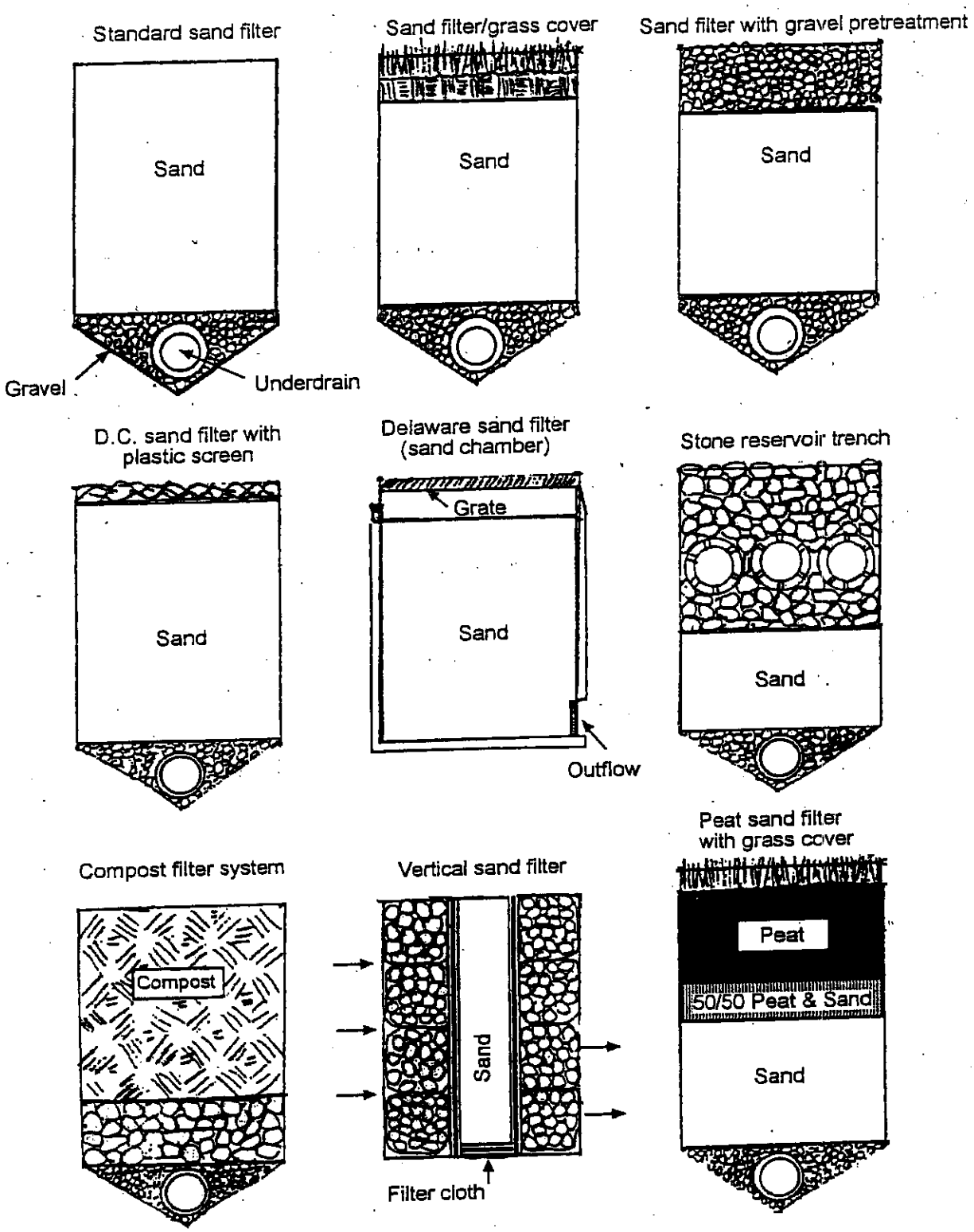


Figure 4.65-1 Cross section of sand filter design variations (source: Schueler, 1994a)

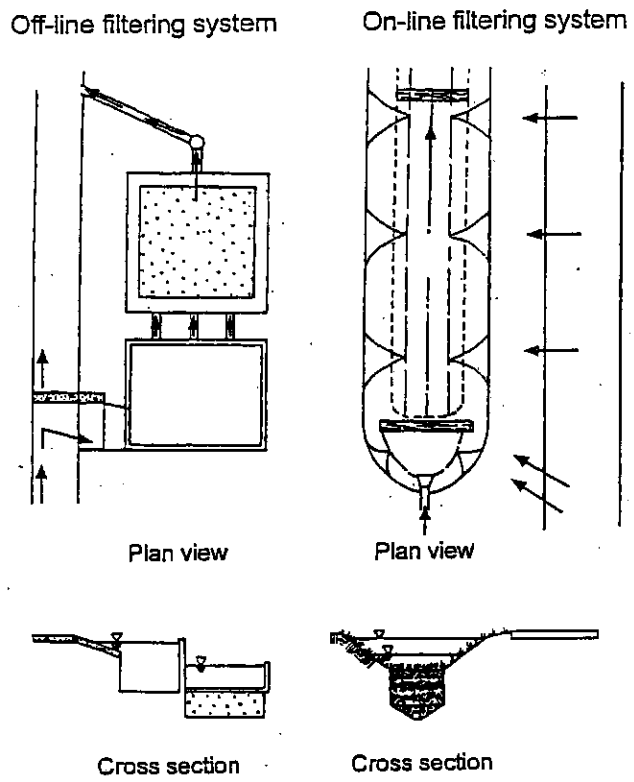


Figure 4.65-2 Schematic: on-line vs. off-line design

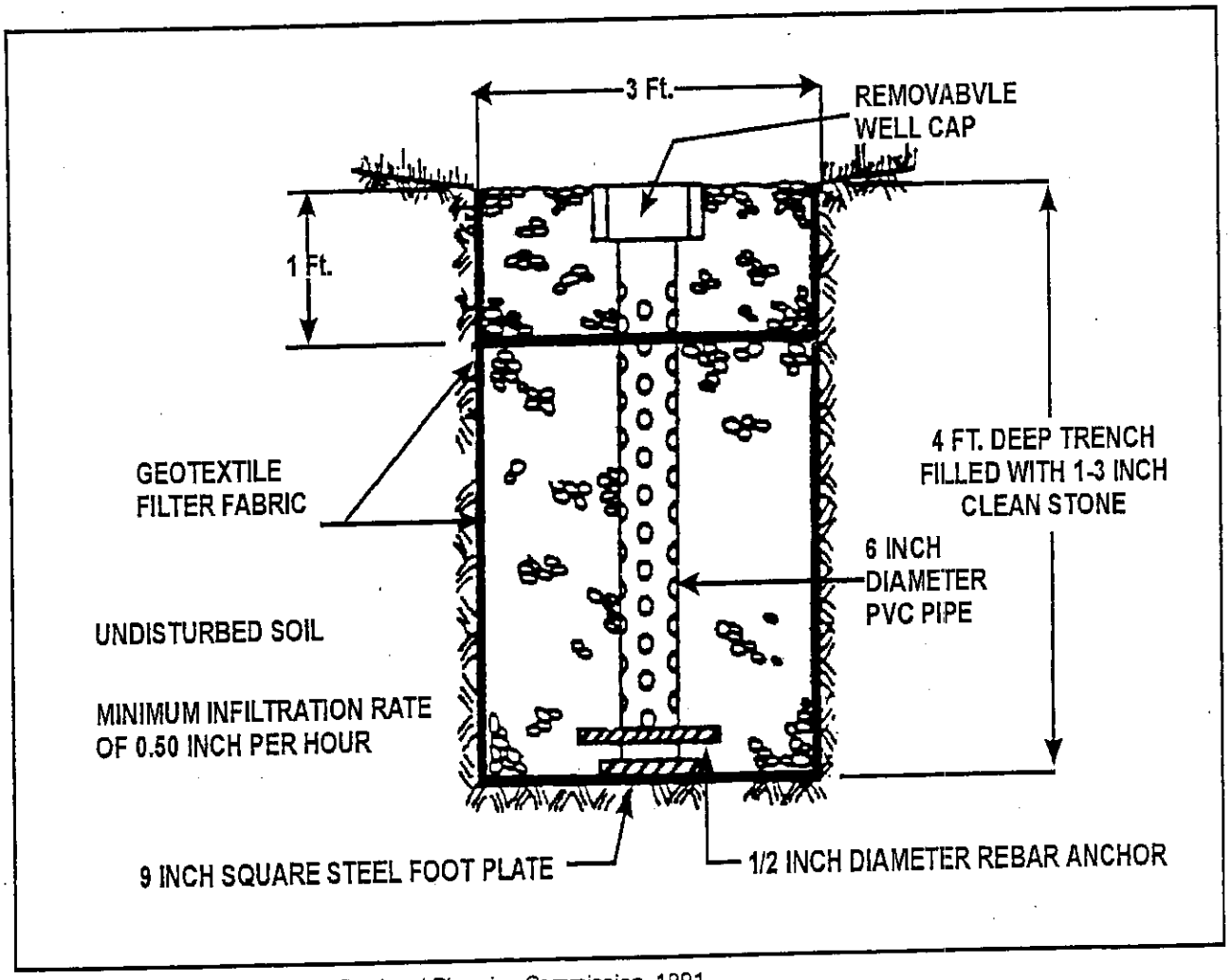
United States Environmental Protection Agency
Office of Water Washington, D.C.
EPA 832-F-99-019 September 1999

EPA

Storm Water Technology Fact Sheet
Infiltration Trench

DESCRIPTION

Urban development is significantly increasing surface runoff and contamination of local watersheds. As a result, infiltration practices, such as infiltration trenches, are being employed to remove suspended solids, particulate pollutants, coliform bacteria, organics, and some soluble forms of metals and nutrients from storm water runoff. As shown in Figure 1, an infiltration trench is an excavated trench, 0.9 to 3.7 meters (3 to 12 feet) deep, backfilled with a stone aggregate, and lined with filter fabric. A small portion of the runoff, usually the first flush, is diverted to the infiltration



Source: Southeastern Wisconsin Regional Planning Commission, 1991.

FIGURE 1 TYPICAL INFILTRATION TRENCH

trench, which is located either underground or at grade. Pollutants are filtered out of the runoff as it infiltrates the surrounding soils. Infiltration trenches also provide groundwater recharge and preserve baseflow in nearby streams.

APPLICABILITY

Infiltration trenches are often used in place of other Best Management Practices where limited land is available. Infiltration trenches are most widely used in warmer, less arid regions of the U.S. However, recent studies conducted in Maryland and New Jersey on trench performance and operation and maintenance have demonstrated the applicability of infiltration trenches in colder climates if surface icing is avoided (Lindsey, et al, 1991).

Infiltration trenches capture and treat small amounts of runoff, but do not control peak hydraulic flows. Infiltration trenches may be used in conjunction with another Best Management Practice (BMP), such as a detention pond, to provide both water quality control and peak flow control (Harrington, 1989). Figure 2 is an example of such a combined technology. This type of infiltration trench has a concentrated input, as opposed to dispersed input (as shown in Figure 1). This system stores the entire storm water volume with the water quality (BMP) volume connected to the infiltration system. This is commonly achieved with a slow release of the storm water management volume through an orifice set at a specified level in the storage facility. As a result the BMP water quality volume will equal the storm water detention area below the orifice level which must infiltrate to exit.

Runoff that contains high levels of sediments or hydrocarbons (oil and grease) that may clog the trench are often pretreated with other BMPs. Examples of some pretreatment BMPs include grit chambers, water quality inlets, sediment traps, swales, and vegetated filter strips (SEWRPC, 1991, Harrington, 1989).

ADVANTAGES AND DISADVANTAGES

Infiltration trenches provide efficient removal of suspended solids, particulate pollutants, coliform bacteria, organics and some soluble forms of metals and nutrients from storm water runoff. The captured runoff infiltrates the surrounding soils and increases groundwater recharge and baseflow in nearby streams.

Negative impacts include the potential for groundwater contamination and a high likelihood of early failure if not properly maintained.

As with any infiltration BMP, the potential for groundwater contamination must be carefully considered, especially if the groundwater is used for human consumption or agricultural purposes. The infiltration trench is not suitable for sites that use or store chemicals or hazardous materials unless hazardous and toxic materials are prevented from entering the trench. In these areas, other BMPs that do not interact with the groundwater should be considered. The potential for spills can be minimized by aggressive pollution prevention measures. Many municipalities and industries have developed comprehensive spill prevention control and countermeasure (SPCC) plans. These plans should be modified to include the infiltration trench and the contributing drainage area. For example, diversion structures can be used to prevent spills from entering the infiltration trench.

Because of the potential to contaminate groundwater, extensive site investigation must be undertaken early in the site planning process to establish site suitability for the installation of an infiltration trench. The use of infiltration trenches may be limited by a number of factors, including type of native soils, climate, and location of groundwater tables. Site characteristics, such as excessive slope of the drainage area, fine-particled soil types, and proximate location of the water table and bedrock, may preclude the use of infiltration trenches. The slope of the surrounding area should be such that the runoff is evenly distributed in sheet flow as it enters the trench unless specifically designed for concentrated input. Generally, infiltration trenches are not suitable for areas with relatively impermeable soils containing clay and silt

or in areas with fill. The trench should be located well above the water table so that the runoff can filter through the trench and into the surrounding soils and eventually into the groundwater. In addition, the drainage area should not convey heavy levels of sediments or hydrocarbons to the trench. For this reason, trenches serving parking lots must be preceded by appropriate pretreatment such as an oil-grit separator. This measure will make effective maintenance feasible. Generally, trenches that are constructed under parking lots must provide access for maintenance.

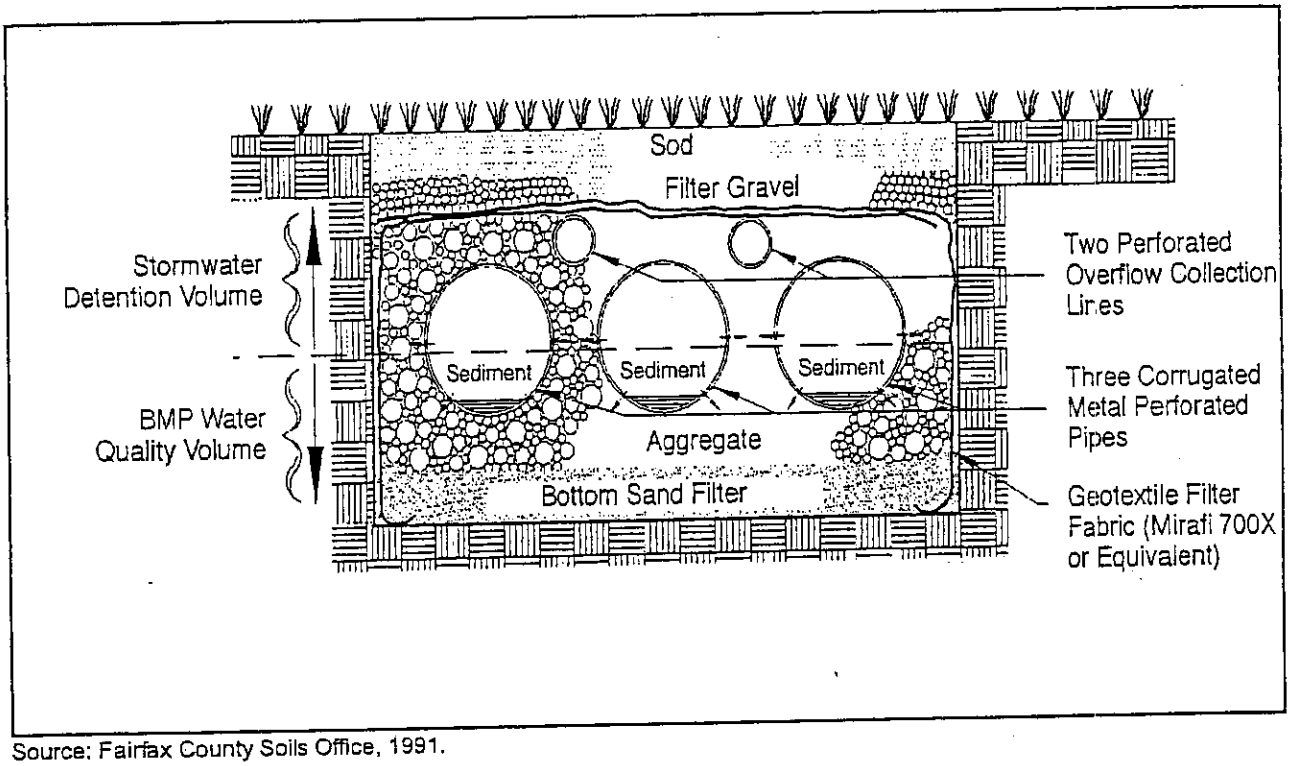
An additional limitation on use of infiltration trenches is the climate. In cold climates, the trench surface may freeze, thereby preventing the runoff from entering the trench and allowing the untreated runoff to enter surface water. The surrounding soils may also freeze, reducing infiltration into the soils and groundwater. However, recent studies indicate that if properly designed and maintained, infiltration trenches can operate effectively in colder climates. By keeping the trench surface free of compacted snow and ice, and by ensuring that part of the trench is constructed below the frost line, the performance of the infiltration trench during cold weather will be greatly improved.

Finally, there have been a number of concerns raised about the long term effectiveness of infiltration trench systems. In the past, infiltration trenches have demonstrated a relatively short life span, with over 50 percent of the systems checked having partially or completely failed after 5 years. A recent study of infiltration trenches in Maryland (Lindsey et al., 1991) found that 53 percent were not operating as designed, 36 percent were partially or totally clogged, and another 22 percent exhibited slow filtration. Longevity can be increased by careful geotechnical evaluation prior to construction and by designing and implementing an inspection and maintenance plan. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration trench. Pretreatment structures, such as a vegetated buffer strip or water quality inlet, can increase longevity by removing sediments, hydrocarbons, and other materials that may clog the trench. Regular maintenance, including the replacement of clogged aggregate, will also increase the effectiveness and life of the trench.

DESIGN CRITERIA

Prior to trench construction, a review of the design plans may be required by state and local governments. The design plans should include a geotechnical evaluation that determines the feasibility of using an infiltration trench at the site. Soils should have a low silt and clay content and have infiltration rates greater than 1.3 centimeters (0.5 inches) per hour. Acceptable soil texture classes include sand, loamy sand, sandy loam and loam. These soils are within the A or B hydrologic group. Soils in the C or D hydrologic groups should be avoided. Soil survey reports published by the Soil Conservation Service can be used to identify soil types and infiltration rates. However, sufficient soil borings should always be taken to verify site conditions. Feasible sites should have a minimum of 1.2 meters (4 feet) to bedrock in order to reduce excavation costs. There should also be at least 1.2 meters (4 feet) below the trench to the water table to prevent potential ground water problems. Trenches should also be located at least 30.5 meters (100 feet) upgradient from water supply wells and 30.5 meters (100 feet) from building foundations. Land availability, the depth to bedrock, and the depth to the water table will determine whether the infiltration trench is located underground or at grade. Underground trenches receive runoff through pipes or channels, whereas surface trenches collect sheet flow from the drainage area.

In general, infiltration trenches are suitable for drainage areas up to 4 hectares (10 acres) (SEWRPC, 1991, Harrington, 1989). However, when the drainage area exceeds 2 hectares (5 acres), other BMPs should be carefully considered. The drainage area must be fully developed and stabilized with vegetation before constructing an infiltration trench. High sediment loads from unstabilized areas will quickly clog the infiltration trench. Runoff from unstabilized areas should be diverted away from the trench into a construction BMP until vegetation is established.



Source: Fairfax County Soils Office, 1991.

FIGURE 2 INFILTRATION TRENCH WITH CONCENTRATED INPUT AND AUGMENTED PIPE STORAGE

The drainage area slope determines the velocity of the runoff and also influences the amount of pollutants entrained in the runoff. Infiltration trenches work best when the upgradient drainage area slope is less than 5 percent (SEWRPC, 1991). The downgradient slope should be no greater than 20 percent to minimize slope failure and seepage.

The trench surface may consist of stone or vegetation with inlets to evenly distribute the runoff entering the trench (SEWRPC, 1991, Harrington, 1989). Runoff can be captured by depressing the trench surface or by placing a berm at the down gradient side of the trench.

The basic infiltration trench design utilizes stone aggregate in the top of the trench to promote filtration; however, this design can be modified by substituting pea gravel for stone aggregate in the top 0.3 meter (1 foot) of the trench. The pea gravel improves sediment filtering and maximizes the pollutant removal in the top of the trench. When the modified trenches become clogged, they can generally be restored to full performance by removing and replacing only the pea gravel layer, without replacing the lower stone aggregate layers.

Infiltration trenches can also be modified by adding a layer of organic material (peat) or loam to the trench subsoil. This modification appears to enhance the removal of metals and nutrients through adsorption. The trenches are then covered with an impermeable geotextile membrane overlain with topsoil and grass (Figure 2).

A vegetated buffer strip (6.1 to 7.6 meters, or 20-25 feet, wide) should be established adjacent to the infiltration trench to capture large sediment particles in the runoff. The buffer strip should be installed immediately after trench construction using sod instead of hydroseeding (Schueler, 1987). The buffer strip should be graded with a slope between 0.5 and 15 percent so that runoff enters the trench as sheet flow. If runoff is piped or channeled to the trench, a level spreader must be installed to create sheet flow (Harrington, 1989).

During excavation and trench construction, only light equipment such as backhoes or wheel and ladder type trenchers should be used to minimize compaction of the surrounding soils. Filter fabric should be placed around the walls and bottom of the trench and 0.3 meters (1 foot) below the trench

surface. The filter fabric should overlap each side of the trench in order to cover the top of the stone aggregate layer (see Figure 1). The filter fabric prevents sediment in the runoff and soil particles from the sides of the trench from clogging the aggregate. Filter fabric that is placed 0.3 meters (1 foot) below the trench surface will maximize pollutant removal within the top layer of the trench and decrease the pollutant loading to the trench bottom, reducing frequency of maintenance.

The required trench volume can be determined by several methods. One method calculates the volume based on capture of the first flush, which is defined as the first 1.3 centimeters (0.5 inches) of runoff from the contributing drainage area (SEWRPC, 1991). The State of Maryland (MD., 1986) also recommends sizing the trench based on the first flush, but defines first flush as the first 1.3 centimeters (0.5 inches) from the contributing impervious area. The Metropolitan Washington Council of Governments (MWCOG) suggests that the trench volume be based on the first 1.3 centimeters (0.5 inches) per impervious acre or the runoff produced from a 6.4 centimeter (2.5 inch) storm. In Washington D.C., the capture of 1.3 centimeters (0.5 inches) per impervious acre accounts for 40 to 50 percent of the annual storm runoff volume. The runoff not captured by the infiltration trench should be bypassed to another BMP (Harrington, 1989) if treatment of the entire runoff from the site is desired.

Trench depths are usually between 0.9 and 3.7 meters (3 and 12 feet) (SEWRPC, 1991, Harrington, 1989). However, a depth of 2.4 meters (8 feet) is most commonly used (Schueler, 1987). A site specific trench depth can be calculated based on the soil infiltration rate, aggregate void space, and the trench storage time (Harrington, 1989). The stone aggregate used in the trench is normally 2.5 to 7.6 centimeters (1 to 3 inches) in diameter, which provides a void space of 40 percent (SEWRPC, 1991, Harrington, 1989, Schueler, 1987).

A minimum drainage time of 6 hours should be provided to ensure satisfactory pollutant removal in the infiltration trench (Schueler, 1987, SEWRPC, 1991). Although trenches may be designed to provide temporary storage of storm water, the trench should drain prior to the next storm event. The drainage time will vary by precipitation zone. In the Washington, D.C. area, infiltration trenches are designed to drain within 72 hours.

An observation well is recommended to monitor water levels in the trench. The well can be a 10.2 to 15.2 centimeter (4 to 6 inch) diameter PVC pipe, which is anchored vertically to a foot plate at the bottom of the trench as shown in Figure 1 above. Inadequate drainage may indicate the need for maintenance.

PERFORMANCE

Infiltration trenches function similarly to rapid infiltration systems that are used in wastewater treatment. Estimated pollutant removal efficiencies from wastewater treatment performance and modeling studies are shown in Table 1.

Based on this data, infiltration trenches can be expected to remove up to 90 percent of sediments, metals, coliform bacteria and organic matter, and up to 60 percent of phosphorus and nitrogen in the runoff (Schueler, 1992). Biochemical oxygen demand (BOD) removal is estimated to be between 70 to 80 percent. Lower removal rates for nitrate, chlorides and soluble metals should be expected,

TABLE 1 TYPICAL POLLUTANT REMOVAL EFFICIENCY

Pollutant	Typical Percent Removal Rates
Sediment	90%
Total Phosphorous	60%
Total Nitrogen	60%
Metals	90%
Bacteria	90%
Organics	90%
Biochemical Oxygen Demand	70-80%

Source: Schueler, 1992.

especially in sandy soils (Schueler, 1992).

Pollutant removal efficiencies may be improved by using washed aggregate and adding organic matter and loam to the subsoil. The stone aggregate should be washed to remove dirt and fines before placement in the trench. The addition of organic material and loam to the trench subsoil will enhance metals and nutrient removal through adsorption.

OPERATION AND MAINTENANCE

Infiltration, as with all BMPs, must have routine inspection and maintenance designed into the life performance of the facility. Maintenance should be performed as indicated by these routine inspections. The principal maintenance objective is to prevent clogging, which may lead to trench failure. Infiltration trenches and any pretreatment BMPs should be inspected after large storm events and any accumulated debris or material removed. A more thorough inspection of the trench should be conducted at least annually. Annual inspection should include monitoring of the observation well to confirm that the trench is draining within the specified time. Trenches with filter fabric should be inspected for sediment deposits by removing a small section of the top layer. If inspection indicates that the trench is partially or completely clogged, it should be restored to its design condition.

When vegetated buffer strips are used, they should be inspected for erosion or other damage after each major storm event. The vegetated buffer strip should have healthy grass that is routinely mowed. Trash, grass clippings and other debris should be removed from the trench perimeter and should be disposed properly. Trees and other large vegetation adjacent to the trench should also be removed to prevent damage to the trench.

COSTS

Construction costs include clearing, excavation, placement of the filter fabric and stone, installation of the monitoring well, and establishment of a vegetated buffer strip. Additional costs include planning, geotechnical evaluation, engineering and permitting. The Southeastern Wisconsin Regional Planning Commission (SEWRPC, 1991) has developed cost curves and tables for infiltration trenches based on 1989 dollars. The 1993 construction cost for a relatively large infiltration trench (i.e., 1.8 meters (6 feet) deep and 1.2 meters (4 feet) wide with a 68 cubic meter (2,400 cubic feet) volume) ranges from $8,000 to $19,000. A smaller infiltration trench (i.e., 0.9 meters (3 feet) deep and 1.2 meters (4 feet) wide with a 34 cubic meter (1,200 cubic feet) volume) is estimated to cost from $3,000 to $8,500.

Maintenance costs include buffer strip maintenance and trench inspection and rehabilitation. SEWRPC (1991) has also developed maintenance costs for infiltration trenches. Based on the above examples, annual operation and maintenance costs would average $700 for the large trench and $325 for the small trench. Typically, annual maintenance costs are approximately 5 to 10 percent of the capital cost (Schueler, 1987). Trench rehabilitation, may be required every 5 to 15 years. Cost for rehabilitation will vary depending on site conditions and the degree of clogging. Estimated rehabilitation costs run from 15 to 20 percent of the original capital cost (SEWRPC, 1991).

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ADDITIONAL INFORMATION

City of Alexandria, Virginia
Warren Bell
Department of Transportation and Environmental Services
P.O. Box 178
Alexandria, VA 22313

Carroll County, Maryland
Martin Covington
Bureau of Developmental Review
225 North Center Street
Westminster, MD 21157-5194

King County, Washington
Dave Hancock
Department of Natural Resources, Water and Land Resources Division, Drainage Services Section
700 5th Avenue, Suite 2200
Seattle, WA 98104

Montgomery County, Maryland
Rick Brush
Department of Permitting Services, Water Resource Section
250 Hungerford Drive, Suite 175
Rockville, MD 20850

Southeastern Wisconsin Regional Planning Commission
Bob Biebel
916 N. East Avenue, P.O. Box 1607
Waukesha, WI 53187

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For more information contact:

Municipal Technology Branch
U.S. EPA
Mail Code 4204
401 M St., S.W.
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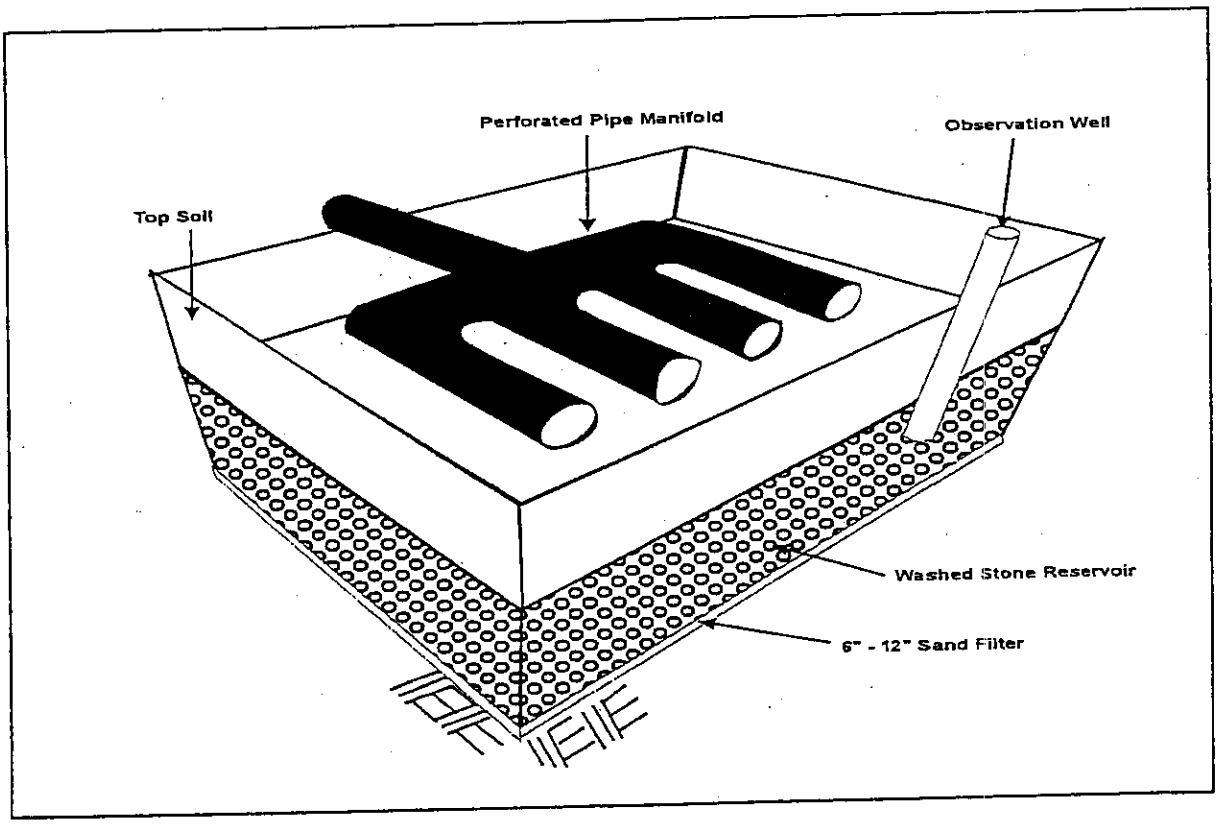
EPA 832-F-99-018
September 1999

EPA

Storm Water Technology Fact Sheet
Infiltration Drainfields

DESCRIPTION

Infiltration drainfields are innovative technologies that are specially designed to promote storm water infiltration into subsoils. These drainfields help to control runoff and prevent the contamination of local watersheds. The system is usually composed of a pretreatment structure, a manifold system, and a drainfield. Runoff is first diverted into a storm sewer system that passes through a pretreatment structure such as an oil and grit separator. The oil and grit chamber effectively removes coarse sediment, oils, and grease from the runoff. The storm water runoff then continues through a manifold system into the infiltration drainfield. The manifold system consists of a perforated pipe which distributes the runoff evenly throughout the infiltration drainfield. The runoff then percolates through an underlying aggregate sand filter and filter fabric into the subsoils. An example of this system is provided in Figure 1.



Source: Metropolitan Washington Council of Governments, 1987.

FIGURE 1 TYPICAL INFILTRATION DRAINFIELD SCHEMATIC

Common design modifications to the infiltration drainfield best management practice (BMP) include the installation of porous pavement surrounded by a grass filter strip over the infiltration drainfield or the insertion of an emergency overflow pipe in the oil and grit pretreatment chamber. The overflow pipe allows runoff volumes exceeding design capacities to discharge directly to a trunk storm sewer system.

APPLICABILITY

Infiltration drainfields are most applicable on sites with a relatively small drainage area (less than 15 acres.) They can be used to control runoff from parking lots, rooftops, impervious storage areas, or other land uses. Infiltration drainfields should not be used in locations that receive a large sediment load that could clog the pretreatment system, which in turn would plug the infiltration drainfield and reduce its effectiveness.

Soils in areas where the installation of an infiltration drainfield is being considered should have field-verified permeability rates of greater than 0.5 inches per hour and should include a 4-foot minimum clearance between the bottom of the system and the bedrock or the water table.

ADVANTAGES AND DISADVANTAGES

The use of infiltration drainfields may be restricted in regions with colder climates, arid regions, regions with high wind erosion rates (because of increased windblown sediment loads), and areas of sole source aquifers. Some specific limitations of infiltration drainfields include:

- High maintenance when sediment loads to the drainfield are heavy.
- High costs of engineering design, excavation, fill material, and pretreatment systems.
- Short life span if not well maintained.
- Not suitable for use in regions with clay or silty soils.
- Not suitable for use in regions where groundwater is used locally for human consumption.
- Anaerobic conditions that could clog the soil and reduce the capacity and performance of the system may develop in underlying soils if there is not sufficient time between storm events to allow the soil to dry out.

One potential negative impact of infiltration drainfields is the risk of groundwater contamination. Studies to date do not indicate that this is a major risk if site suitability guidelines are observed. However, migration of nitrates and chlorides from the drainfield has been documented.

Additional questions regarding infiltration drainfields remain to be answered:

- Is the oil and grit separator the most effective pretreatment system to protect infiltration capacity?
- What are the pollutant removal capacities of infiltration drainfields with various pretreatment systems?
- Is the performance of infiltration drainfields better than the performance of infiltration basins and trenches during subfreezing weather and snow melt runoff conditions?
- What level of maintenance is required to ensure proper performance?

DESIGN CRITERIA

Infiltration drainfields, along with most other infiltration BMP structures (infiltration trenches, basins, etc.) have proved to have short life spans in the past. Failure of the systems has been attributed to poor design, inadequate construction techniques, low permeability soils, and a lack of pretreatment. Some design factors which could significantly increase the longevity of infiltration drainfields and other infiltration processes are shown in Table 1.

TABLE 1 INFILTRATION DRAINFIELD DESIGN CRITERIA

Design Criteria	Guidelines
Site Evaluation	Take soil borings to a depth of at least 4 feet below bottom of stone reservoir to check for soil permeability, porosity, depth to seasonally high water table, and depth to bedrock. Not recommended on slopes greater than 5 percent and best when slopes are as flat as possible. Minimum infiltration rate 3 feet below bottom of stone reservoir: 0.5 inches per hour. Minimum depth to bedrock and seasonally high water table: 4 feet. Minimum setback from building foundations: 10 feet downgradient, 100 feet upgradient. Drainage area should be less than 15 acres.
Design Storm Storage Volume	Literature values suggest this parameter is highly variable and dependent upon regulatory requirements. One typically recommended storage volume is the stormwater runoff volume produced in the tributary watershed by the 6- month, 24-hour duration storm event.
Drainage Time for Design Storm	Minimum: 12 hours. Maximum: 72 hours. Recommended: 24 hours.
Construction	Excavate and grade with light equipment with tracks or oversized tires to prevent soil compaction. As needed, divert stormwater runoff away from site before and during construction. A typical infiltration cross-section consists of the following : 1) a stone reservoir consisting of coarse 1.5 to 3-inch diameter stone (washed); 2) 6 to 12-inch sand filter at the bottom of the drainfield; and 3) filter fabric.
Pretreatment	Pretreatment is recommended to treat runoff from all contributing areas.
Dispersion Manifold	A dispersion manifold should be placed in the upper portions of the infiltration drainfield. The purpose of this manifold is to evenly distribute storm water runoff over the largest possible area. Two to four manifold extension pipes are recommended for most typical infiltration drainfield applications.

Source: Minnesota Pollution Control Agency, 1989.

PERFORMANCE

The effectiveness of infiltration drainfields depends upon their design. When runoff enters the drainfield, 100 percent of the pollutants are prevented from entering surface water. Any water that bypasses the pretreatment system and drainfield will not be treated. Pollutant removal mechanisms include absorption and adsorption, straining, microbial decomposition in the soil below the drainfield, and trapping of sediment, grit, and oil in the pretreatment chamber.

Currently there is little monitoring data on the performance of infiltration drainfields. However, some monitoring data is available on porous pavements. The design criteria for porous pavements is very similar to the design criteria of infiltration drainfields. An estimate of porous pavement pollutant removal efficiencies ranges between 82 and 95 percent for sediment, 65 percent for total phosphorus, and 80 to 85 percent for total nitrogen. Porous pavement works most effectively for about 6 months.

Some key factors to increase pollutant removal efficiencies include:

- Properly maintaining the system.
- Implementing good housekeeping practices in the tributary drainage area.
- Allowing sufficient drying time (approximately 24 hours) between storm events.

- Choosing a site with highly permeable soils and subsoils.
- Incorporating a pretreatment system.
- Ensuring that there is sufficient organic matter in subsoils.
- Using a sand layer on top of a filter fabric at the bottom of the drainfield.

OPERATION AND MAINTENANCE

Routine maintenance of infiltration drainfields is extremely important. The pretreatment grit chamber should be checked at least four times per year and after major storm events. Sediment should be cleaned out when the sediment depletes more than 10 percent of the available infiltration capacity. This can be done manually or by vacuum pump. Inlet and outlet pipes should also be inspected at this time.

The infiltration drainfield should contain an observation well that can provide information on how well the system is operating. It is recommended that the observation well be monitored daily after runoff-producing storm events. If the infiltration drainfield does not drain after three days, it usually means that the drainfield is clogged. Once the performance characteristics of the structure have been verified, the monitoring schedule can be reduced to a monthly or quarterly basis.

COSTS

There is little information on the cost of infiltration drainfields. However, the construction costs for installing an infiltration drainfield that is 30.5 meters (100 feet) long, 15 meters (50 feet) wide, 2.4 meters (8 feet) deep and with 1.2 meters (4 feet) of cover can be estimated using the general information in Table 2.

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ADDITIONAL INFORMATION

Center for Watershed Protection
Tom Schueler
8391 Main St.
Ellicott City, MD 21043

State of Minnesota
Lou Flynn
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155

Northern Virginia Planning District Commission
David Bulova
7535 Little River Turnpike, Suite 100
Annandale, VA 22003

Southeastern Wisconsin Regional Planning Commission
Bob Biebel
916 N. East Avenue, P.O. Box 1607
Waukesha, WI 53187

Washington State Department of Ecology
Stan Ciuba
Stormwater Unit
P.O . Box 47696
Olympia, WA 98504

TABLE 2 ESTIMATED COST FOR INSTALLING AN INFILTRATION DRAINFIELD

Excavation Costs: 2,220 yd^3 @ \$5.00/yd^3	\$11,100
Stone Fill: (1,296 yd^3)(\$20.00/yd^3)	\$25,920
Sand Fill: (185 yd^3)(\$10.00/yd^3)	\$1,850
Filter Fabric: Top and Bottom= 10,000 ft^2 Sides= 1,600 + 800= 2,400 ft^2 +10%= 13,640 ft^2 (13,640 ft^2)(1 yd^2 /9 ft^2)(\$3.00/yd^2)	\$4,550
Perforated Manifold and Inlet Pipe: 75 ft + (4)(40ft)= 235 ft + 40 ft = 275 ft (275)(\$10.00/ft)	\$2,750
Observation Well: 1 at \$500 each	\$500
Pretreatment Chamber: 1 at \$10,000	\$10,000
Miscellaneous (back filling, overflow pipe, sodding, etc.):	\$1000
Subtotal:	**\$57,670**
Contingencies (engineering, administration, permits, etc.)= 25%	\$14,420
Total:	**\$72,090**

Note: Unit price will vary greatly depending upon local market conditions

Source: SWRPC, 1992.

The mention of trade names or commercial products does not constitute endorsement or recommendation for the use by the U.S. Environmental Protection Agency.

For more information contact:

Municipal Technology Branch
U.S. EPA
Mail Code 4204
401 M St., S.W.
Washington, D.C., 20460

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Excellence in compliance through optimal technical solutions
MUNICIPAL TECHNOLOGY BRANCH

Stormwater Management Fact Sheet: Infiltration Basin

Description

An infiltration basin is a shallow impoundment that is designed to infiltrate stormwater into the soil. Infiltration basins are believed to have a high pollutant removal efficiency, and can also help recharge the groundwater, thus restoring low flows to stream systems. Infiltration basins can be problematic at many sites because of stringent soils requirements. In addition, some studies have relatively high failure rates compared with other stormwater treatment practices.

Applicability

Infiltration basins need to be applied very carefully, as their use is often sharply restricted by concerns over groundwater contamination, site feasibility, soils, and clogging at the site.

Regional Applicability
Infiltration basins can be utilized in most regions of the country, with some design modifications in cold and arid climates. In regions of karst topography, these infiltration basins should not be applied due to concerns of sink hole formation and groundwater contamination.

Ultra Urban Areas
Ultra urban areas are densely developed urban areas in which little pervious surface exists. In these areas, few stormwater practices can be easily applied due to space limitations. Infiltration basins can rarely be applied in the ultra urban environment. Two features that can restrict their use are the potential of infiltrated water to interfere with existing infrastructure, and the relatively poor infiltration capacity of most urban soils. In addition, while they consume about the amount of space as infiltration trenches, they need a continuous, relatively flat area. Thus, it is more difficult to fit them into small unusable areas on a site.

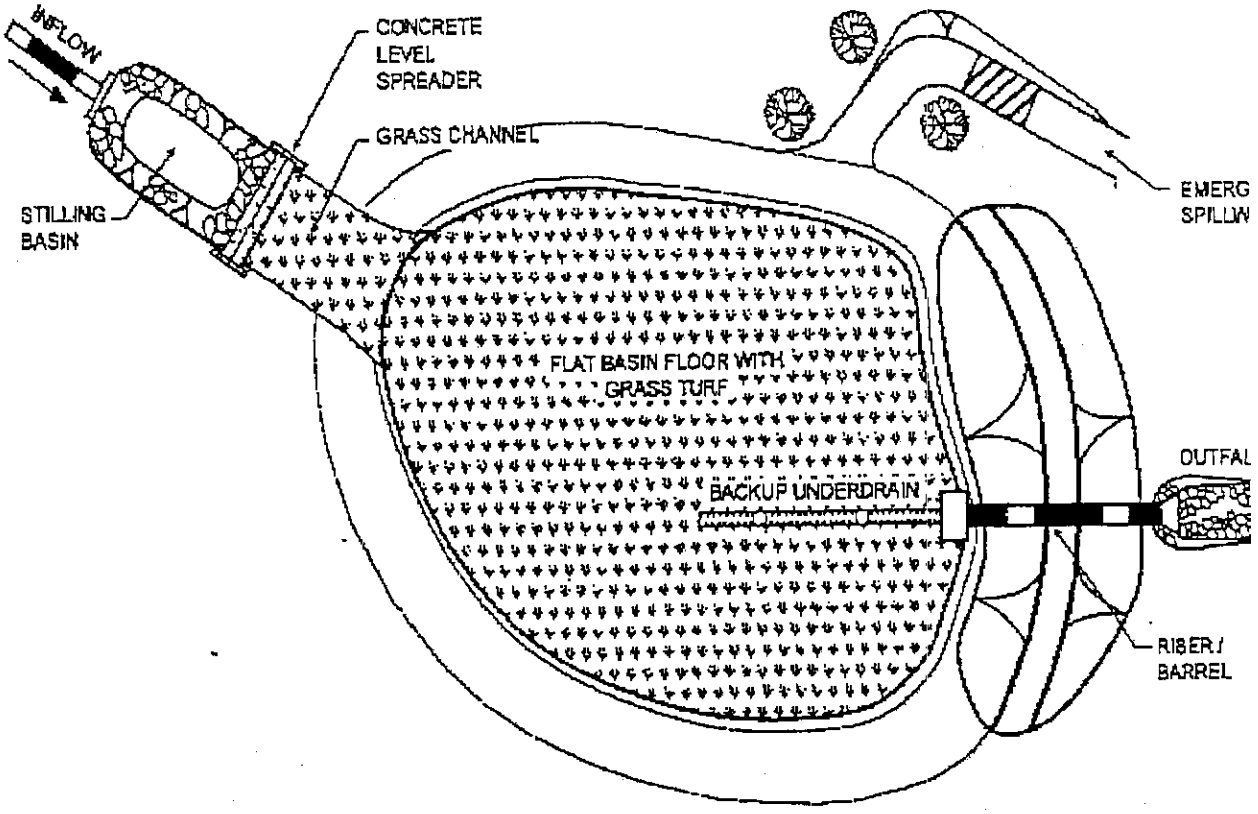
Stormwater Hotspots
A stormwater hotspot is an area where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater. Infiltration basins should never receive runoff from stormwater hotspots, unless the stormwater has already been fully treated by another stormwater treatment practice. This is due to potential groundwater contamination (see *Risk of Groundwater Contamination from Infiltration of Stormwater*, Article 104 in the Practice of Watershed Protection).

Stormwater Retrofit
A stormwater retrofit is a stormwater practice (usually structural) put into place after development has occurred, to improve water quality, protect downstream channels, reduce flooding, or meet other watershed restoration objectives. Infiltration basins have limited application as a stormwater retrofit. Their use is restricted by three factors. First, infiltration basins are generally used to treat small sites (less than five acres). Small site practices, such as infiltration basins, generally are a high cost retrofit option (in terms of construction cost and the maintenance burden) since a large number of practices are needed to fully retrofit a watershed. Second, it is often difficult to find areas where soils are appropriate for infiltration in an already urban or suburban environment. Finally, infiltration basins are best applied to small sites, yet need a flat, relatively continuous area. It is often difficult to find sites in a watershed that meet these criteria.

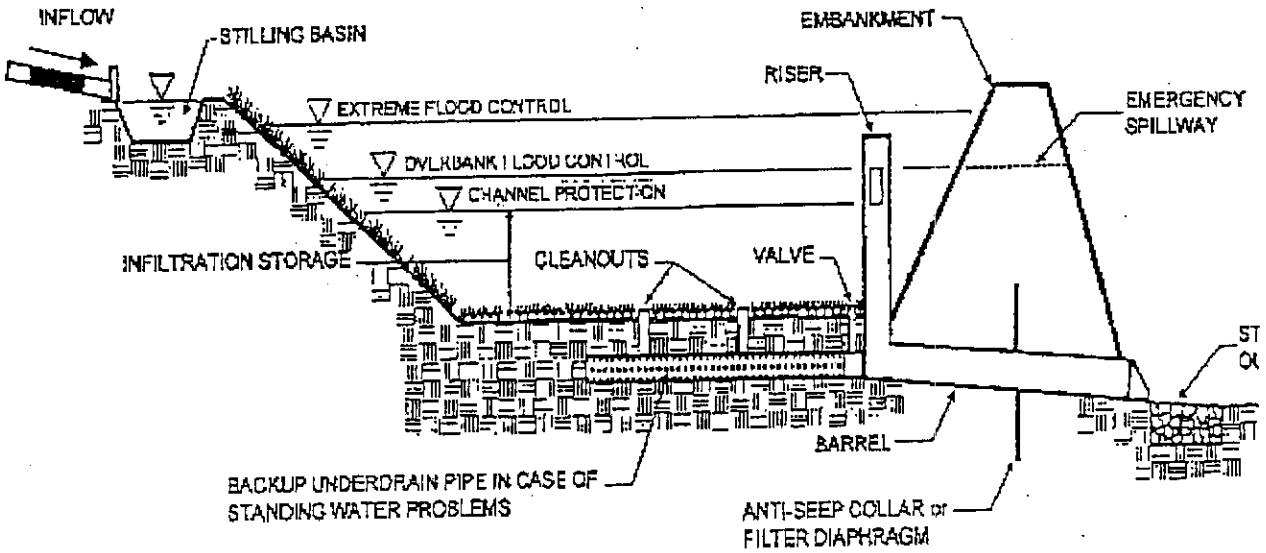
Cold Water (Trout) Streams
Infiltration basins are an excellent option for cold water streams because they encourage infiltration of stormwater and maintain dry weather flow. Because stormwater travels underground to the stream, it has little opportunity to increase in temperature.

Siting and Design Considerations

When designing infiltration basins, designers need to carefully consider both the restrictions on site and design features to improve the long-term performance of the practice (see Figure 1).


INFLOW
CONCRETE LEVEL SPREADER
GRASS CHANNEL
STILLING BASIN
FLAT BASIN FLOOR WITH GRASS TURF
BACKUP UNDERDRAIN
EMERG SPILLW
OUTFAL
RISER / BARREL

PLAN


INFLOW
STILLING BASIN
EXTREME FLOOD CONTROL
OVERBANK FLOOD CONTROL
CHANNEL PROTECTION
INFILTRATION STORAGE
CLEANOUTS
VALVE
RISER
EMBANKMENT
EMERGENCY SPILLWAY
BARREL
BACKUP UNDERDRAIN PIPE IN CASE OF STANDING WATER PROBLEMS
ANTI-SEEP COLLAR or FILTER DIAPHRAGM

Siting Considerations
Infiltration practices need to be located extremely carefully. In particular, designers need to ensure that the soils on the site are appropriate for infiltration, and that designs minimize the potential for groundwater contamination, and long term maintenance problems.

Drainage Area

Infiltration basins have been used as regional facilities, providing both water quality and flood control in some communities. This practice may be feasible if the soils are particularly sandy. In most areas of the country, however, infiltration basins experience high rates of failure when used in this manner. In general, the practice is best applied to relatively small drainage areas (i.e., less than ten acres), and exclusively for groundwater recharge and water quality treatment.

Slope

The bottom of infiltration basins needs to be completely flat to allow infiltration throughout the entire basin bottom.

Soils /Topography

Soils and topography are a strongly limiting factor when locating infiltration practices. Soils must be significantly permeable to ensure that the practice can infiltrate quickly enough to reduce the potential for clogging, and soils that infiltrate too rapidly may not provide sufficient treatment, creating the potential for groundwater contamination. The infiltration rate should range between 0.5 and 3 inches per hour. Detailed soil tests are needed to determine if fragipans, hardpans or other confining layers are present. In addition, the soils should have no greater than 20% clay content, and less than 40% silt/clay content (CWP, 1998). Finally, infiltration basins may not be used in regions of karst topography, due to the potential for sink hole formation, or groundwater contamination.

Groundwater

Designers always need to provide significant separation distance (2' to 5') from the bottom of the infiltration basin and the seasonally high ground water table, to reduce the risk of contamination. Infiltration practices should also be separated by at least 150 feet from adjacent drinking water wells.

Design Considerations
Specific designs may vary considerably, depending on site constraints or preferences of the designer or community. There are some features, however, that should be incorporated into most infiltration basin designs. These design features can be divided into five basic categories: *pretreatment, treatment, conveyance, maintenance reduction*, and *landscaping* (for more information see Manual Builder Category).

Pretreatment

Pretreatment refers to design features that provide settling of large particles before runoff reaches a management practice, easing the long-term maintenance burden. Pretreatment is exceptionally important for all infiltration practices. In order to ensure that pretreatment mechanisms are effective, designers should incorporate "multiple pretreatment," using practices such as grass swales, sediment basins, and vegetated filter strips in series, prior to the infiltration basin.

Treatment

Treatment features enhance the pollutant removal of an infiltration basin. Designers need to stabilize upland soils to ensure that the basin does not become clogged with sediment. In addition, the basin needs to be sized so that the volume of water to be treated infiltrates through the bottom in a given amount of time. Because infiltration basins are designed in this manner, infiltration basins designed on less permeable soils will be significantly larger than those designed on more permeable soils.

Conveyance

Stormwater needs to be conveyed through stormwater treatment practices safely, and in a way that minimizes erosion. Designers need to be particularly careful in ensuring that channels leading to an infiltration practice are designed to minimize erosion. In general, infiltration basins should be designed to treat only small storms, (i.e., only for water quality). Thus, these practices should be designed "off-line," using a flow separator to divert only small flows to the practice.

Maintenance Reduction

In addition to regular maintenance activities, designers also need to incorporate features into the design phase to ensure that the maintenance burden of a practice is reduced. These designers can make regular maintenance activities easier or reduce the need to perform maintenance. In infiltration basins, designers need to provide access to the basin and its forebay for regular maintenance activities. Where possible provide a means to drain the basin, such as an underdrain, in case the bottom becomes clogged. This feature allows the basin to be drained and accessed for maintenance in the event that the water has ponded in the bottom of the basin , or the soil is saturated.

Landscaping

Landscaping can enhance the aesthetic value of stormwater practices, or improve their function. In infiltration basins, the most important purpose of vegetation is to reduce the tendency of the practice to clog. Upland drainage needs to be properly stabilized with a thick layer of vegetation, particularly immediately following construction. In addition, providing a thick turf at the basin bottom helps encourage infiltration and prevent the formation of rills in the basin bottom.

Design Variations
Some modifications may be needed to ensure the performance of infiltration basins in arid and cold climates.

Arid or Semi-Arid Climates

In arid regions, infiltration practices are often highly recommended because of the need to recharge the groundwater. In arid regions, designers need to emphasize pretreatment even more strongly to ensure that the practice does not clog, because of the high sediment concentrations associated with stormwater runoff in the arid southwest. In addition, the basin bottom may be planted with drought tolerant species and covered with an alternative material such as sand or gravel.

Cold Climates

In extremely cold climates (i.e., regions that experience permafrost), infiltration basins may be an infeasible option. In most cold climates, infiltration basins can be a feasible practice, but there are some challenges to its use. First, the practice may become inoperable during some portions of the year when the surface of the basin becomes frozen. Other design features may also be incorporated to deal with the challenges of cold climates. One such challenge is the volume of runoff associated with the spring snowmelt event. The volume of the infiltration basin may be increased to account for snowmelt.

Another option is the use of a seasonably operated facility (Oberts, 1994)(for more information see *Performance of Stormwater Ponds and Wetlands in Winter*, Article 71 in The Practice of Watershed Protection). A seasonally operated infiltration/detention basin combines several techniques to improve the performance of infiltration practices in cold climates. Two features, the underdrain system and level control valves, are useful in cold climates. These features are used as follows: In the beginning of the winter season, the level control valve is opened and the soil is drained. As the snow begins to melt in the spring, the underdrain and the level control valves are closed. The snowmelt is infiltrated until the capacity of the soil is reached. Then, the facility acts as a detention facility, providing storage for particles to settle.

Other design features can help to minimize problems associated with winter conditions, particularly concerns that chlorides from road salting may contaminate groundwater. The basin may be disconnected during the winter to ensure that chlorides do not enter the groundwater in areas where this is a problem, or if the basin is used to treat roadside runoff. Designers may also want to reconsider application of infiltration practices on parking lots or roads where deicing is used, unless it is confirmed that the practice will not cause elevated chloride levels in the groundwater. If the basin is used for snow storage, or to treat roadside or parking lot runoff, basin bottom should be planted with salt

tolerant vegetation.

Limitations

While infiltration basins can be useful practices, they have several major limitations. Infiltration basins are not generally not an attractive practice, particularly when they clog. If they clog, soils become saturated, and the basin can be a source of mosquitoes. In addition, infiltration basins may not be feasible because of concerns over groundwater contamination and sufficient soil infiltration. Finally, maintenance of infiltration practices can be burdensome, as they have the highest rate of failure of any stormwater treatment practice.

Maintenance Considerations

Regular maintenance is critical to the successful operation of infiltration basins. Historically, infiltration basins have had a poor track record. In one study conducted in Prince George's County, Maryland (Galli, 1992), all of the infiltration basins investigated clogged within two years. This trend may not be the same in soils with high infiltration rates, however. A study of twenty-three infiltration basins in the Pacific Northwest showed somewhat better long-term performance in an area with highly permeable soils (Schueler, 2000). In this study, some infiltration basins continued to fail after 10 years (for more information, see *Longevity of Infiltration Basins Assessed in Puget Sound*, Article 102 in The Practice of Watershed Protection).

Table 1. Typical Maintenance Activities for Infiltration Basins (Source: Modified from WMI, 1997)

Activity	Schedule
• Inspect facility for signs of wetness or damage to structures • Note eroded areas. • If dead or dying grass on the bottom is observed, check to ensure that water percolates 2-3 days following storms. • Note signs of petroleum hydrocarbon contamination and handle properly.	Semi-Annual Inspection
• Mow and remove litter and debris • Stabilization of eroded banks. • Repair undercut and eroded areas at inflow and outflow structures.	Standard Maintenance (As Needed)
• Disc or otherwise aerate bottom. • Dethatch basin bottom.	Annual Maintenance
• Scrape bottom and remove sediment. Restore original cross-section and infiltration rate. • Seed or sod to restore ground cover.	5-year Maintenance

Effectiveness

Structural management practices can be used to achieve four broad resource protection goals. These include: *Flood Control, Channel Protection, Groundwater Recharge*, and *Pollutant Removal* (see Manual Builder Category for more information). Infiltration basins can provide groundwater recharge and pollutant removal.

Groundwater Recharge
Infiltration basins recharge the groundwater because runoff is treated for water quality by filtering through the soil and discharging to groundwater.

Pollutant Removal
Very little data are available regarding the pollutant removal associated with infiltration basins. It is generally assumed that they have very high pollutant removal, because none of the stormwater entering the practice remains on the surface. Schueler (1987) estimated pollutant removal for based on data from land disposal of wastewater. The

average pollutant removal, assuming the infiltration basin is sized to treat the runoff from a one inch storm, is as follows:

Table 2. Pollutant Removal Efficiency of Infiltration Basins (Schueler, 1987)	
Pollutant	**Pollutant Removal(%)**
TSS	75
TP	60 - 70
TN	55 - 60
Metals	85 - 90
Bacteria	90

These removal efficiencies assume that the infiltration basin is well designed and maintained. The information in the *Siting and Design Considerations* and *Maintenance* sections represent the best available information on how to properly design these practices. Also consult the design references below.

Cost Considerations

Infiltration basins are relatively cost-effective practices, because little infrastructure is needed when constructing them One study estimated the total construction cost at about $2 per cubic foot (adjusted for inflation) of storage for a 0.25-acre basin (SWRPC, 1991). Infiltration basins typically consume about 2% to 3% of the site draining to them, which is relatively small. Maintenance costs are estimated at approximately 5% to 10% of construction costs.

One cost concern associated with infiltration practices is the maintenance burden and longevity. If improperly maintained, infiltration basins have a high failure rate (see *Maintenance*). Thus, it may be necessary to replace the basin after a relatively short period of time.

References

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Southeastern Wisconsin Regional Planning Commission (SWRPC). 1991. Costs of Urban Nonpoint Source Water Pollution Control Measures. Waukesha, WI.

US EPA. 1993. Office of Water. Guidance to Specify Management Measures for Sources of Nonpoint Pollution in Coastal Waters. EPA-840-B-92-002. Washington, DC.

Watershed Management Institute (WMI). 1997. Operation, Maintenance, and Management of Stormwater Management Systems. Prepared for: US EPA Office of Water. Washington, DC.

Appendix H

Zoning Code – Wetland Conservation

driveway that leads to a legal parking space.

On corner lots, accessory buildings, structures or uses shall be set back from the street a distance equal to that required of the principal structure.

When an accessory building, structure or use is constructed in a rear yard which adjoins a side yard or front yard, the accessory building, structure or use shall be set back from the interior lot line a distance equal to the minimum side yard required of the principal structure.

On all other lots, accessory buildings shall be set back at least three (3) feet from all interior lot lines, and overhangs shall be set back at least one-third (1/3) the distance of the setback of the garage wall or one (1) foot, whichever is greater.

This setback requirement from all interior lot lines for accessory buildings in rear yards shall be waived when a maintenance easement is recorded as to the affected properties, when proof of such recorded easement is provided at the time of application for a building permit and when the accessory building is located at least three (3) feet from any building on an adjoining lot. The recording of the maintenance easement shall be interpreted to mean that the following intents and purposes of this setback requirement are met:

(1) Adequate supply of sunlight and air to adjacent property;

(2) Sufficient space for maintenance of the building from the same lot; and

(3) Prevention of damage to adjoining property by fire or runoff from roofs.

A recorded common wall agreement is permitted in lieu of a maintenance easement if the accessory structure is attached to an accessory structure on an adjoining lot.

(c) In any residential area, accessory buildings shall not exceed fifteen (15) feet in height; provided, however, that accessory buildings with a flat or shed roof style shall not exceed twelve (12) feet in height. Carriage house dwellings shall not exceed twenty-five (25) feet in height.

Exception: Accessory building heights shall not apply to property within designated heritage preservation districts nor to designated historic sites. In these cases appropriate building heights for accessory structures shall be determined through the design review process to ensure that heights are acceptable and in keeping with scale and style of development on the property.

(d) Accessory buildings on a zoning lot may occupy up to thirty-five (35) percent of the rear yard. Rear yards which adjoin alleys may include half the area of the alley to calculate the area of the rear yard which may be occupied by accessory buildings.

On zoning lots containing one- and two-family dwellings, there shall be a maximum of three (3) accessory buildings, the total of which shall not occupy more than one thousand (1,000) square feet of the zoning lot. On zoning lots containing all other uses, accessory buildings may occupy the same percent of the zoning lot as main buildings are allowed to occupy in the zoning district.

(e) In those instances where a lot line adjoins an alley right-of-way, the accessory building shall not be closer than one foot to such lot line.

(f) On through lots, where frontage is clearly established within a given block, rear yard setbacks shall be equal to the side yard setback required of the principal structure.

(g) Accessory buildings shall be located at least six (6) feet from the principal structure or shall be considered attached for purposes of the zoning code.

ARTICLE VI. 63.600. WETLAND CONSERVATION

Sec. 63.601. Purpose.

The purpose of article VI, wetland conservation, of this chapter is to implement the Wetland Conservation Act of 1991 (Minn. Laws 1991 Chapter 354, as amended), and the accompanying rules of the Minnesota Board of Water and Soil Resources (Minn. Rules Chapter 8420, as amended).

Sec. 63.602. Incorporation by reference.

Article VI, wetland conservation, of this chapter incorporates by reference the Wetland Conservation Act and the accompanying rules. All words and terms used in this chapter which are defined in the act, rules or elsewhere in the zoning code shall have the meanings given therein.

Sec. 63.603. Scope.

Article VI, wetland conservation, of this chapter regulates the draining and filling of wetlands and parts of wetlands within the city. It is a part of the zoning code (official controls).

Sec. 63.604. Exemption and no-loss determinations.

The zoning administrator shall make determinations whether plans to drain or fill wetlands are exempt from the requirements to replace drained or filled wetlands, as set forth in Minn. Rules Part 8420.0210, and whether proposed work will result in a loss of wetlands, as set forth in Minn. Rules Part 8420.0220. The zoning administrator may seek the advice of the technical evaluation panel on questions of wetlands

delineation and type.

The zoning administrator's decisions are final unless an administrative appeal to the board of zoning appeals is filed as set forth in section 61.700 of the zoning code.

Sec. 63.605. Sequencing.

The planning commission may not consider a wetland replacement plan unless it finds that the applicant has complied with all of the principals of sequencing in Minn. Rules Parts 8420.0520. Provided that if the size of the wetland to be drained or filled is less than one-tenth (0.1) of an acre, the zoning administrator shall make the sequencing findings as set forth in Minn. Rules Part 8420.0520, Subpart 2.

Sec. 63.606. Conditional uses.

Draining or filling wetlands except wetlands determined exempt in section 63.604 shall be conditional uses in all zoning districts.

Sec. 63.607. Replacement plans.

(a) No draining or filling of wetlands shall take place until plans to replace the drained or filled wetlands have been approved by the planning commission. Replacement plans shall conform to all the requirements of Minn. Rules Parts 8420.0530--.0550.

(b) Plans to drain or fill wetlands and to replace the drained or filled wetlands shall be acted on by the planning commission in accordance with section 61.500, Conditional use permits, of the zoning code and with the additional notice and time requirements of Minn. Rules Part 8420.0230.

Sec. 63.608. Monitoring replacement wet-

lands.

The zoning administrator shall assure that the wetland replacement plan monitoring and enforcement requirements of Minn. Rules Parts 8420.0600--.0630 are fulfilled.

Sec. 63.609. Wetland banking.

Wetlands may be restored or created within the city for purposes of deposit in the state wetland bank in accordance with Minn. Rules Parts 8420.0700--.0760. The zoning administrator is responsible for approving plans to restore or create wetlands for deposit in the wetland bank, certifying that the wetlands were constructed as planned, and monitoring of banked wetlands and enforcement under the rules.

Sec. 63.610. High priority areas.

Decisions regarding sequencing, replacement plans and banking shall particularly favor preservation, restoration and creation of wetlands in high priority areas as identified in water management plans pursuant to Minn. Rules Part 8420.0350.

Sec. 63.611. Appeals to the board of water and soil resources.

After administrative appeals under the zoning code have been exhausted, decisions made under article VI, wetland banking, of this chapter may be appealed to the board of water and soil resources as set forth in Minn. Rules Part 8420.0250.

Sec. 63.612. Variances.

The board of zoning appeals may grant variances from Article VI, wetland conservation, of this chapter so long as the variances do not vary requirements of the act or the rules.

Sec. 63.613. Technical evaluation panel.

(a) The city council shall appoint a person to serve on the technical evaluation panel. The person must be a technical professional with expertise in water resource management. The city council shall also select one (1) of the members of the panel to act as the contact person and coordinator for the panel.

(b) The city council, planning commission, zoning administrator, property owner or a member of the technical evaluation panel may request that the technical evaluation panel make a technical determination of the public value, location, size or type of wetlands in plans to drain, fill or replace wetlands. No decision on the plans shall be rendered until the panel makes the determination, as set forth in Minn. Rules Part 8420.0240.

Appendix I

Public Education Information

Public Education and Outreach Program

Responsible Department: Public Works Sewer Utility.

Targeted Pollutants: All pollutants

Performance Measures: Number of door hangers distributed, number of storm drains stenciled, number of volunteers, number of workshops, number of events and results of evaluation.

Permit Sections:
- 2.10 Pesticides and Fertilizers
- 2.11 Illicit Discharges and Improper Disposal
- 2.13 Public Education Program

Storm Drain Stenciling Education Program

The City of Saint Paul has been conducting a successful storm drain stenciling education program since 1993. For the past several years the Friends of the Mississippi River (FMR) has coordinated this program. FMR is the leading citizens' organization working to protect the Mississippi River and its watershed in the Twin Cities area. The 2003 Stenciling Program Report and a copy of the door hanger is provided in the Appendix. The number of door hangers distributed, storm drains stenciled and volunteers involved is found in the following table. The number of volunteers was not tracked every year of the program.

City of St. Paul Final Report, 2003

Stenciling

At the close of the 2003 stenciling season, 1,328 volunteers have distributed 8,332 doorhangers and stenciled 2,272 drains. Stenciling was promoted in spring using the following means:

- A March stenciling mailer sent to more than 500 metro schools, community programs, youth organizations, and individuals
- A presentation and stenciling invitation to 3 Big River Journey teacher workshops in February and August
- A phone call to each teacher participating in Big River Journey in Fall 2002 inviting them to stencil
- Recruitment through SPPS Community Resource Specialists
- Cairn & Associate's mailing list of 230 St. Paul Public School teachers
- Notices in FMR's *Mississippi Messages*

Stenciling highlights:

- Beth Storey and Katie Galloway of FMR co-coordinated an event with Ms. Kortas' 10th grade science students from Johnson High School. Students learned about nonpoint source pollution, then stenciled a large area adjacent to Mississippi River Boulevard. They also took part in a discussion about invasive species, then participated in a buckthorn seedling pull in the River Gorge.
- More than 200 Mello Yello 4-H camp participants stenciled 314 drains on June 18th.

Extra Education

1. On Monday, March 31st Beth led 7th grade students at St. Paul Open School in several activities related to household hazardous waste, its proper disposal and effect on water quality. Later in the month Beth returned for a nonpoint source pollution presentation, tying in the issue of household hazardous waste. Students stenciled storm drains in the neighborhood near their school on 2 separate days following the classroom discussions and activities.

2. On Tuesday, April 22nd, Beth led a small group of 10-11th graders from Ms. Reed's Environmental Science class at Central High School in an activity about imperious surfaces. The small groups students had stenciled with their class prior to the small group, but trained another smaller group of students and did additional stenciling near Central High

3. On October 10th Beth did a presentation to an art class and fourth grade class at Four Seasons Elementary School. She covered the natural history of the Mississippi River, natural systems, the effect of impervious surfaces on our local waterways, and the proper disposal of household hazardous waste. The class stenciled later that same week.

4. Beth did a nonpoint source pollution presentation to Mrs. Weaver's 7th grade class at Washington Middle School on October 7th. With 28 students present, information about nonpoint source pollution and its effects on our local waterways was given. Special attention was given to phosphorus as a pollutant. The students completed a discussion sheet during and after the presentation. The following day the students visited Terry Noonan at Como Lake to learn about water quality testing and the improvements being made there. They will stencil in the spring.

5. On the same day, Beth did a presentation with slides to Mr. Kreeger's 8th grade class at Washington Middle School. With 24 students present, information about nonpoint source pollution and what kids & grown ups can do to prevent it was given. The students completed a discussion sheet during and after the presentation. They will stencil in the spring.

6. Beth gave the presentation "Down the Dirty Drain" to five different groups of 30 fifth graders at the Children's Water Festival held at the Minnesota State Fair Grounds September 24th. She covered information about nonpoint source pollution, our drinking water, the storm drain system, and the proper disposal of household hazardous waste.

7. Beth gave a slide presentation to Mr. Booth's fourth grade class at Parkway School prior to their stenciling event on October 6th. She covered the natural history of the Mississippi River, natural systems, and the effect of impervious surfaces on our local waterways. The class stenciled later that same week.

8. As part of a cruise on the Betsy Northrup with 150 Harding High School students and 10 other presenters, Beth set up a station on stormwater & nonpoint source pollution. She presented six times to groups of 10-12 students on October 24th.

9. Beth did an outdoor presentation to Ms. Kortas' 10th grade science students about impervious surfaces and their effect on water quality prior to a stenciling event. Katie Galloway, FMR's Volunteer Coordinator, talked with the group about the threat of invasive species to plant diversity in the river gorge. Beth & Katie then supervised the group in a buckthorn seedling pull on the east side of the river gorge at Summit Avenue on October 15th.

10. On Friday, October 31st Beth did several demonstrations and an experiment related to impervious surfaces and their relationship to NPS pollution to Ms. Sundet's 3rd grade science class at Expo Elementary.

11. On Tuesday, October 21st Beth did an impervious surfaces experiment and NPS pollution presentation to 4th-6th grade students in Ms. Weiley's Discovery Club at Expo Elementary. The students stenciled the following week.

Teacher Workshops

In partnership with Cairn and Associates, FMR held a teacher workshop for Saint Paul public school teachers Wednesday, April 2, 2003. Initially, two sessions were offered (one full-day workshop with substitute teacher stipends available, or an after-school workshop) but the full-day session was cancelled due to low registration. An additional workshop was held Tuesday, September 30, 2003 for five teachers. Two other workshops on Wednesday, September 24th and Tuesday, October 28th were cancelled due to low registration. Workshops were promoted using the following means:

-Announcement at WaterShed Partners meeting
-Recruitment through SPPS Community Resource Specialists
-E-mail announcement to WaterShed partners e-mail list
-Flyer mailing to all SPPS teachers on FMR database
-Flyer mailing to 2002 Children's Water Festival participants
-Flyer mailing to fall 2002 & 2003 Big River Journey teachers
-Cairn's mailing list of 230 St. Paul Public School teachers
-E-mail to all SPPS science teachers from Gary Mansergh, SSPS Science Curriculum Coordinator
-Mailing to Eco Education teachers
-E-mail to Project Learning Tree teachers through Laura Duffey, coordinator
-Provided flyers for mailing to April Rust of DNR's Project WET
-E-mail from Marty Davis, SPPS BRJ contact
-Mailing to teachers who work with Sage Passi at RWMWD
-Announcement on MOEA's SEEK website
-Jo Colleran, City of Minnetonka Environmental Resource Coordinator
-Minnesota Runoff Association, UofM Extension
-Jan Welsh at DNR's Project WILD
-Notice in FMR's *Mississippi Messages*
-E-mail announcement to Fresh Force teachers from Mary Ellen Arvanitis
-Announcement on Ann Calvert's River Forum Items of Interest
-E-mail announcement to St. Paul Parks

Ten teachers registered for the April 2nd after school workshop and eight attended (four middle school teachers, three high school teachers and one special education teacher). Eight teachers registered for the September 30th workshop and five attended (three high school teachers, one environmental specialist, and one resource

specialist). The workshops were held at Hamline University's Law Graduate Conference Center for a reduced fee ($25) due to FMR's Watershed Partner affiliation. The room was large and comfortable. Hamline also provided a portable Mac computer lab for a fee of $20. Snacks & beverages were provided by FMR.

Beth did a presentation about the natural history of the Mississippi River, how European settlement effected the river, the current threat of urban run off containing nonpoint source pollutants, and ways residential landscaping & lawncare contribute to the problem of polluted run off. She also talked in detail about stenciling with classrooms and the extended in-class support available from Friends of the Mississippi River.

Rich and Beth led teachers in two ERG experiments and one demonstration related to impervious surfaces, the storm drain system, and polluted run off. Teachers then signed up for stenciling and extra education opportunities.

At both workshops 1 Environmental Resource Guide curricula were distributed, seven for grades 9-12 and six for grades 6-8. Teachers provided positive feedback related to the workshop and lingered afterward to talk with Rich about curriculum ideas and to Beth about stenciling & Extra Education possibilities.

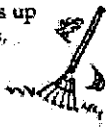
PLEASE DON'T POLLUTE
DRAINS TO
MISSISSIPPI RIVER

Have you seen this message near a storm drain?

Community volunteers have posted this message on storm drains in your neighborhood to remind you to keep pollutants off the streets, driveways and sidewalks and out of storm drains.

Storm drains are part of the storm sewer system which carries water from rainfall and snowmelt directly from your neighborhood to our local rivers, lakes, streams and wetlands.

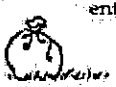
This water becomes polluted when it picks up things like grass clippings, leaves, pesticides, motor oil, trash and pet waste and flushes them into storm drains.



Remember ...

Never dump anything into a storm drain!

Stormwater is NOT treated by a waste-water treatment plant, and therefore it is a direct route for pollutants to enter our waterways.



What You Can Do ...

Use zero-phosphorus fertilizer and follow proper application procedures. Sweep spilled fertilizer off of paved surfaces.

Avoid pesticides and other lawn chemicals or use them responsibly - keep them off of paved surfaces.

Keep leaves and grass clippings out of the street - compost or bag them for disposal.

Keep your vehicle tuned up and clean up any oil leaks or spills from paved surfaces.

Wash your car on the lawn or at a carwash—not in the driveway or street.

Pick up pet wastes.

Don't litter.

Dispose of paint and other household hazardous wastes properly - NEVER down a storm drain!

For more information on how to dispose of or recycle yard trimmings and hazardous wastes...

Call 651/633-EASY

To volunteer for the storm drain stenciling project with Friends of the Mississippi River...

Call 651/222-2193

Co-sponsored by the City of St. Paul Public Works and Friends of the Mississippi River.

Printed on 30% post-consumer recycled paper

Artwork courtesy of Mara Wilgen and St. Paul Neighborhood Energy Consortium

Water Fest 2004

Celebrating Watershed Awareness & Clean Lakes

Saturday, May 22, 2004
10:00am to 3:00pm
Lake Phalen Park Pavilion

A Free Family Festival!

Continuous Activities

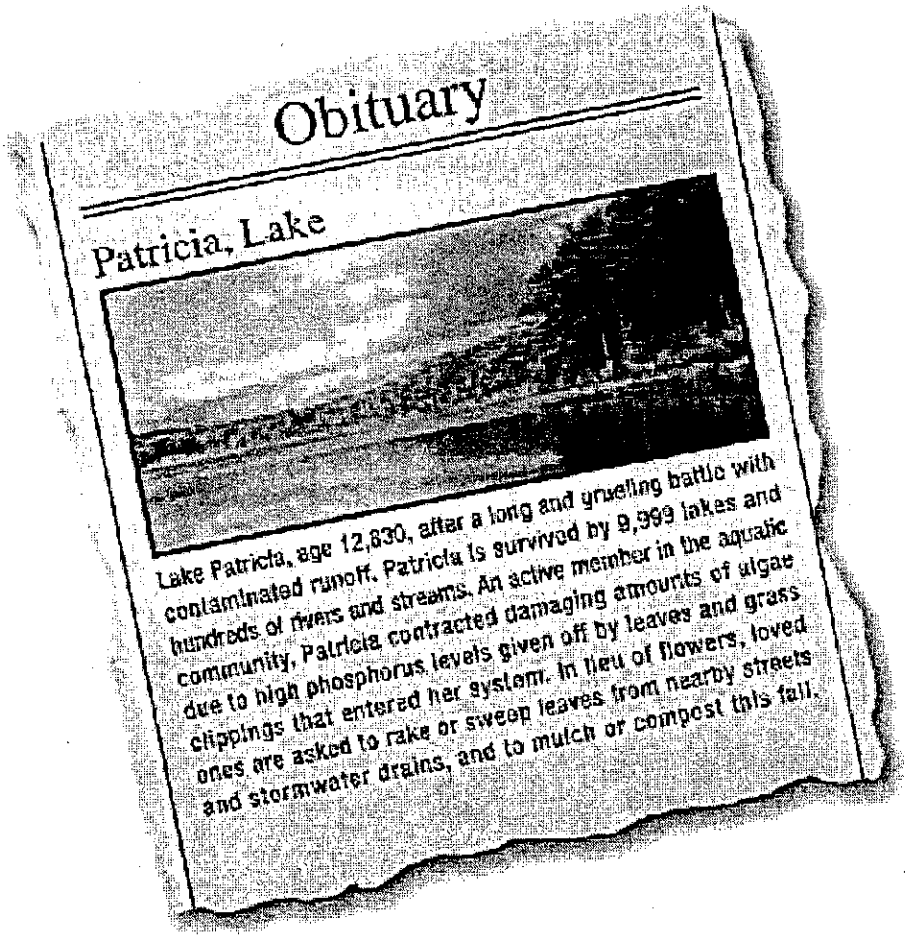
On the Water
- Floating classroom activities on pontoon boat
- Fishing lessons, turtle and fish demos
- Stream monitoring
- Voyageur canoe rides

Around the Lake Phalen Park Pavilion
- Student exhibits of artistic, scientific and service projects, landscaping and shorelands
- Watershed and ecosystem exhibits and games
- Clowns, face painting and skits
- Environmental computer games and indoor science projects
- Tackle Exchange for Get the Lead Out Campaign - Bring your lead fishing tackle
- Vactor Truck, Street Sweeper and Snow Plow demos

Amphitheater Schedule

10:30 Richardson School Pageant
11:00 Como Zoo Show
12:15 Celebration in Song and Recognitions
1:00 AirPlay Juggling Show

For more information, www.rwmwd.org or call 651-704-2089



Obituary

Patricia, Lake

Lake Patricia, age 12,630, after a long and grueling battle with contaminated runoff. Patricia is survived by 9,999 lakes and hundreds of rivers and streams. An active member in the aquatic community, Patricia contracted damaging amounts of algae due to high phosphorus levels given off by leaves and grass clippings that entered her system. In lieu of flowers, loved ones are asked to rake or sweep leaves from nearby streets and stormwater drains, and to mulch or compost this fall.

Waterfest

The City of Saint Paul is a sponsor of Waterfest, which is a family festival put on by the Ramsey-Washington Metro Watershed District. In 2003, the event was held on Saturday, May 17th at Lake Phalen. This was the fourth year of this event and the second year that it was held in Saint Paul. The Watershed District estimates that 1000 people attend this free family festival. The Parks Department is assisting in coordinating this event, which is being held in a City Park. The Public Works Department is providing a street sweeper to be on display for this event. A flyer for the 2004 event is included in the Appendix.

Appendix J

Pollutant Sources as Identified by the MPCA

MPCA Polluted Sites Inventory

This search was completed utilizing the MPCA web based resources available at

http://pca.state.mn.us/backyard/neighborhood.html

Detailed information regarding the types of sites in the lists or specific information about a site can be obtained from the web site. The following lists were obtained by searching all zip codes within the St. Paul corporate limits.

Minnesota Pollution Control Agency

Types of Sites Found:

CERCLIS

NFRAP

Federal Superfund Sites

State Superfund Sites

Delisted State Superfund Sites

Permitted Solid Waste Sites

State Assessment Sites

Unpermitted Dumps

Voluntary Investigation and Cleanup (VIC)

State Closed Landfill Sites

RCRA TSD Facilities

RCRA Investigation/ Cleanup Sites

This Web site contains PDF documents that require Adobe Acrobat for viewing.

MPCA Home > Your Backyard > What's in My Neighborhood?

What's in My Neighborhood?

Since the early 1980s when major federal and state cleanup programs were created, the Minnesota Pollution Control Agency has been aggressively searching for and helping to clean up contaminated properties. This Web page contains a searchable inventory of those properties.

The inventory includes properties that have already been investigated and cleaned up, as well as those currently enrolled in MPCA cleanup programs. Also included are properties that were suspected to be contaminated, but after investigation turned out to be clean.

Search the Database:

- How do I search for places that may be contaminated?

Background Information to Help You Understand What You'll Find:

- What types of properties are included in the inventory?
- What other information may be useful?
- What can I do with the information I get from the database search?
- What happens to properties that are contaminated?
- Does Minnesota have a lot of contaminated properties?
- Submit a suggested change to the inventory
- Downloading MPCA data
- Disclaimer

How do I search for places that might be contaminated?

The MPCA gives users two ways to search for places that may be contaminated.

Option 1. This interactive GIS-based viewer allows users to view sites by clicking on a map. This search tool also allows users to conduct searches by zip code, street address, city and several other methods.

Enter GIS-based search

Option 2. Users who prefer a text-based search, or have a slower Internet connection, may prefer to use the text-based search. This search tool allows searches by county, zip code, site type, and other options.

Enter Text-based search

What types of properties are included in the inventory?

People commonly think contamination comes only from big businesses and industries. But many of the properties in this inventory have been contaminated from sources such as leaking storage tanks and old municipal dumps.

Many of the properties listed have been investigated and/or cleaned up through the federal

or state Superfund program. Read about the successes of these programs in the Minnesota Superfund Annual Report. A good summary can also be found on the Superfund Environmental Indicator of the Month page.

Read the list below for definitions of the types of sites represented in the inventory.

- CERCLIS Sites (Comprehensive Environmental Response, Compensation and Liability Information System)
- NFRAP Sites (No Further Remedial Action Planned)
- Federal Superfund Sites (Federal Superfund, or National Priority List (NPL), sites)
- State Superfund Sites (State Superfund, or Permanent List of Priorities (PLP), sites)
- Delisted State Superfund Sites (Delisted State Superfund Sites, or Delisted PLP (DPLP), sites)
- Permitted Solid Waste Sites
- State Assessment Sites
- Unpermitted Dumps (Metro Dump Inventory (MDI), the Outstate Dump Inventory (ODI) and the Open Dump Inventory)
- Voluntary Investigation and Cleanup Sites (VIC)
- State Closed Landfill Sites
- RCRA TSD Facilities
- RCRA Investigation/Cleanup Sites

For more information read, the fact sheet on site types.

What other information might be useful?

Some environmental professionals conducting investigations look for additional types of information that cannot be found by searching this inventory. These items include:

Leaking Underground Storage Tank Sites
These are sites where petroleum contamination caused by leaking storage tanks systems may have impacted soil and/or water. Users can search for these leak sites through the MPCA's Minnesota Aboveground/Underground Storage Tank Sites page.

To learn more about specific sites, contact Dianne Mitzuk at 651-297-8499. Or learn more about this program on the Leaking Underground Storage Tank Program page.

Spills of Petroleum Products and/or Hazardous Substances
These are sites where a release has occurred, but cleanup took place soon after the incident and no further action is required. For information on these sites contact Dianne Mitzuk at the MPCA at 651-297-8499 or toll-free at 800-657-3864.

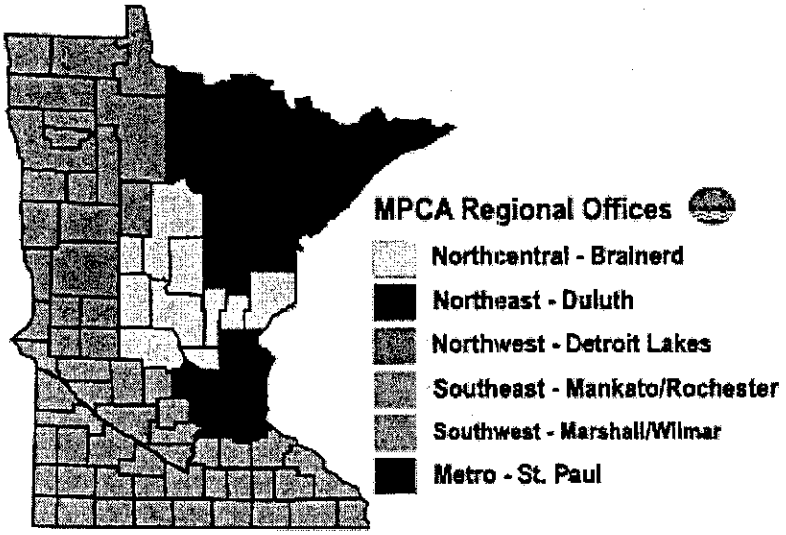
Generators of Hazardous Waste
These are facilities where normal business practices generate hazardous waste. To learn more about these types of sites in the Twin Cities metro area, contact the county office where that site is located:

- Anoka County: 763-422-7093
- Carver County: 952-361-1800

- Dakota: 952-891-7557
- Hennepin: 612-348-8100
- Ramsey: 651-773-4466
- Scott: 952-496-8475
- Washington: 651-430-6655

Or for sites located outside the seven county metro area call:

- Chisago, Isanti and Wright Counties: 651-296-3552
- Northcentral Region: 218-828-2492
- Northwest Region: 218-846-0472
- Northeast Region: 218-723-4795
- Southeast Region: 507-285-7343
- Southwest Region: 507-537-6380



The Toxics Release Inventory (TRI)
This inventory, which is published by the EPA, is a valuable source of information regarding toxic chemicals that are being used, manufactured, treated, transported, or released into the environment. Search the TRI on the Emergency Response Commission's Web site.

Agricultural Chemical Sites
To learn more about sites contaminated with agricultural chemicals, see the Minnesota Department of Agriculture (MDA) — What's In My Neighborhood Web site. WEB Or contact the MDA Data Practices and Records Manager at 651-297-3997.

Formerly Used Defense Sites (FUDS)

FUDS are properties or sites that were once owned, operated or leased by the federal government and used by one of the branches of the Department of Defense. Investigation and cleanup of contamination at these sites is conducted for the DoD by the U.S. Army Corps of Engineers. The MPCA oversees these cleanup activities through a Memorandum of Agreement between the state and DoD.

For more information about this program, please see the Corps FUDS Web page. For information on the MPCA's role in the FUDS Program, please call 651-296-6139 or e-mail gary.krueger@pca.state.mn.us.

What can I do with the information I get from the database search?

Depending on your needs, you can do the following with the information you obtain from your search:

- Identify locations with known or suspected environmental contamination as well as locations of facilities that are permitted to store or dispose of solid waste.
- Use the information for city planning, zoning and other community planning efforts.
- Use the information to teach students why it is important to reduce waste and the use of hazardous substances.
- Provide community groups with information they can use to prioritize and make recommendations about waste sites and land use choices.

What happens to properties that are contaminated?

Once a property or site is confirmed to be contaminated, it undergoes a thorough investigation to determine what type of cleanup is needed. Standards for cleanup differ depending on the location and possible future uses of the property.

Properties enter different cleanup programs depending on the type and source of the contamination found.

The properties identified as contaminated include a long list of properties, now known as "brownfields," that developers and lenders might normally pass up for development due to environmental concerns. This resulted not only in land that was underutilized, but contributed to urban sprawl as businesses looked for "clean" land to build on.

In 1992, the Land Recycling Act was enacted to facilitate cleanup and redevelopment of these properties by providing a process for developers to obtain streamlined approval of cleanup plans from the MPCA, as well as liability assurances to protect lenders and buyers from open-ended cleanup costs. These sites are handled by the Voluntary Investigation and Cleanup (VIC) Program.

Between 1988 and 2002 the VIC Program has overseen a total of 1,813 projects. Of those, 1,264 have been cleaned up; found acceptable for purchase, refinancing or redevelopment; or transferred to other programs for appropriate decision-making and actions.

Does Minnesota have a lot of contaminated properties?

After searching through this inventory, it may seem as if Minnesota has a lot of contaminated properties. While it is difficult to compare the number of contaminated properties in Minnesota with those in other states, there are three reasons for the large number of sites in this inventory.

First, Minnesota has been aggressively seeking out and cleaning up contaminated properties for a long time. The MPCA began these efforts in the early 1980s, soon after

the federal Superfund law was passed. Many states did not begin to seek out and cleanup properties until the late 1980s or early 1990s.

Second, Minnesota's inventory contains all properties that have been investigated, whether contamination was confirmed or not. In many states, inventories only contain sites with actual contamination.

Finally, programs that provide liability assurances, such as the VIC Program, have encouraged buyers, lenders and developers to identify potentially contaminated properties as candidates for cleanup and redevelopment. Because of this, many properties have been investigated that would normally be left untouched due to concerns about becoming liable for cleanup costs.

These efforts to identify and cleanup contaminated properties have paid off for Minnesota. Fewer and fewer sites are entering MPCA cleanup programs each year, while increasingly more sites are being cleaned up and returned to productive use.

For more information about trends and successes of Superfund, visit the Superfund Environmental Indicator of the Month page.

Downloading MPCA data

If you are interested in using MPCA data to create maps or perform other geographic-based functions, you will need to download all of the items in the zipped file below. In addition to the files, you will also need Geographic Information System (GIS) software.

If you are interested in placing MPCA data into a spreadsheet only, you will need the sites.dbf file from the zipped file below.

If you have any questions or comments, please contact Linda Moon at linda.moon@pca.state.mn.us.

Select the link below to download data.

- What's in My Neighborhood Data File (zip file)

Disclaimer

Maps generated through this Web site are to be used for display or planning purposes only. Data is not survey quality and therefore should not be relied upon as a basis for legal decisions. Search results and associated maps are created using the most recent data available to the agency.

A search of this database should not be considered sufficient to complete a Phase I investigation of the history or background of a site, or to meet requirements for environmental due diligence with regard to a site.

The State of Minnesota, the Minnesota Pollution Control Agency and employees assume no responsibility or liability to any person or entity for the use of this information. Any use of this information is made at the risk of the user.

This site will change as maps and applications are created and updated. Some of the map applications may be temporarily unavailable during data updates, system maintenance and

other related activities. Agency staff will work to restore the site as quickly as possible in the event of any disruptions. Your patience is greatly appreciated.

This page was last updated January 18, 2005

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Minnesota Pollution Control Agency

Preliminary Results

The following sites resemble the search information that you entered. To find out more information on the sites click on the site name or number.

Site ID	Site Name
VP10450	4TH AND CEDAR SITE
VP6120	BARBER ELECTRIC
VP11360	BLUE LOT
VP15580	CAPITOL SQUARE REDEVELOPMENT
MNMDI0000368	CITY OF ST PAUL STREET SWEEPING DUMP
VP18630	Crown Builders
VP14770	DAKOTA CONDOMINIUMS
VP8740	DEPARTMENT OF REVENUE
VP14220	DIAMOND PRODUCTS CO.
VP6890	EDGERTON STREET BRIDGE
VP7560	EMPIRE BUILDER A & B
VP6970	EMPIRE BUILDER CENTER
VP7700	EMPIRE BUILDER PARCEL C
VP3030	FORMER GREAT NORTHERN RAILROAD SITE
VP12470	FORMER ST PAUL UNION DEPOT PROPERTY
VP4360	G & K SERVICES
VP15890	Habitat for Humanity - Mississippi
VP18280	HRA "BLOCK 19" PARKING RAMP
VP13390	INDUSTRIAL CENTER
VP18930	Jackson Street Lofts
MNPT00003870	KELLOGG BLVD, PMA
MNPT00001780	KELLOGG BOULEVARD POST OFFICE
MNPT00002330	KELLOGG BOULEVARD SITE
MNMDI0000369	LAFAYETTE DEMOLITION (RON ROTH)
MNMDI0000365	LARPENTEUR-DESOTO DEMOLITION DUMP
MNPT00005310	MARKET STREET
MNPT00010070	MILLER & HOLMES, INC.
MNPT00010110	MISSISSIPPI & CAYUGA SITE
MNSW00000189	MWCC ASH DISPOSAL SITE
MNPT00005240	PHALEN CORRIDOR
VP19700	Phalen Senior Lofts
MNVP18980	Printer's Row
MNPT00014860	RASPBERRY ISLAND
mnpt00012630	RIVERVIEW IND'L. PARK #11 (PARCEL E-3)

VP18190	ROBERT ST. OFFICE BUILDING
MNPT00016990	ROSSMOR BUILDING
MND981528250	SAINT PAUL GAS MANUFACTURING SITE
MND058319807	SKYWAY QUICK PRINT
VP18340	STROH'S BREWERY BLDG #65
MNPT00015690	TWIN TOOL
MNSW00000151	UNITED WASTE TRANSFER STATION
MNPT00002420	VOMELA SPECIALTY COMPANY
MND980615736	VOPAK USA, INC.
MNPT00001200	WARNER/SHEPARD ROAD
MNSW00000593	WASTE NABAGENEBT-ST PAUL TRANSFER FACILI
MNPT00014180	WESTMINISTER JUNCTION
VP5980	WILLIAMS HILL

This page was last updated Feburary 25, 2005

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Minnesota Pollution Control Agency

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Site ID	Site Name
VP10300	560 RANDOLPH AVENUE SITE
MND000271684	ABEX CORP RAILROAD PROD GROUP
VP4480	ARNOLD BUILDING
VP3240	ASHLAND JAMES AVE
VP8860	BATTLE CREEK WETLAND
VP16250	CHESTNUT STREET PARCEL
VP9740	CIVIC CENTER ARENA
VP17480	DALE AND DAYTON
VP3380	DISTRICT ENERGY
VP1510	HARRIET ISLAND LOWER MARINA
VP2060	HARVEST STATES
VP16330	INDUSTRIAL STEEL CONTAINER CORP
VP17210	Island Station
mnpt00012280	KAPLAN H. S. SCRAP IRON CO.
MNPT00008800	KOCH/MOBIL
MNPT00007510	KOCH/MOBILE SITE
MNVP18970	Kroll Property
MNPT00003830	NSP GAS PIPELINE
MNPT00001750	NSP HIGH BRIDGE ASH
MNSW00000378	NSP HIGH BRIDGE SITE
MNMDI0000385	NSP HIGH BRIDGE-SURFACE IMPOUNDMENT
MNMDI0000895	NSP ISLAND ASH SITE
MNPT00012100	OSCEOLA PARK COOPERATIVE
MND981952112	REMACKEL SALVAGE SITE
MNPT00007320	SCIENCE MUSEUM
MNPT00001520	SHEPARD ROAD SITES
MNPT00013630	SIBLEY PARK APARTMENTS
MNPLP0000028	ST PAUL LEVEE PROPERTY
MNPT00008900	SUPER AMERICA #4420
MNPT00001590	UNISYS SHEPARD ROAD SITE
MNPT00009190	UNO-VON
MNPT00015450	UNOCAL - JAMES AVENUE

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Site ID	Site Name
VP10640	293 COMO SITE
VP13990	AUTO REPAIR
VP2810	BRANDT-JEN-KLUGE BUILDING
VP11260	CAPITOL OFFICE BUILDING
MNSW00000200	CHEMTRON CORPORATION LIME SLUDGE STORAGE
VP3230	CLARK OIL
VP3410/7600	COMO FOUNDRY
SR1005	ECOLOTECH
VP11290	FORMER ADDCO SITE
VP1870	GNB
MND006167381	LAVOPTIK CO INC
MNSW00000013	MIDWAY TRANSFER STATION
mnpt00012940	NEW SPIRIT CHARTER SCHOOL
MNPT00009480	OLD HOME FOODS
MNPT00010510	PMC SITE
MNPT00005831	RICE AND UNIVERSITY SITE
VP18450	Vasko Disposal Lease Area
MNSW00000574	VASKO RECYCLING & TRANSFER STATION
MNMDI0001564	VICTORIA & BLAIR DUMP SITE

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Site ID	Site Name
VP7520	1919 UNIVERSITY AVE
VP17470	3M AEROPSPACE PLANT
VP13250	AutoZone - University
VP6180	BONDED TRANSMISSION
VP4490	CAPITOL GEARS
VP0010	CO-OPERATIVE PLATING
VP12300	CONCORDIA AVENUE PROPERTY
VP9930	DAKOTA BANK
VP3660	DALE STREET RAILROAD YARD
MND981526403	DX BULK OIL STATION (FORMER)
VP19620	Flannery Construction
MNMDI0001562	GREAT NORTHERN RAILWAY SITE
VP3430	GRIGGS MIDWAY BUILDING
VP14170	GRIGGS-MIDWAY
VP8340	HAMLINE CLEANERS
VP3560	HARCOS CHEMICALS, INC.
VP7820	INSTITUIONAL ENVIRONMENTS
VP19650	Keys Parcel
MNPT00015040	KIPPERS COKE - US BANK
MNMDI0000439	KOPPERS COKE-HAMLINE
MNPT00005840	LAWRENCE SIGN
MNPT00016300	MBM PROPERTY
MNPT00005090	MCGILL/JENSEN
SR76	MCKAY MANUFACTURING ANDERSON ESTATE BLDG
MNPT00014330	MEGA FARMS
MNPT00001700	MIDWAY PLAZA
MNMDI0001563	MINNEHAHA AV & MILTON ST. DUMP
mnpt00012820	MINNEHAHA CLEANING CENTER
MNMDI0000444	MOWREY & COMPANY SURFACE IMP.
MND985701275	NSP GAS HOLDER
MNPT00009640	RAYMOND AUTO BODY
MNPT00005170	REMMELE ENGINEERING
MNMDI0000573	RHODIA CO.

MNMDI0000547	SHAFER CONSTRUCTION DEMO
MND980612667	SINCLAIR & VALENTINE CONSOLIDATED
MNPT00005180	SPRUCE TREE CENTRE
MNMDI0000440	STATE FAIR DEMOLITION
MNPT00010650	UNIVERSITY STRIP MALL
mnsw00000565	VEIT DISPOSAL SYSTEMS-RECYCLING & TRANSF
MNPT00002500	WARDS MIDWAY SITE
MNPT00014300	WELSH OFFICE/WAREHOUSE
VP1430	ZANE MAY

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Minnesota Pollution Control Agency

Preliminary Results

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Site ID	Site Name
VP13180	Fina #7525
MNPT00016530	MISSISSIPPI MARKET COOP
VP19740	Randolph Enterprises
MNPT00015950	ST. CATHERINE'S STUDENT CENTER

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Minnesota Pollution Control Agency

Preliminary Results

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Site ID	Site Name
VP19020	1611 Case Avenue
MNSW00000223	AIR REASEARCH
VP7140	ATLANTIC/CNW RAILROAD
MND006190813	B & H MACHINE CO INC
MND980614226	BURLINGTON NORTHERN DAYTONS BLUFF
MNMDI0000377	BURLINGTON NORTHERN SURFACE IMPOUNDMENT
VP12070	DAYTON'S BLUFF YARD (BNSF)
VP14160	DeFRANCHY'S & HOMAN'S SUB.
MNMD00001560	EAST MINNEHAHA & ETNA ST DUMP
VP1500	EXCELLO
VP12220	FORMER CHAMPION AUTO STORE
MND006187421	INDUSTRIAL STEEL CONTAINER CORP
MNMDI0000374	JOHNSON PARKWAY DUMP
MNMDI0001561	MARYLAND AV & MENDOTA ST SITE DUMP
MNSW00000292	MCES METROPOLITAN WWTP
MND000824011	MINNESOTA MINING & MANUFACTURING MAIN PL
MNPT00004960	MPR
MNPT00003090	NOBLES INDUSTRY
MNt280010851	NORTHERN MALLEABLE IRON CO
mnpt00012450	PARKWAY PLACE HOUSING PROJECT
MNMDI0000389	PIGS EYE LANDFILL
MNSW00000230	PIGS EYE WOOD RECYCLING CENTER
MNSW00000586	RAY ANDERSON AND SONS CO INC.
MNPT00008970	ST. PAUL/COMMERCIAL STREET
MNPT00015070	STANDARD OIL - COMMERCIAL STREET
MNPT00015540	STROH'S BREWERY NORTH
VP18950	SW Corner Maryland/Arcade
MNPT00004900	WESTWAY
MNPT00001030	WHIRLPOOL

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Site ID	Site Name
VP8920	218 OHIO ST
VP19810	335 Alpha Lane
VP18570	Alter Barge Site
SR94	AMDURA
MNMDI0000392	BARGE SLIP DEMOLITION SITE
VP5400	BELL COLD STORAGE
VP17140	BIDWEL MAINTENANCE SITE
VP6820	BROWN & BIGELOW
VP7900	CAPITAL CITY WELDING SUPPLY
VP10160	COLLINS COMMUNICATION (FORMERLY)
VP14000	DRAKE MARBLE
MNSW00000581	ECOLOGIC RECYCLING, LLC
VP6650	FOX CHEMICAL
VP17010	GREAT RIVER BOATWORKS
VP7020	GREEN TREE HANGAR
MNSW00000010	HIGH DENSITY BAILING PLANT
VP18330	HYDRALIFT-AMCLYDE
VP15080	JOSEPH'S RESTAURANT & BAR
MNSW00000466	KEITH KRUPENNY & SON DISPOSAL
MNSW00000579	KEITH KRUPENNY & SON DISPOSAL SERVICE
MNMDI0000382	KRAWCZEWSKI
MNPT00004890	MINI STORAGE
MNMDI0000394	MWCC ASH BASINS
MND980609101	NORTHWESTERN SHOT & LEAD
MND006149157	PIER FOUNDRY & PATTERN SHOP INC
MNPT00014110	PLATO BOULEVARD
MNMDI0000379	PORT AUTHORITY ASH SITE
MNMDI0000391	PROFORM HAZARDOUS WASTE DISPOSAL
MND061456547	PROFORM INC
MNPT00014100	REGENT AVIATION
MNPT00009840	RIDDER CIRCLE PROPERTIES
MNPT00006070	RIVERVIEW AREA WEST
MNPT00004350	RIVERVIEW BUSINESS PARK
MNPT00014520	RIVERVIEW IND. PARK E-2 (VIKING)

MNPT00007540	RIVERVIEW INDUSTRIAL N-1
mnpt00013770	RIVERVIEW INDUSTRIAL PARK #11
mnpt00012320	RIVERVIEW INDUSTRIAL PARK - LOTS C4 & C5
MNPT00008370	RRB ASSOCIATES
MNPT00016980	SCANLAN INTERNATIONAL
MNPT00013140	ST PAUL DOWNTOWN AIRPORT-H/C HANGER
MNPT00002980	ST. PAUL FC PROJECT #2
VP5920	STATE STREET DUMP
MNPT00015270	STATE STREET VACANT LAND
MNPT00001240	TECHNICAL SEALANTS
MNSW00000107	TWIN CITES REFUSE TRANS & RECYCLING FAC.
MNPT00006940	UNITED HEALTH CARE HANGAR
MNPT00003610	UNITED POSTAL SERVICES-VMF
MNPT00001670	UNOCAL DEWATER
MNPT00013820	US BANK - ST PAUL
MNPT00009260	VACANT BUILDING -2
mnpt00013050	WABASHA BUSINESS CENTER
17880	West Side Community Health Services
MNPT00014340	WEST SITE FLATS

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Minnesota Pollution Control Agency, 520 Lafayette Road, St. Paul, MN 55155-4194
Phone: 651-296-6300, 800-657-3864; 24-hour emergency number: 651-649-5451 or 800-422-0798; TTY: 651-282-5332, TTY 24-hour emergency number: 651-297-5353 or 800-627-3529

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Site ID	Site Name
VP11090	1125 ENERGY PARK DRIVE SITE
VP10290	ARIES PRECISION SHEET METAL
VP2420	ATRIUM OFFICE BLDG & NO 7 W RAMPS
VP16970	BANDANA SQUARE
VP9340	BRISSMAN-KENNEDY
VP6210	BURLINGTON APARTMENTS
VP2130	CARPENTER'S SCHOOL
VP8810	CEMSTONE PRODUCTS
VP13700	CHILDREN'S HOME SOCIETY
VP8730	CHILDREN'S MUSEUM
MNMDI0001565	COMO AV & PACKARD STREET DUMP
VP4210	ELM PROPERTIES
VP6381	ENERGY PARK PARCELS A-C
VP6380	ENERGY PARK PARKING LOT
VP12540	ENERGY PARK PLACE
VP12430	ENERGY PARK PLAZA
VP2430	ENERGY PARK WEST SITE
VP4740	ENERGY TECHNOLOGY CENTER
VP5610	GENERAL FOAM
VP7130	GOODWILL INDUSTRIES
VP12400	GORTNER PARKING RAMNP, U OF M
VP2720	GREATER HURON DEVELOPMENT CORP.
VP13760	H.B.FULLER (ST. Paul)
VP2490	INDUSTRIAL AIR SYSTEMS
VP12500	KOCH TRUCKING, INC
VP16760	LAPHAM-HICKEY STEEL SITE
MNMDI0001566	LARPENTEUR AV & FERNWOOD ST. DUMP
VP18160	LITHO SPECIALTIES
VP5550	MINIKAHDA MINI STORAGE
VP12080	MINNESOTA WIRE & CABLE
VP17130	NORTH PARKING RAMP (BANDANA SQUARE)
VP13030	QUALITY METALS, INC
VP19560	Sarita Wetland Forebay
MNVP19040	St. Paul campus Chiller Project

VP17310	ST. PAUL CHILLER PLANT
VP16700	US BANK STORMWATER POND
SR44	VALENTINE CLARK CORP
VP10600	WORUM CHEMICAL COMPANY

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Site ID	Site Name
VP15880	95 Empire Drive
MNMDI0000443	ADM LINSEED OIL, EPOXIDES SPILL
VP18070	CMS HARTZELL
VP2390	CSM
VP4310	ENERGY PARK VACANT LOT
VP6810	FISHER NUT FACILITY
MNPT00011591	FLEXOPACK FACILITY (FORMER)
VP3260	GNB - BERRY STREET
VP4870	HAMPDEN BLDG
MNPT00010990	MEL'S DIRECT SERVICE TRUCK STOP
MNPT00010180	METRO TRANSIT SNELLING GARAGE
mnpt00015800	MIDWAY AREA DEVELOPMENT
MNPT00007790	MIDWAY SUBSTATION
MNMDI0000442	NATIONAL MOWER COMPANY
MNPT00011040	OFFICE/WAREHOUSE BUILDING SITE
MNPT00007230	OLSON GRAPHIC PRODUCTS
MNPT00015480	PROSPECT AUTO PARTS
MNPT00008440	QUALITY TOOL
SR14	SCHNITZER IRON & METAL CO
MNPT00008070	SPECIALITY MANUFACTURING
MNMDI0000441	STANDARD STORAGE BATTERY COMPANY
MNPT00006950	TCT - DRILLER'S BUILDING
MNPT00013420	TWIN CITY CASTINGS
MNPT00001630	TWIN CITY TESTING
MNPT00009760	UNIVERSITY CROSSING
MNPT00011590	VACANT BUILDING - 1
MNPT00002230	WESTGATE
VP6500	WYCLIFF STREET

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Site ID	Site Name
MNMDI0000550	ABANDONED DUMP - 1
SR24	FORD MOTOR CO TWIN CITIES ASSY PLT
VP7780	HIGHLAND SHOPPING CENTER
MNPT00007420	LOCKHEED MARTIN
MND000823922	LORAL
MNPT00011050	MR. MOVIES BUILDING
MNMDI0000448	ST. PAUL AVENUE DUMP
VP4700	TEXACO REFINING SAINT PAUL TERMINALS

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Site ID	Site Name
mnodi0001642	BATTLE CREEK MIDDLE SCHOOL DUMP
VP5230	BULK SERVICES
MNSW00000075	CENTURY DISPOSAL TRANSFER STATION
MNMDI0000375	CLAPP-THOMPSON DEMOLITION DUMP
MNMDI0001559	EAST 7TH & HAZEL AVE DUMP
MNMDI0000376	FISH HATCHERY DUMP
VP0100	MAPLEWOOD DUMP
MNMDI0000378	NSP BATTLE CREEK FLY ASH
MNMDI0000210	PETROLEUM LANE
mnpt00015530	PINE TREE PARK APARTMENTS
MNPT00007550	RED ROCK - PARCEL A
MNPT00004320	ROSEWOOD ESTATES
MNPT00007530	ST PAUL YARD EXPANSION

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MPCA Leaking Aboveground / Underground

Storage Tank Sites

Minnesota Aboveground / Underground Storage Tank Search Result

The following sites resemble the search information that you entered. To find out more information on the sites click on the leak ID number

Leak ID	Site Name	County
3741	BALDINGER BAKING CO	Ramsey
2242	BROOKS FOOD MARKET	Ramsey
3174	COLLEGE OF SAINT CATHERINE	Ramsey
3046	EXCHANGE HIGH-RISE	Ramsey
3124	HILLCREST BRAKE AND ALIGNMENT	Ramsey
3002	JEWISH COMMNUNITY CENTER	Ramsey
3233	MIDLAND HILLS COUNTRYCLUB	Ramsey
3809	MONTGOMERY WARD	Ramsey
3810	MONTGOMERY WARD	Ramsey
3812	MONTGOMERY WARD	Ramsey
3861	NORTH STAR STEEL CO	Ramsey
2995	SNELLING GARAGE (MTC)	Ramsey
3232	UNOCAL	Ramsey
3003	WHEELOCK SCHOOL	Ramsey
525	TEXACO SALES TERMINAL	Ramsey
376	CLARK OIL TERMINAL	Ramsey
388	AMOCO SS# 8558 (MCKINNON)	Ramsey
379	HOLIDAY STATION STORE #82	Ramsey
110	(CHILDRENS PLACE - FORMER AMOCO)	Ramsey
61	INDEPENDENT SCHOOL DISTRICT #622	Ramsey
244	AMOCO SS #8753	Ramsey
378	Right of Way for Lauries Gas	Ramsey
10132	SCHNITZER IRON & META CO	Ramsey
41	TRACY OIL CO	Ramsey
83	HAYDEN HEIGHTS ELEMENTARY SCHOOL	Ramsey
928	PEOPLES PLUS	Ramsey
336	SUPERAMERICA #1351	Ramsey
338	SUPERAMERICA #1358	Ramsey
375	Q SUPERETTE	Ramsey
670	(FORMER POLYMETAL PRODUCTS SITE)	Ramsey
185	MOBIL OIL SNELLING & I94 SERVICE #05MJ	Ramsey
321	CITY OF SAINT PAUL	Ramsey
109	AMOCO SS #5194	Ramsey
361	SAINT THOMAS SEMINARY	Ramsey
100	AMOCO SS #5285	Ramsey
359	SAINT THOMAS COLLEGE - MCNEELY HALL	Ramsey
4209	BURLINGTON NORTHERN RAILROAD CO	Ramsey
211	MN DOT TRANSPORTATION BUILDING	Ramsey

265	PHILLIPS SS 8459	Ramsey
1662	PORTEC-INC-AREA 1	Ramsey
1663	PORTEC-INC-AREA 3	Ramsey
355	AMOCO SS #5336	Ramsey
602	FORMER PROTEX INDUSTRIAL	Ramsey
6207	FORMER MOBIL OIL LUBE PLANT	Ramsey
520	Q PETROLEUM	Ramsey
443	UNOCAL HIGHLAND PARK SERVICE	Ramsey
519	Q PETROLEUM	Ramsey
522	Q PETROLEUM	Ramsey
653	RAPID OIL CHANGE	Ramsey
523	Q PETROLEUM	Ramsey
652	RAPID OIL CHANGE	Ramsey
712	AMOCO SS# 5090	Ramsey
662	OLSONS RANDOLPH STATION INC	Ramsey
706	MOBIL OIL CORP	Ramsey
798	WESTGATE	Ramsey
817	HATVEDT DUANE	Ramsey
884	CEMSTONE	Ramsey
893	WINTZ TRUCK LEASING	Ramsey
1021	HIGHLAND CAR WASH	Ramsey
935	SAINT PAUL DOWNTOWN AIRPORT	Ramsey
936	CLARK SERVICE STATION #305	Ramsey
1964	BURLINGTON NORTHERN RAILROAD	Ramsey
1046	TRANS AUTO INC (MCGUGAN)	Ramsey
1025	ALCS GROUP INC	Ramsey
1027	MATTSON ERIC	Ramsey
1078	MINNESOTA AIR NATIONAL GUARD MSP	Ramsey
1272	WEATHERIZATION RESEARCH INC	Ramsey
1071	MIKES TEXACO SERVICES	Ramsey
1105	BUD & ALS BRAKE REPAIR	Ramsey
1159	SEVEN ELEVEN STORE	Ramsey
1183	G N B CO	Ramsey
1182	MARSDEN MAINTENANCE CO	Ramsey
1196	G BARTUSCH PACKING	Ramsey
1215	SIMONSONS TRUCK STOP	Ramsey
3835	WALDORF PALLET BUILDING	Ramsey
1254	SEVEN ELEVEN #17040	Ramsey
1253	SEVEN ELEVEN #17687	Ramsey
1261	SEVEN ELEVEN	Ramsey
1420	WHITAKER BUICK	Ramsey
1273	WHITTAKER BUICK	Ramsey
1291	SAINT PATRICKS CHURCH	Ramsey
1346	SAINT ROSE OF LIMA SCHOOL	Ramsey
1376	BAILEYS MARKET	Ramsey
1474	KNOX LUMBER	Ramsey
1500	SUPERAMERICA #4414	Ramsey
1501	SUPERAMERICA #4415	Ramsey
1502	SUPERAMERICA #4418	Ramsey
1602	CONTROL DATA	Ramsey
1605	3M WAREHOUSE	Ramsey
1627	UPDATE CO THE	Ramsey

1680	H E I/WALDORF	Ramsey
1659	LAWS GARAGE	Ramsey
1804	MIDWAY CHEVROLET INC	Ramsey
1802	SUBURBAN CHRYSLER-PLYMOUTH	Ramsey
1930	UNOCAL 76	Ramsey
1901	CLAIR'S AUTOMOTIVE SERVICE	Ramsey
1931	HAAS AUTO BODY	Ramsey
1952	WALDORF CORPORATION	Ramsey
2092	PLATING INC	Ramsey
1966	RENTAL PROPERTY	Ramsey
2396	BECKMAN PRODUCE INC	Ramsey
2079	3M BUILDING 56 (MAIN PLANT)	Ramsey
2051	HARVEST STATES COOP GREEN FACILITY	Ramsey
3798	DAKOTA BARGE	Ramsey
7275	FORMER TEXACO STATION	Ramsey
2422	GILLETTE COMPANY	Ramsey
1998	CLEVELAND AMOCO	Ramsey
2040	CONCORDIA COLLEGE	Ramsey
2211	METZ BAKING	Ramsey
5233	BURLINGTON NORTHERN RAILROAD CO	Ramsey
2365	TURRITTOS PIZZA	Ramsey
2394	SUN RAY SHOPPING CENTER	Ramsey
2384	PIPE LINE OIL CO	Ramsey
2475	SUPERAMERICA #4001	Ramsey
2450	UNIVERSITY OF MINNESOTA (OFFICE BLDG)	Ramsey
2425	SUPERAMERICA #4054	Ramsey
2695	MUNICIPAL EQUIPMENT GARAGE	Ramsey
3072	LENS AUTOMOTIVE	Ramsey
2546	SAMARITAN HOSPITAL	Ramsey
2580	PAPER CALMENSON & CO	Ramsey
2737	SUPERAMERICA #4030	Ramsey
2590	UNOCAL	Ramsey
2644	US WEST FACILITY	Ramsey
2893	INDUSTRIAL AIR SYSTEMS	Ramsey
2812	EVERS FLOWERS	Ramsey
2911	SUPERAMERICA #4038	Ramsey
2921	UNITED PARCEL SERVICE	Ramsey
2931	PARKWAY ELEMENTARY SCHOOL	Ramsey
2991	HERTZ RENT A CAR MSP	Ramsey
3009	ARIES SERVICE CENTER	Ramsey
3007	WALDORF CORPORATION	Ramsey
3016	REDEEMERS ARMS	Ramsey
3079	STOCKSTEAD PROP	Ramsey
3064	OLD DUTCH FOODS INC	Ramsey
3083	CHURCH OF THE HOLY CHILD	Ramsey
3243	3M BUILDING 71	Ramsey
3276	SUPERAMERICA #4039	Ramsey
3286	OLD DERHAM HALL HIGH SCHOOL	Ramsey
3326	CEMSTONE PRODUCTS CO	Ramsey
3373	FLOWERS BY KOHNER & FREDERIC	Ramsey
3370	SCHMIDT BREWING CO	Ramsey
3387	BUSINESS TECH CENTER	Ramsey

3396	TOWN & COUNTRY CLUB	Ramsey
3440	TARGET	Ramsey
3510	JOHNNY'S ROLLOFF SERVICE	Ramsey
3504	JR WALKER AND SONS INC	Ramsey
3520	CITY OF SAINT PAUL	Ramsey
3518	SOUTH SAINT PAUL POST OFFICE	Ramsey
3606	HARTZELL CORPORATION	Ramsey
3631	BROWN & BIGELOW INC	Ramsey
3767	FARRELLS AUTO SALES	Ramsey
3722	PAYNE AVENUE CLINIC	Ramsey
3725	ANCHOR PAPER CO	Ramsey
3760	SMALL ENGINE REPAIR	Ramsey
3852	UNISYS CORPORATION MIDWAY	Ramsey
3920	US WEST	Ramsey
3858	COUNTRY CLUB MARKET	Ramsey
4173	WABASHA DEVELOPMENT	Ramsey
3876	SUPERAMERICA #4032	Ramsey
3881	DISPOSAL SYSTEMS	Ramsey
3904	UNISYS CORPORATION	Ramsey
3897	INDUSTRIAL AIR SYSTEMS	Ramsey
3937	LLOYDS AUTOMOTIVE SERVICE	Ramsey
4022	MOUND PARK APARTMENTS	Ramsey
4011	AMOCO (FORMERLY FT ROAD MOBIL)	Ramsey
4017	AMOCO SS #2087	Ramsey
4809	FINASERVE #604-1449-609	Ramsey
4099	CHURCH OF SAINT GREGORY	Ramsey
4113	OLD AUTOBODY SHOP	Ramsey
4179	CAPPIES TRUCKING	Ramsey
4201	TWIN CITY TRANSPORT & RECOVERY	Ramsey
4281	MONTGOMERY WARD	Ramsey
4245	IMMACULATE HEART OF MARY SCHOOL	Ramsey
4242	TWIN CITY AUTO PAWN	Ramsey
4301	HIGHWOOD HILLS ELEMENTARY SCHOOL	Ramsey
4313	NOVICK'S SUPER SERVICE	Ramsey
4319	US POSTAL SERVICE-AIRMAIL FAC. MSP	Ramsey
4323	GALTIER ELEMENTARY SCHOOL	Ramsey
4347	CHURCH OF SAINT ANDREW	Ramsey
4353	RICHARDSON ELEMENTARY SCHOOL	Ramsey
4370	SAINT PAUL DOWNTOWN AIRPORT	Ramsey
4622	MINI PAC	Ramsey
4458	SAINT PAUL DOWNTOWN AIRPORT - EQUIP GA	Ramsey
4482	U.S. POSTAL SERVICE	Ramsey
5503	3M BUILDING 39-MAIN PLANT	Ramsey
4502	3M HOLMAN FIELD HANGAR (BLDG 670)	Ramsey
4598	MISTER DONUT	Ramsey
4882	SELBY COMMONS	Ramsey
4609	3M BENZ BUILDING	Ramsey
4576	MOVIE STATION	Ramsey
4573	AMOCO SS #5070	Ramsey
4579	CHELSEA HEIGHTS ELEMENTARY SCHOOL	Ramsey
4589	EAST SIDE GARAGE	Ramsey
4709	MTC - OVERHAUL BASE	Ramsey

9081	WILLIAMS HILL REDEVELOPMENT AREA	Ramsey
4678	BLESSED SACRAMENT SCHOOL	Ramsey
5012	BICHIK PRODUCTS INC	Ramsey
4770	AMOCO SS #5161	Ramsey
5095	SELBY COMMONS	Ramsey
4853	GARYS SERVICE STATION	Ramsey
4834	NEAR INC.	Ramsey
4894	LEXINGTON HILL APTS	Ramsey
4893	DUNNS STATION	Ramsey
4917	QUALITY PARK PRODUCTS	Ramsey
4930	COMO FOUNDARIES/ MAXON STEEL	Ramsey
4927	TILSNER BUILDING	Ramsey
4954	FUEL OIL SERVICE CO INC	Ramsey
4980	ADM GRAIN ELEVATOR	Ramsey
5050	HILLCREST GOLF COURSE	Ramsey
6573	ALTER SCRAP YARD	Ramsey
5071	EXECUTIVE CAR CARE	Ramsey
5826	KOCH PIPELINES INC	Ramsey
5114	SAINT PAULS PRIORY	Ramsey
5119	CITY OF SAINT PAUL - STREET MAINTENANC	Ramsey
5230	TOTAL PETROLEUM #2421	Ramsey
5264	DRAKE MARBLE COMPANY	Ramsey
5349	HOLMAN FIELD/AVIATION SUPPORT FACILITY	Ramsey
5280	U.S. POST OFFICE/INDUSTRIAL STATION	Ramsey
5328	SAINT PAUL WATER UTILITY STOREYARD	Ramsey
5363	TRUCK ENGINEERING	Ramsey
5360	WEST SIDE AUTO SERV INC (CLOSED)	Ramsey
5429	3M SAINT PAUL DISTRIBUTION CENTER	Ramsey
5484	FORT SNELLING	Ramsey
5455	SCHELEN AUTO ELECTRIC INC	Ramsey
5614	US ARMY RESERVE CENTER	Ramsey
5584	U.S. POSTAL SERVICE	Ramsey
5527	UNIVERSITY OF SAINT THOMAS	Ramsey
5542	RICE STREET POST OFFICE	Ramsey
5551	RYDER STUDENT TRANSPORTATION LOC#1759	Ramsey
5572	SAINT PAUL DOWNTOWN AIRPORT (IFT)	Ramsey
5587	RYDER STUDENT TRANSPORTATION	Ramsey
5637	WAREHOUSE SITE	Ramsey
5684	SAINT PAUL RAMSEY HOSPITAL	Ramsey
5677	COUNTRY CLUB MARKET	Ramsey
5698	METRO SQUARE	Ramsey
5749	SPRUCE TREE CENTER	Ramsey
5707	FORMERLY CLARK STATION	Ramsey
6142	UNO-VEN	Ramsey
5805	THOMPSON LIGHTNING PROTECTION INC	Ramsey
5770	FITNESS CENTER (FORMER GAS STATION)	Ramsey
6168	FORMER EAST KELLOGG TRAIN DEPOT	Ramsey
5814	HOSPITAL LINEN SERVICES	Ramsey
5843	METZGER BUILDING MATERIALS CO	Ramsey
5845	UNIVERSITY OF MN/CENTRAL LIBRARY	Ramsey
5865	JEBCO PROPERTY	Ramsey
5902	MARSDEN BUILDING MAINTENANCE	Ramsey

5870	DELUXE CHECK PRINTERS	Ramsey
5942	HAMLINE UNIVERSITY LAW BLDG	Ramsey
5904	FISHER NUT COMPANY	Ramsey
5912	TANK FARM (MTC)	Ramsey
5920	FACE TO FACE HEALTH & COUNSELING	Ramsey
5947	JAMES CASANOVA PROPERTY	Ramsey
5977	KOPPY TRUST	Ramsey
5989	KELLER CONSTRUCTION	Ramsey
6010	CONAGRA FLOUR MILL	Ramsey
9082	MAXIM TCT DRILLERS BUILDING	Ramsey
6098	DISTRICT ENERGY ST PAUL INC	Ramsey
6151	NW AIRLINEBLDG B-MAIN BASE MSP	Ramsey
6213	TWIN CITY ENGINE REPAIR	Ramsey
6229	AMOCO SS #5091	Ramsey
6222	HILLCREST COUNTRY CLUB	Ramsey
6348	HARTZELL MANUFACTURING	Ramsey
6373	FORD MOTOR COMPANY	Ramsey
6398	MTC GARAGE	Ramsey
6456	EAST SAINT PAUL YMCA	Ramsey
6479	SUPERAMERICA #4409	Ramsey
6470	CENTURY AVE COLLISION CENTER	Ramsey
6514	SINCLAIR SERVICE	Ramsey
6534	GENERAL FOAM OF MINNESOTA INC	Ramsey
6556	GOODWILL/EASTER SEALS	Ramsey
6561	SUPERAMERICA #4426	Ramsey
6605	HOFFMAN CORNER OIL CITGO STATION	Ramsey
6621	MINN AIR Ntnl GUARD TANK 801 MSP	Ramsey
6619	SUPERAMERICA #4040	Ramsey
6639	UNION BRASS METAL MANUFACTURING	Ramsey
6641	LE PAINTER	Ramsey
6648	WESTWAY TRADING	Ramsey
6663	MINN AIR NTNL GUARD BASE MSP	Ramsey
6668	MN/DOT CENTRAL SHOP	Ramsey
6684	MINN AIR NTNL GUARD TANK 411 MSP	Ramsey
6686	MINN AIR NTNL GUARD TANK 591MSP	Ramsey
6692	HOLY SPIRIT CHURCH	Ramsey
6769	RYDER COMMERCIAL TRUCK LEASING	Ramsey
6810	RAMSEY COUNTY RECYCLING CENTER	Ramsey
6838	CITGO SERVICE	Ramsey
6856	PEFCO	Ramsey
6879	AMERICAN NATIONAL CAN CORP	Ramsey
6877	M & H GAS	Ramsey
6878	AMERICAN NATIONAL CAN CO	Ramsey
7190	PIPE LINE OIL	Ramsey
6985	WINGS INC	Ramsey
7691	MILLER BUILDING	Ramsey
6980	TOTAL PETROLEUM STORE #2411	Ramsey
6984	TOTAL STATION #2418	Ramsey
6981	GATSBYS REAR PARKING LOT	Ramsey
7267	AMOCO SS #5057	Ramsey
7015	METROPOLITAN WASTEWATER TREATMENT PLAN	Ramsey
7014	AMERICAN NATIONAL BANK BUILDING	Ramsey

7067	SEARS & ROEBUCK #1052	Ramsey
7053	DEPARTMENT OF COMMERCE BUILDING	Ramsey
7103	CUSTOM ROCK INTERNATIONAL	Ramsey
7110	MN MOTOR VEHICLE FLEET SERVICE BLDG	Ramsey
7189	SINCLAIR STATION	Ramsey
7234	FORMER BILLS ECONOMY GAS	Ramsey
7246	WINKLER PROPERTY	Ramsey
7253	NORTH STAR STEEL CO	Ramsey
7280	CARL BOLANDER & SONS CO	Ramsey
13899	Olive and Olmsted Utility Street Project	Ramsey
7461	AMOCO SS #2005	Ramsey
7498	SECURE MINI-STORAGE	Ramsey
7399	MIKES BAR	Ramsey
7415	WEST SIDE SERVICE/FORMER GAS STATION	Ramsey
7430	FORMER KEMPF PAPER FACILITY	Ramsey
7437	SAINT FRANCIS DESALES SCHOOL	Ramsey
7488	JLT MIDWAY MAINTENANCE #25	Ramsey
7492	DAYTONS BLUFF CONSTRUCTION SITE	Ramsey
7481	LEAGUE OF MN CITIES (FORMER GARAG)	Ramsey
7513	HOLIDAY STATIONSTORE #43	Ramsey
7565	UNITED CHILDRENS HOSPITAL	Ramsey
7569	E-Z RECYCLING	Ramsey
7622	FARM & GROUNDS MAINTENANCE BUILDING	Ramsey
7639	RIVER ROAD CONDOMINIUMS	Ramsey
7664	GODES LOT	Ramsey
7644	CLARK STATION	Ramsey
7982	ROYS PHILLIPS 66 SERVICE	Ramsey
7687	MINNESOTA AIR NATIONAL GUARD MSP	Ramsey
7701	MINN AIR NTNL GUARD 133AW/EM MSP	Ramsey
7707	HAMLINE UNIVERSITY PHYSICAL PLANT	Ramsey
7760	MIDWAY HOSPITAL	Ramsey
7823	FINA STATION 7525	Ramsey
7830	CAPTAIN KEN'S FOODS INC	Ramsey
7852	ROBERTS APARTMENTS	Ramsey
7896	RICE STREET CAR WASH INC	Ramsey
7941	UNITED ELECTRIC	Ramsey
7953	740 RIVER DRIVE APARTMENTS	Ramsey
8105	MIDWAY NATIONAL BANK	Ramsey
7979	MN AIR NATIONAL GUARD 133AW/EM	Ramsey
8029	VALVOLINE RAPID OIL CHANGE	Ramsey
8022	CENTRAL SERVICE FACILITY PARK	Ramsey
8035	EAST SIDE SERVICE	Ramsey
8046	CARE INSTITUTE INC	Ramsey
8063	HIGHLAND MAINTENANCE BUILDING	Ramsey
8070	VALVOLINE INSTANT OIL CHANGE	Ramsey
8076	WATERGATE MARINA	Ramsey
8093	SUPERAMERICA #4413	Ramsey
8139	MINNEHAHA TAVERN	Ramsey
8192	KSTP TV BROADCASTING	Ramsey
8202	ISD #622 BUS GARAGE	Ramsey
8230	CAPITOL GEARS	Ramsey
8207	HHH JOB CORP CENTER Heat Plant	Ramsey

8218	ALL AMERICAN STORAGE (FORMER BULK FAC)	Ramsey
8219	BELL COLD STORAGE	Ramsey
8231	BERSING RESIDENCE	Ramsey
8273	COOP PLATING CO	Ramsey
8316	FORMER PARKWAY 66	Ramsey
8318	HAZEL PARK MOBIL	Ramsey
8331	METALCOTE GREASE & OIL CO	Ramsey
8354	HOLIDAY STATIONSTORE #31	Ramsey
8384	JLT PROPERTIES	Ramsey
8368	VALVOLINE INSTANT OIL CHANGE	Ramsey
8406	WILDER FOUNDATION	Ramsey
13912	Future Salvation Army Site	Ramsey
13903	Balion Co	Ramsey
8464	AMERICA NATIONAL BANK OF SAINT PAUL	Ramsey
8490	GUSTAPHSON RESIDENCE	Ramsey
8505	VACANT BUILDING	Ramsey
8683	CEMSTONE PRODUCTS CO	Ramsey
13970	Union 76	Ramsey
8549	NOREN RESIDENCE	Ramsey
8554	SUPERAMERICA #4420	Ramsey
8595	JLT GROUP	Ramsey
8598	ROHL TRANSMISSION	Ramsey
8613	PRECISION TUNE	Ramsey
8668	CLEVELAND TERRACE	Ramsey
14022	Weinhagen Tire Co	Ramsey
8738	MILLER & HOLMES INC	Ramsey
8749	MAIN FUEL TANK-ST PAUL YD ROUND HOUSE	Ramsey
8825	COACH RD JOB	Ramsey
8827	AMERICAN CAN CO	Ramsey
8830	HOLIDAY STATIONSTORE #4	Ramsey
8834	STATE OF MINNESOTA TRAVEL MANAGEMENT	Ramsey
8879	AVON PLACE CONDOMINIUMS	Ramsey
8922	LORRAINE APARTMENTS	Ramsey
8980	UNITED WASTE TRANSFER SYSTEMS	Ramsey
8974	U OF M BRUCE BUILDING	Ramsey
8991	FORMER GAS STATION	Ramsey
8992	FORMER GAS STATION	Ramsey
9004	BRO-TEX CO INC	Ramsey
9019	OLD HOME FOODS INC	Ramsey
9044	M & H GAS	Ramsey
9121	AUTO MAX	Ramsey
9061	WENDYS RESTAURANT	Ramsey
9071	AMOCO SS #5235	Ramsey
9077	FORMER FOX CHEMICAL	Ramsey
9100	HOLIDAY STATIONSTORE #5	Ramsey
9133	SUPERAMERICA #4151	Ramsey
9110	ST PAUL YARD - YARD OFFICE	Ramsey
9138	SUPERAMERICA #4023	Ramsey
9140	UNITED WASTE TRANSFER	Ramsey
9163	HEDSTROM RESIDENCE	Ramsey
9175	HOLMAN FIELD	Ramsey
9223	HIGHLAND REPAIR SERVICE	Ramsey

9237	T A SCHIFSKY & SONS INC	Ramsey
9270	HOLIDAY STATIONSTORE #43	Ramsey
9264	TEMPLE OF AARON	Ramsey
9267	CALVARY CEMETERY	Ramsey
9345	TRUCK TERMINAL/GARAGE (SEE 13240)	Ramsey
9341	LATUFF BROS	Ramsey
9383	MELS TRUCK STOP	Ramsey
9417	MACALESTER COLLEGE	Ramsey
9509	VAN DYKE APARTMENTS	Ramsey
9460	FIRESTONE STORE	Ramsey
9467	FLAG BUILDERS	Ramsey
9473	MIDWAY EXPRESS CAR WASH	Ramsey
9535	WALDORF CORP	Ramsey
9611	RIHM MOTOR CO	Ramsey
9644	METROPOLITAN STATE UNIVERSITY	Ramsey
9669	DONOVAN CONSTRUCTION CO	Ramsey
9735	INSTITUTIONAL ENVIRONMENTS INC	Ramsey
9865	HIGHLAND SHOPPING CENTER	Ramsey
9727	MN STATE FAIRGROUNDS	Ramsey
9866	HIGHLAND SHOPPING CENTER	Ramsey
9775	HEWLETT PACKARD CO	Ramsey
9772	ELWAY SERVICE STATION	Ramsey
9823	ROLLINS OIL CO	Ramsey
9889	GOODYEAR GARAGE	Ramsey
9894	VACANT LOT	Ramsey
9871	FORMER GAS STATION	Ramsey
9952	MIDWEST JOBBERS TERMINAL INC	Ramsey
12241	WORUM CHEMICAL CO	Ramsey
9926	HOLIDAY STATION 45	Ramsey
9942	AMERICAN FREIGHTWAYS TERMINAL	Ramsey
10299	FORMER PRECISION TUNE	Ramsey
10155	RODECKI RESIDENCE	Ramsey
11166	VACANT LOT	Ramsey
10067	JERRY'S SERVICE CENTER	Ramsey
10107	U-HAUL CENTER #72952	Ramsey
10098	YORKSHIRE GROVE APTS	Ramsey
10119	PHALEN PARK SERVICE	Ramsey
12002	ANCHOR BLOCK CO	Ramsey
10203	LEXINGTON APARTMENTS	Ramsey
10135	ALASKAN TRANSFER	Ramsey
10189	BARIBEAU RESIDENCE	Ramsey
10206	PCCR COMMUNITY CARE CENTER	Ramsey
10578	FORMER WAX AND WORKS	Ramsey
10241	ELMHURST CEMETERY	Ramsey
10248	FORMER K-MART/BUILDERS SQUARE BLDG	Ramsey
10263	KSTP TV BROADCASTING	Ramsey
10561	U OF M GOLF COURSE	Ramsey
10581	HARVEST STATES COOP	Ramsey
11030	BURNSPLACE APTS	Ramsey
10753	ELWAY SERVICE STATION	Ramsey
10644	LUND AND LANG FLORISTS	Ramsey
10650	PROP DEPARTMENT OF REVENUE SITE	Ramsey

10649	PROP DEPARTMENT OF REVENUE SITE	Ramsey
10718	STATE OF MN TRAVEL MGMT	Ramsey
10768	AMERICAN RED CROSS	Ramsey
10760	BROWN & BIGELOW INC	Ramsey
10774	HAZELWOOD APARTMENTS	Ramsey
10827	MONTGOMERY WARD	Ramsey
10873	ROCK TENN COMPANY	Ramsey
10950	BUILDING B TEST CELL AREA MSP	Ramsey
10952	CITY OF SAINT PAUL MUNICIPAL GARAGE	Ramsey
10892	OLSON QUICK FOOD MART	Ramsey
10901	RAMSEY CO WORKHOUSE	Ramsey
13907	JC Penny	Ramsey
11013	600 SELBY AVE	Ramsey
10967	BUDGET TRUCK RENTAL	Ramsey
11072	JIFFY MART	Ramsey
11015	JIFFY MART	Ramsey
10965	SINCLAIR #22053	Ramsey
10985	POULTRY TEACHING RESEARCH FACILITY	Ramsey
11000	THE PARK APARTMENTS, KIPLING BLDG	Ramsey
11005	ESTATE OF DENNIS SCANLAN	Ramsey
11004	TWIN CITY NEWSPAPER	Ramsey
13909	Empire Dr and Park Site	Ramsey
11039	RANDOLPH STREET PROPERTIES	Ramsey
11051	WAREHOUSE MN BREWERY CO	Ramsey
13288	Lang Brothers Reality	Ramsey
11061	MACALASTER PLYMOUTH UNITED CHURCH	Ramsey
13105	RAILROAD OR BUDGET TOWING PROPERTY	Ramsey
11085	SEWALL GEAR CO	Ramsey
11103	SHIELY CO	Ramsey
11104	ARAMARK BOOK DIVISION	Ramsey
12431	MIDWAY RENTAL	Ramsey
11120	MEDICINE LAKE LINES	Ramsey
11138	ARTKES MARKET	Ramsey
11151	FORMER HARDEES	Ramsey
11155	PRO STOP	Ramsey
11175	THE PHOTO SHOP	Ramsey
11801	ALAMO CAR RENTAL MSP	Ramsey
11193	PHILLIPS STATION #8459	Ramsey
11287	HERTZ RENT A CAR MSP	Ramsey
11208	RICE & LARPENTUER 66	Ramsey
11220	AVANTI STORE	Ramsey
13910	Old Bank Building	Ramsey
11333	FEDERAL EXPRESS	Ramsey
11416	JOHNSON BROS LIQUOR	Ramsey
11530	FOOD-N-FUEL C11	Ramsey
11873	FORMER MNDOT & FAIRGROUNDS	Ramsey
11566	ARCHDIOCESE OF ST. PAUL	Ramsey
14019	Food N Fuel	Ramsey
11755	HOLMAN FIELD	Ramsey
11627	AUTO CLINIC INC	Ramsey
11634	ST PAUL HUMP YARD	Ramsey
11654	OUR LADY OF GOOD COUNSEL	Ramsey

11716	METRO AUTO	Ramsey
11713	BERWALD ROOFING INC	Ramsey
11738	BRADLEY RESIDENCE	Ramsey
11834	ROCK TENN CO	Ramsey
11768	SUPERAMERICA 4419	Ramsey
11781	RETARDER TOWER SITE	Ramsey
14054	RC Avionics	Ramsey
11818	SUPERAMERICA 4426	Ramsey
14021	Avanti Store No 5667	Ramsey
11932	ADVANCE SHORING EQUIP CO	Ramsey
12060	ANCHOR BLOCK CO	Ramsey
12058	LAURIE GAS	Ramsey
12086	IOWA HIGHRISE	Ramsey
12103	GEORGES 66	Ramsey
12107	ALTER BARGE CO	Ramsey
12409	FORMER GAS STATION	Ramsey
12123	MOUNDS PARK QUICK STOP	Ramsey
12177	DUNEDIN HIGH RISE	Ramsey
12156	NSP HIGH BRIDGE GENERATING PLANT	Ramsey
12216	SEWALL GEAR	Ramsey
12292	HIWAY FEDERAL CREDIT UNION	Ramsey
12325	KEYS WELL DRILLING	Ramsey
13129	MUNICIPAL EQUIPMENT GARAGE	Ramsey
12433	HAMLINE UNIVERSITY BOILER HOUSE	Ramsey
14020	Oakland Cemetery Assc	Ramsey
12371	CENTRAL HIGH RISE	Ramsey
12395	MIDWEST JOBBERS TERMINAL	Ramsey
12282	WESTWAY TERMINAL CO-I	Ramsey
12283	WESTWAY TERMINAL CO II	Ramsey
12462	FORMER NORTHSTAR OIL CO	Ramsey
12464	MR TIRE SERVICE CENTER	Ramsey
12467	CONCORDIA COLLEGE	Ramsey
12499	MINNESOTA JET INC	Ramsey
12476	NSP RICE STREET SERVICE CENTER	Ramsey
12584	FORMER GREAT NORTHERN RAILROAD	Ramsey
12493	HOLIDAY INN I 94 EAST	Ramsey
12560	LEWIS ANIMAL HOSPITAL	Ramsey
12580	CLEVELAND HIGHRISE	Ramsey
12640	EAST SIDE COLLISION CENTER	Ramsey
12593	SUNNY MINI MARKET	Ramsey
12670	METRO SQUARE LOT 2	Ramsey
15802	Shaw Stewart Lumber Co	Ramsey
12626	WILDER FOUNDATION	Ramsey
12683	BUDGET RENT A CAR MSP	Ramsey
12695	SPEEDY MARKET #2	Ramsey
13174	Victoria Parking	Ramsey
12704	WILBURS AUTO SERVICE	Ramsey
12733	METROPOLITAN TRANSIT COMM/OVERHAUL BAS	Ramsey
12707	WENDYS DOGHOUSE	Ramsey
12740	FORMER PREMIERE IMPORTS	Ramsey
12735	HILLCREST SHOPPING CENTER	Ramsey
12763	U OF M BIOLOGICAL SCIENCES CENTER	Ramsey

12927	MIXON INC	Ramsey
12980	FORMER GRAND SMITH MOBIL (NOW AAA)	Ramsey
12999	U OF M BAILEY HALL	Ramsey
13016	EMERALD POINT APARTMENT	Ramsey
13113	FORMER GAS STATION AND DRY CLEANERS	Ramsey
13318	Former Dry Cleaners	Ramsey
13814	Roys 66 Service	Ramsey
13283	State Administartion Bldg Capitol Comple	Ramsey
13269	St. Paul Plant	Ramsey
13323	Concord Texaco	Ramsey
13441	U of MN Archives Building	Ramsey
13374	Roseville Properties	Ramsey
13425	Denison Property	Ramsey
13462	Midway Shopping Center	Ramsey
13589	Boys Totem Town	Ramsey
13677	Former Parker Residence	Ramsey
13602	Port Authority Property	Ramsey
13817	Proposed US Bank Site	Ramsey
13862	Capital Brake	Ramsey
13672	Standard Property	Ramsey
13684	Holiday Inn River Center	Ramsey
13708	Port Authority Property	Ramsey
13726	Former Car Dealership	Ramsey
13805	H B Fuller Co	Ramsey
13776	Sholom Home East	Ramsey
13839	United Rentals	Ramsey
13800	Lagos Property	Ramsey
14044	University of Minnesota	Ramsey
13813	Amoco Station No 5091	Ramsey
13822	Rockwood Place Apartments	Ramsey
14027	Quebecor Printing	Ramsey
14181	Filmore Corner Parking Lot	Ramsey
13882	Essex on the Park Condo Development	Ramsey
13881	Sibley Park Apartments	Ramsey
14017	Church of St Mathew	Ramsey
14047	Josephs restaurant	Ramsey
14053	St. Paul Downtown Airport	Ramsey
14179	Holiday Inn Expo Center	Ramsey
14218	Highland Shopping Center	Ramsey
14304	Highland Shopping Center	Ramsey
14200	Holiday Station #7	Ramsey
14199	Paper, Calmenson & Company	Ramsey
14236	Cashill Apartment BLDG	Ramsey
14175	Jiffy Lube	Ramsey
14271	Stoltz Cleaners	Ramsey
14315	Brac's Auto Parts	Ramsey
14275	Saxon Ford	Ramsey
14280	Sinclair Store	Ramsey
14291	Vocational & Technical Ed Garage	Ramsey
14330	SuperAmerica Store # 4039	Ramsey
14335	Gloria Dei Lutheran Church	Ramsey
14638	SuperAmerica Store 4419	Ramsey

14420	Now Bikes and Fitness	Ramsey
14414	Hamline Autobody	Ramsey
14442	SuperAmerica Store No 4356	Ramsey
14564	Aries Service Center	Ramsey
14459	HHH Job Corp Center	Ramsey
14460	Hubbard Broadcasting Inc	Ramsey
14476	SuperAmerica No 4428	Ramsey
14495	SuperAmerica Store No 4358	Ramsey
14486	City of St. Paul Public Works	Ramsey
14527	Larand International	Ramsey
14513	District Energy	Ramsey
14546	Burger King	Ramsey
14552	Hallman Oil	Ramsey
14556	Ramsey County Law Enforcement Cente	Ramsey
14559	Union Pacific RR Fuel Yard	Ramsey
14563	Patton Residence	Ramsey
14603	St. Paul Campus Heating Plant	Ramsey
14602	Metro Transit East Garage	Ramsey
14657	Daytons Bluff Housing Property	Ramsey
15174	Wrecker Services Center	Ramsey
14769	Macalester College	Ramsey
14781	Former Residence	Ramsey
14875	East Side Garage	Ramsey
14822	Grudem Building	Ramsey
14816	HealthEast	Ramsey
14821	MN Diversified Industries	Ramsey
14867	Former Midway Transfer	Ramsey
14855	MNDOT Central Headquarters	Ramsey
14858	G and R Rebuilding Co Inc	Ramsey
14866	St. Paul Academy Drake Arena	Ramsey
14991	Metropolitan State library	Ramsey
14910	SuperAmerica Store No 4601	Ramsey
14958	SuperAmerica Store No 4421	Ramsey
14959	Home for Learning	Ramsey
14957	SuperAmerica Store No 4409	Ramsey
14995	Manor Restaurant Parking Lot	Ramsey
15016	Wellington Group Property	Ramsey
15100	SuperAmerica Store No 4023	Ramsey
15077	Great River Boat Works	Ramsey
15098	Insty Lube	Ramsey
15099	Alter Barge	Ramsey
15127	DHS Office Building	Ramsey
15132	Hamline University	Ramsey
15134	Joes Sporting Goods	Ramsey
15151	Goodyear Auto Service Center No 6921	Ramsey
15194	St. Paul Airport Holman Field	Ramsey
15311	Metro Transit Overhaul Center	Ramsey
15212	Shaw Lumber Company	Ramsey
15222	Grand Hil LLC	Ramsey
15237	Holman Field	Ramsey
15348	Mai Village	Ramsey
15354	Former Auto Dealership	Ramsey

15351	SuperAmerica Store No 4038	Ramsey
15371	St. Paul Escort Inc	Ramsey
15532	Million Air Hanger	Ramsey
15360	Whirlpool Building 17	Ramsey
15439	Tri Art Inc	Ramsey
15434	U of MN Fleet Services Farm and Ground	Ramsey
15676	Kroll Property	Ramsey
15689	Former Knox Lumber	Ramsey
15661	Labens Flowers Inc	Ramsey
15664	Richardson Residence	Ramsey
15683	Kieselbach Residence	Ramsey
15703	St. Paul Warehouse	Ramsey
15711	Vacant Lot	Ramsey
15754	Taco Stand	Ramsey
15841	White Castle	Ramsey
15777	United and Childrens Hospital	Ramsey
15882	West Side Flats or Llewellyn Worldwide	Ramsey
15799	William Mitchell School of Law	Ramsey
15842	Former Service Station	Ramsey
15829	Minnesota Public Radio	Ramsey
15857	Phalen Blvd Construction Phase 2	Ramsey
15860	CDC St. Thomas	Ramsey
15896	East Side Auto Repair	Ramsey
15915	Holiday Inn Parking Ramp	Ramsey
15916	Grand Wheeler Sinclair	Ramsey
3743	(FORMER) IDEAL SECURITY	Ramsey
2591	3M / MACHINE SHOP BUILDING #98	Ramsey
3490	3M BUILDING 216	Ramsey
1803	3M SAINT PAUL ABRASIVES- MAIN PLANT	Ramsey
12207	3M SAINT PAUL MAIN PLANT	Ramsey
829	3M-SAINT PAUL DISTRIBUTION	Ramsey
1683	7UP-RC BOTTLING CO	Ramsey
487	A 1 DRAIN OIL	Ramsey
1288	AM HOIST	Ramsey
1905	AMERICAN LINEN	Ramsey
885	AMERICAN SEMI PARTS & SERVICE	Ramsey
1899	AMOCO SS #5135	Ramsey
978	AMOCO SS #5220	Ramsey
286	AMOCO SS #5238	Ramsey
149	AMOCO SS# 5016	Ramsey
703	AMOCO SS# 8529	Ramsey
249	AMOCO-JERRYS MARSHALL & SNELLING	Ramsey
2411	ANCHOR BLOCK CO	Ramsey
2228	ARROW PONTIAC	Ramsey
2935	ASSUMPTION CHURCH	Ramsey
14686	Ashland Chemical	Ramsey
1014	BANK PROPERTY	Ramsey
8957	BARTUSCH MEAT PACKING	Ramsey
1631	BATTLE CREEK JUNIOR HIGH SCHOOL	Ramsey
2658	BERGLUND LUMBER	Ramsey
9057	CAPITAL GEARS INC	Ramsey
1117	CARSON PIRIE SCOTT	Ramsey

417	CENTRAL HIGH SCHOOL SERVICE STATION	Ramsey
529	CHURCHILL TRUCK LINES INC	Ramsey
317	CITGO - TARGET (MIKE CARDINAL)	Ramsey
715	CITY OF SAINT PAUL	Ramsey
1217	CITY OF SAINT PAUL-ALDINE ST	Ramsey
1274	CITY OF SAINT PAUL-PUBLIC WORKS	Ramsey
1801	CITY OF SAINT PAUL-SYLVAN/ACKER SEWER	Ramsey
3650	CITY OF SAINT PAUL/DEMOLITION SITE	Ramsey
2306	CLARK SERVICE STATION #1131	Ramsey
1898	CLARK SERVICE STATION #294	Ramsey
1390	CLEVELAND JUNIOR HIGH SCHOOL	Ramsey
756	COLLEGE OF SAINT CATHERINE	Ramsey
1297	COLLEGE OF SAINT THOMAS	Ramsey
8955	COMMERCIAL TRUCKING & LEASING INC	Ramsey
5219	COMO FOUNDRY PARTNERS/ MAXON STEEL	Ramsey
1541	COMO PARK CONSERVATORY	Ramsey
1443	COMO SENIOR HIGH SCHOOL	Ramsey
3323	CRAZY LOUIS	Ramsey
1043	DART PRO STOP	Ramsey
808	DAYTON HUDSON	Ramsey
2060	ELWAY SERVICE STATION	Ramsey
913	FINA MART #572 (TEXACO STATION)	Ramsey
10700	FORD MOTOR CO	Ramsey
3262	FORD MOTOR COMPANY	Ramsey
5343	FORD MOTOR PLANT (CONVOY CO)	Ramsey
12247	FORD MOTORS TWIN CITY ASSEMBLY PLANT	Ramsey
2053	FORMER CLARK OIL	Ramsey
532	FORMER SERVICE STATION	Ramsey
733	FORMER STUDEBAKER GARAGE (RAUSCHNOT)	Ramsey
6469	FORMERLY SINCLAIR RETAIL	Ramsey
1080	FUEL OIL SERVICE CO	Ramsey
13320	G and K Services Inc	Ramsey
914	GLOBE INDUSTRIES	Ramsey
2453	HAFFNERS RESTERAUNT	Ramsey
567	HASSETT OIL CO	Ramsey
12244	HAWKINS CHEMICALS INC	Ramsey
12245	HAWKINS TERMINAL 2	Ramsey
3257	HIGHLAND CHATEAU NURSING HOME	Ramsey
1304	HIGHLAND ELEMENTARY SCHOOL	Ramsey
1225	HIGHLAND PARK JUNIOR HIGH	Ramsey
761	HILLCREST CAR WASH	Ramsey
1868	HISTORICAL SOCIETY BLDG	Ramsey
1085	HUMBOLDT JR HIGH	Ramsey
791	IDEAL SECURITY HARDWARE	Ramsey
4568	INSTY PRINT	Ramsey
1366	JEFFERSON ALTERNATIVE SCHOOL	Ramsey
368	JOHN MUELLER	Ramsey
3181	K MART #3059	Ramsey
5560	KOCH ASPHALT CO	Ramsey
642	LEAMINGTON REAL ESTATE	Ramsey
1054	LEX & LARP 66 SERVICE (FRENCH)	Ramsey
223	LLOYDS SINCLAIR	Ramsey

1343	MANN ELEMENTARY SCHOOL	Ramsey
3353	MAPLEWOOD TRUCK STATION (MNDOT)	Ramsey
2993	MAXON BUILDING #4	Ramsey
3551	MCGILL-JENSEN INC	Ramsey
2587	MET SEWAGE REGULATOR SITE	Ramsey
1234	METRIC IMPORT AUTO PARTS WHSE	Ramsey
12275	METROPOLITAN WASTEWATER TREATMENT	Ramsey
3096	METROPOLITAN WASTEWATER TREATMENT PLAN	Ramsey
4071	METROPOLITAN WASTEWATER TREATMENT PLAN	Ramsey
3563	MN DOT - FAIRGROUNDS	Ramsey
971	MNDOT - 35E	Ramsey
182	MOBIL PARK SERVICE INC #05MAO	Ramsey
1805	MODERNISTIC DIE CUTTING INC	Ramsey
3811	MONTGOMERY WARD	Ramsey
400	MONTGOMERY WARD	Ramsey
495	MULTI-CLEAN	Ramsey
2407	MURRYS MOTOR CAR COMPANY	Ramsey
13900	Macalester College	Ramsey
13411	Minnesota Brewing Co	Ramsey
2446	NCI/HARVEST STATES COOP	Ramsey
66	NELSON OIL CO - BULK PLANT	Ramsey
2305	NORTHSTAR STEEL	Ramsey
13193	Nor Lakes	Ramsey
1510	OPEN SCHOOL	Ramsey
2431	PARK SERVICE INC (05MAO)	Ramsey
1428	PHALEN LAKE ELEMENTARY SCHOOL	Ramsey
2767	PHILLIPS 66	Ramsey
2080	PLASTICS INC	Ramsey
1064	PORT AUTHORITY CITY OF SAINT PAUL	Ramsey
1664	PORTEC-INC-AREA 4	Ramsey
2506	PUMP & SHOPPE	Ramsey
404	Q SUPERETTE	Ramsey
5204	QUEBECOR PRINTING	Ramsey
1542	REGENT AVIATION	Ramsey
1084	RIVERVIEW ELEMENTARY	Ramsey
2412	ROSE HILL SERVICE	Ramsey
489	SAINT JOSEPHS HOSPITAL	Ramsey
2927	SAINT MATHEWS CHURCH	Ramsey
891	SAINT PAUL CAMPUS LIBRARY (U OF M)	Ramsey
4314	SAINT PAUL ESCORT INC	Ramsey
4545	SAINT PAUL PORT AUTHORITY	Ramsey
3261	SAINT PAUL RAMSEY MEDICAL CENTER	Ramsey
3574	SAINT PAUL RAMSEY MEDICAL CENTER	Ramsey
601	SAINT PAUL VOC TECH INST	Ramsey
48	SAINT PAUL WATER UTILITY	Ramsey
2845	SINCLAIR RETAIL	Ramsey
3228	SINCLAIR RETAIL	Ramsey
158	SMITH EZ STOP	Ramsey
1332	SPARTAN GROUP	Ramsey
4089	SPUR STATION #4413	Ramsey
2684	STATE CAPITAL POWER COMPLEX	Ramsey
1593	STONE CONTAINER CORPORATION	Ramsey

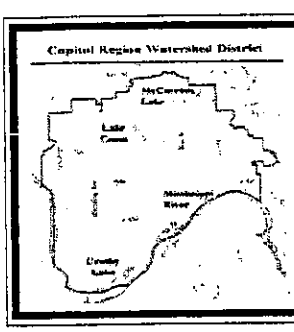
650	SUN OIL (OLIN)	Ramsey
340	SUPERAMERICA #1355	Ramsey
3202	SUPERAMERICA #4020	Ramsey
668	SUPERAMERICA #4031	Ramsey
339	SUPERAMERICA #4356	Ramsey
337	SUPERAMERICA #4359	Ramsey
14150	Stroh Brewery Company	Ramsey
5432	TACO BELL #2142	Ramsey
2355	TOTAL PETROLEUM	Ramsey
2351	TOTAL PETROLEUM	Ramsey
5594	TOTAL TOOL,INC	Ramsey
1807	TWIN CITY TESTING CORPORATION	Ramsey
6883	UNOVEN ST PAUL BULK TERMINAL	Ramsey
3617	US WEST	Ramsey
3665	VICTORY PARKING INC	Ramsey
14642	Volpack	Ramsey
783	WAGNER CORP	Ramsey
12262	WALDORF CORP(ROCK-TENN CO)	Ramsey
4068	WALDORF CORPORATION	Ramsey
9179	WHOLE FOODS PARKING LOT	Ramsey
1204	WOLF PROPERTIES (EARL SCHEILE)	Ramsey
3928	WOODBRIDGE PROJECT	Ramsey
300	ZANE MAY (FORMER SPACE CENTER)	Ramsey
2232	ZAPPPA EXCAVATION	Ramsey

This page was last updated August 30, 2004

If you have suggestions on how we can improve this site, or if you have questions or problems, please contact us.
If you have questions or problems, contact webmaster@pca.state.mn.us
Minnesota Pollution Control Agency, 520 Lafayette Road, St. Paul, MN 55155-4194
Phone: 651-296-6300, 800-657-3864; 24-hour emergency number: 651-649-5451 or 800-422-0798; TTY: 651-282-5332, TTY 24-hour emergency number: 651-297-5353 or 800-627-3529

Appendix K

Arlington Pascal Storm Water Improvement Project Information



Arlington Pascal Storm Water Improvement Project

Fall 2004

Public Meetings to be Held on November 1st & 9th, 2004

Public Meeting on Monday, November 1st,
7:00-8:00 pm at Chelsea Heights Elementary School Cafeteria – 1557 Huron St., St. Paul.

Public Meeting on Tuesday, November 9th,
7:00-8:00 pm at Northwest Como Rec Center Gymnasium – 1550 N Hamline Ave., St. Paul.

The Capitol Region Watershed District will hold an informational meeting on November 1st and November 9th to update the public on the Arlington Pascal Storm Water Improvement project, present the project components being considered and respond to questions.

Specific information that will be presented at the meeting includes:

- Update of studies completed;
- Schedule for the project;
- Description of the storm water improvements.

The meeting will use the following format:

- 7:00 – 7:30 there will be an Open House with Display Boards with text and graphics;
- 7:30 – 8:00 Formal Presentation describing the project with a question and answer session.

The purpose of the meeting is to solicit comments regarding the storm water improvements under consideration, and to promote public understanding of the over all project goals.

Project Update

On June 30th the CRWD conducted an open house to display and explain the three major components that the watershed district will be implementing for the Arlington Pascal Storm Water Improvement Project. At that meeting, many residents expressed concern over a proposed storm water pond to be located at the southeast corner of Arlington and Hamline. Currently the watershed district is considering design alternatives for the Arlington/Hamline ponding area to address neighborhood concerns. *(update con't on back)*

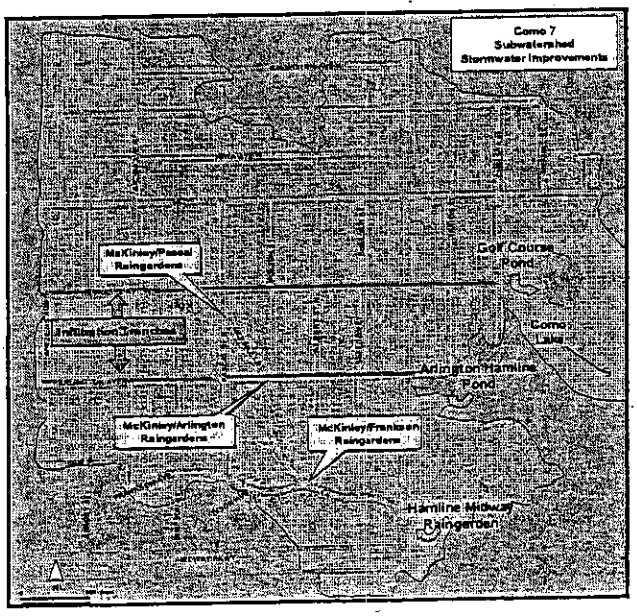
For more information visit our website at:
www.capitolregionwd.org

Project Summary
Arlington Pascal Storm Water Improvement Project

The Cities of St. Paul, Roseville and Falcon Heights along with Ramsey County and the Capitol Region Watershed District (CRWD) formed a partnership in 2003 to conduct an evaluation of the Como 7 Sub-Watershed. Now referred to as the Arlington Pascal Storm Water Improvement Project. This sub watershed of Como Lake is roughly bounded by Snelling Avenue on the west, Midway Parkway on the south, Roselawn to the north and Como Park on the east.

The goals of the project were:

1) Reduce the frequency and duration of flooding in the sub-watershed and adjacent sub-watersheds because of Como 7 overflows;
2) Address needed improvements in the storm sewer pipes within the sub-watershed;
3) Improve water quality by reducing the amount of phosphorous that reaches Como Lake; and
4) Determine an equitable distribution of costs for any necessary improvements. *(con't on back)*



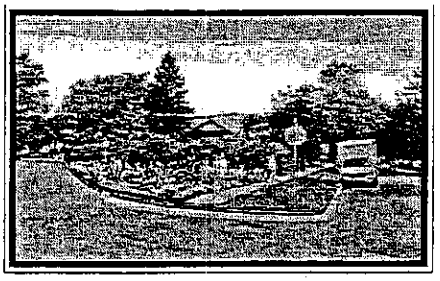
Arlington/Pascal Storm Water

Fall 2004

Project Summary (con't)

The results of the evaluation provided a plan to reduce the frequency and duration of flooding in watershed and Midway Parkway while at the same time improving water quality in Como Lake. These goals are accomplished through an improved drainage system, ponding areas, rainwater gardens and infiltration trenches.

The watershed district is now working with the City of St. Paul Public Works Department to plan and design several rainwater gardens on McKinley St. and infiltration trenches along Arlington and Nebraska Avenues as part of the Arlington/Pascal Residential Street Vitality Program. In addition to these improvements, the CRWD is working with the Division of Parks and Recreation to construct water quality improvements in Como Park.

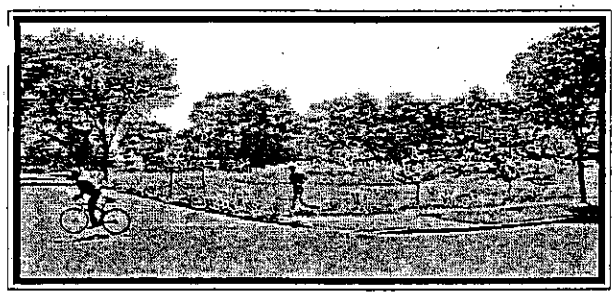


Rain Garden #3 at McKinley & Frankson

(update con't from page 1)

Any alternative design will still need to meet the overall project goals of reducing flooding and improving water quality while at the same time addressing neighborhood and Parks concerns.

While many of the comments expressed at the meeting were directed towards the proposed Arlington/Hamline pond, the watershed district did receive many favorable comments regarding the overall project. The watershed district will present alternative plans for the Arlington Hamline area. The district is considering two alternatives for the Southeast corner of Arlington and Hamline. One alternative is a pond on underground stormwater storage system.



Proposed Pond at South East corner of Hamline and Arlington

Underground storage – Alternative Arlington/Hamline intersection looking Southeast

Capitol Region Watershed District

1410 Energy Park Dr., Suite 4
St. Paul MN 55108

Contact Information:
Mark Doneux, District Coordinator
(651) 644-8888
mark@capitolregionwd.org
www.capitolregionwd.org

Appendix L

Individual Sewage Treatment Systems (ISTS) Information

On-Site Wastewater Disposal Facilities

General

Within the City of Saint Paul, there are approximately 200 homes utilizing individual on-site facilities for disposal of their wastewater. The map included in this appendix shows the locations of the existing septic systems within the City of Saint Paul. The greatest concentration of individual sewage treatment systems is in the South Highwood area. Much of this area is not currently served by public sanitary sewer facilities.

The City of Saint Paul permits the building and usage of individual sewage treatment systems in areas of the city that are not served by public sewer or are unable to connect to an existing sewer system. The City's management program for on-site sewage treatment includes provisions for the regulation and monitoring of all individual sewage treatment systems. The maintenance, design, construction and location of septic systems are required to conform with Minnesota Pollution Control Agency Minnesota Rules 7080, Minnesota State Building Code, Minnesota Plumbing Code and Minnesota Water Well Construction Code.

On-Site System Management

The City of Saint Paul ordinances regulate the installation of new on-site systems as well as the maintenance and reviews of existing systems. A permit issued by a City License, Inspections and Environmental Protection official must be attained prior to any new installation, alteration, repair or extension of any sewage treatment system. The Saint Paul management and control program implements the current Minnesota Pollution Control Agency (MPCA) standards and includes:

- inspection of new systems
- inspection and maintenance of existing systems
- correction of nonconforming systems
- testing of water supply wells.

Inspection of New Systems

New individual sewage treatment systems require a construction permit issued by the City's building official. The building official is responsible for administration and enforcement of the design, construction and installation provisions of the City ordinances relating to septic systems. New treatment systems are permitted only where sewer service is not available to the property owner. The permit application must include the identification and location of various physical features and characteristics, ground slope, details of the proposed installation, soil and percolation test data, location of an alternate site and a site evaluation as well as evidence of compliance with all state and other

jurisdiction regulations, including Minnesota Rules 7080. Permit applications are evaluated by LIEP officials to determine compliance with all the above stated regulations. No alternative or experimental systems are allowed.

Inspection and Maintenance of Existing systems

Existing systems must be inspected and maintenance reviews conducted at least once every 2 years by a MPCA certified inspector or pumper. Each septic tank must be maintained in proper operating conditions at all times. Septic tanks are required to be pumped as inspection indicates or at least once every 2 years. Septic tank pumping must be performed by a MPCA licensed pumper and must be reported to City officials. City officials manage the maintenance of all septic systems; monitoring and filing the inspection reports, and see that the necessary pumping is performed.

Correction of Nonconforming Systems

Those systems not in compliance with the provisions indicated in the City ordinance must be modified and brought into compliance within 10 months with the exception of those built between May 27, 1989 and January 23, 1996 which are allowed 5 years. If the system is an imminent threat to public health or safety, corrections must be made within 90 days. Seepage pits, drywells, cesspools or leaching pits are considered to be failing systems and must be upgraded, replaced, or the use of these systems discontinued within 10 months of notice of noncompliance.

Testing of Water Supply Wells

Water supply wells located on properties with individual sewage treatment systems must be tested for coliform bacteria and nitrate every 2 years. The property owners are notified every 2 years requesting that these tests be performed and the results submitted to the LIEP Office.

Record keeping

The Office of License, Inspections, and Environmental Protection maintains the records pertaining to individual treatment systems. The records maintained include the following:

- A list of all active septic systems.
- Permit applications for new systems.
- Inspection and maintenance reports, performed and recorded by a licensed inspector and submitted by the property owner. This report includes a location map of the septic system, well and building structure.
- Test reports of private water supply wells.
- Pumping reports periodically submitted by a licensed pumper or the property owner.

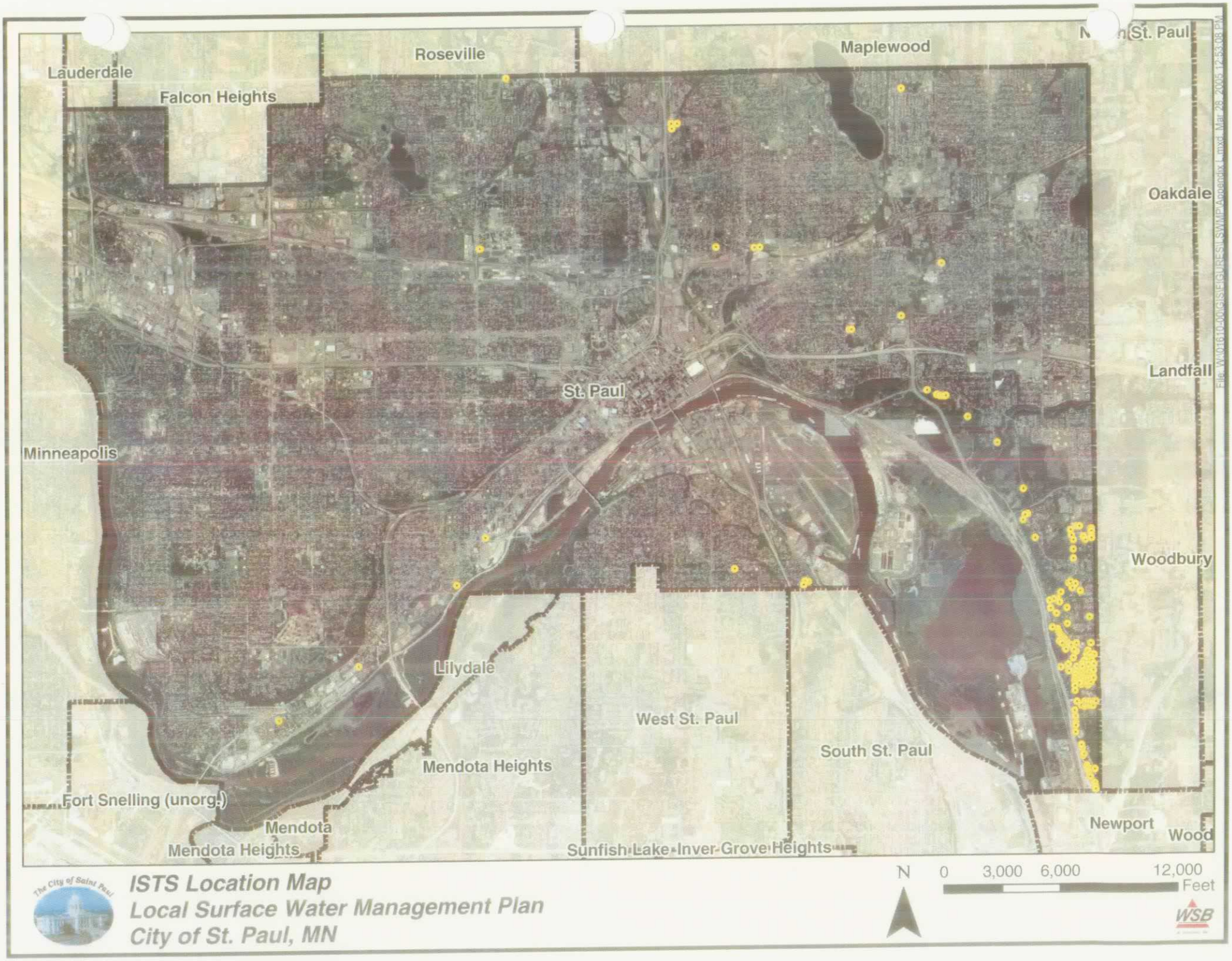
The property owners with septic systems are notified by letter every 2 years requesting submittal of maintenance reviews. Maintenance reviews must be completed by individuals licensed by the MPCA. The results of this review can be used to determine whether the property owner is issued a correction notice. Records of these reviews have been maintained by the Office of Licenses, Inspection, and Environmental Protection over the last five years. Property owners failing to submit these reviews are issued citations and are subject to fines.

Enforcement

The Office of License, Inspections, and Environmental Protection enforces the provisions outlined above of the recently amended Saint Paul Legislative Code, Chapter 50, regulating the installation and maintenance reviews of individual treatment systems. A copy of this ordinance is included on page #. The building official has the authority to inspect and review all individual treatment systems. This official may

- issue orders to revoke or suspend permits where work is not performed in compliance with the provisions of this chapter,
- require property owners to stop use of a system that is operating in a manner creating a hazard to the public health, safety or welfare,
- condemn a dwelling that is a hazard to the public or the dwelling occupants, and
- require correction of any defective system.

The City will consider variances to this code if there is undue hardship on the property owner, as long as there is no threat to public health, safety or welfare.



ISTS Location Map
Local Surface Water Management Plan
City of St. Paul, MN

Chapter 50. Individual Sewage Treatment Systems

- Sec. 50.01. General provisions.
- Sec. 50.02. Definitions.
- Sec. 50.03. Compliance with Minnesota Rules 1990, Chapter 7080.
- Sec. 50.04. Office of LIEP; environmental health responsibility.
- Sec. 50.05. Office of LIEP; building official's responsibility.
- Sec. 50.06. Permit requirements.
- Sec. 50.07. Location of new or replacement systems.
- Sec. 50.08. Construction and materials; new or replacement systems.
- Sec. 50.09. Final treatment and disposal.
- Sec. 50.10. Operation and maintenance.
- Sec. 50.11. Inspection requirements for existing, new and replacement systems.
- Sec. 50.12. Imminent threat to public health and safety.
- Sec. 50.13. Failing system.
- Sec. 50.14. Alternative systems prohibited.
- Sec. 50.15. Well water testing on lots with individual sewage treatment systems.
- Sec. 50.16. Variances.
- Sec. 50.17. Severability clause.

Sec. 50.01. General provisions.

(a) *Short title.* This chapter shall be known and referred to as the "individual sewage treatment systems ordinance."

(b) *Intent and purpose.* This chapter is adopted by the city for the following purposes:

(1) To protect the health, safety and welfare of the present and future residents of the community;

(2) To regulate the design, location, installation, use and maintenance of individual sewage treatment systems;

(3) To prevent the discharge of inadequately treated sewage to ground or surface waters;

(4) To protect land, water and other natural resources within and outside the city from impairment, pollution or destruction;

(5) To prevent and avoid health and ecological hazards attributable to bacterial and chemical contamination of lands and waters;

(6) To protect water supply wells from contamination by inadequate or improperly designed, located, installed or maintained individual sewage treatment systems;

These standards are not intended to cover systems treating industrial waste or other wastewater that may contain hazardous materials.

(Ord. No. 17888, § 1, 11-21-91; C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.02. Definitions.

As used in this chapter, the terms defined in Minnesota Rules 1990, Chapter 7080.0020 are incorporated herein by reference and shall be applicable to the provisions contained herein. The following additional definitions shall apply to this chapter:

Building official: The head of the building inspection and design office of the Saint Paul Office of License, Inspections and Environmental Protection.

Environmental health official. The person designated as the environmental health officer of the city or the environmental health officer's designee.

Licensed inspector: A person licensed by the MPCA as an inspector or designer I for evaluating site evaluations and designs; conducting compliance inspections and permitting inspection activities; issuing written certificates of compliance and notices of noncompliance; and issuing and maintaining inspection reports.

Licensed pumper: A person licensed by the MPCA for measuring scum and sludge depths for the accumulation of solids and removing these deposits; maintaining portable toilets; storing and hauling septage; disposing of septage; identifying problems related to sewage tanks, dosing chambers, baffles, maintenance hole covers and extensions, and pumps, and making repairs; inspecting and evaluating water tightness of sewage tanks, dosing chambers, distribution devices, valve

boxes, or drop boxes; and cleaning supply pipes and distribution pipes.

LIEP. The City of Saint Paul Office of License, Inspections and Environmental Protection.

Minnesota Rules 1990, Chapter 7080. The state chapter containing minimum standards and criteria for the design, location, installation, use and maintenance of individual sewage treatment systems, as administered by the Minnesota Pollution Control Agency, Water Quality Office.

MPCA. The Minnesota Pollution Control Agency.

Undisturbed soil. Undisturbed soil means soil in its original, natural state. It does not mean soil which has been placed as fill in order to achieve soil separation.

(C.F. No. 95-1089, § 1, 10-4-95; C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.03. Compliance with Minnesota Rules 1990, Chapter 7080.

Existing individual sewage treatment systems and new individual sewage treatment systems installed after the effective date of this chapter shall comply with the requirements of Minnesota Rules 1990, Chapter 7080, and Minn. Stat. § 115.55 unless, with respect to new or replacement systems, modified in this chapter.

(Ord. No. 17888, § 1, 11-21-91; C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.04. Office of LIEP; environmental health responsibility.

(a) The office of LIEP shall be responsible for the administration and enforcement of the maintenance provisions of this chapter, including, but not limited to, notifying the owners of individual sewage treatment systems of inspection dates, monitoring the results of maintenance reviews, ensuring that pumping is performed as necessary, keeping on file inspection reports for each individual sewage treatment system, investigating complaints and ordering corrective action necessary to protect the public health, safety and welfare of the community.

(b) The office of LIEP shall have the power to:

(1) Require property owners to cease and desist from the use of an individual sewage treatment system operating in a manner creating a hazard to the public health, safety or welfare; and

(2) Condemn a dwelling as unfit for human habitation where the improper functioning or failure of an individual sewage treatment system constitutes a hazard to the public health, safety or welfare of the occupants of the dwelling. Such action shall be in compliance with the provisions of Chapter 34.

(c) The building official or environmental health official shall have the authority to inspect all individual sewage treatment systems. The owner or occupier of property with an individual sewage treatment system shall provide access at reasonable times for the purpose of performing any inspection or review required under this chapter whenever there is probable cause to believe that a hazard to the public health, safety or welfare exists or when inspections and reviews are required or necessary to insure compliance with the provisions of this chapter.

(Ord. No. 17888, § 1, 11-21-91; C.F. No. 95-1089, § 2, 10-4-95; C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.05. Office of LIEP; building official's responsibility.

The building official shall be responsible for administration and enforcement of the design, construction and installation provisions for this chapter for new systems and the replacement and repair of existing systems, including, but not limited to, reviewing and evaluating technical matters relating to system design and installation. The building official or his/her agent shall be qualified and licensed by the MPCA as competent in the inspection of individual sewage treatment systems. The building official shall have the power to issue orders to:

(1) Suspend or revoke permits or stop action upon information indicating that the permit was issued in error or on the basis of incorrect or inadequate information, or that work is not being performed in compliance with the requirements of this chapter.

(2) Require the correction of new or existing systems where, following inspection and review, a system is determined to be defective.

(Ord. No. 17888, § 1, 11-21-91; C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.06. Permit requirements.

(a) *Permit required.* No person shall install, alter, repair or extend any individual sewage treatment system in the city without first obtaining a permit from the building official for the specific work and complying with the provisions of Chapter 33 of this Code. Permits shall not be required for inspections involving the review and maintenance of systems. A building permit or variance may not be issued for the addition of a bedroom on a property served by a system unless the system is in compliance with the applicable requirements, as evidenced by a certificate of compliance issued by a licensed inspector, site evaluator or designer. However, the requirements may be waived between November first and April thirtieth of each year provided that an inspection of the system is performed no later than the following June first and the applicant submits a certificate of compliance no later than the following September thirtieth.

(b) *Application contents.* Permit application shall be made in writing upon forms provided by the building official and shall contain data including, but not limited to that required under Minnesota Rules, Chapter 7080, and the following:

(1) Correct legal description of the property on which the proposed work is to take place.

(2) Site plan, drawn to scale, showing the location of all proposed and existing structures in relation to the boundary lines of the property; present or proposed location of water supply facilities and water supply piping; the name of the individual or firm who will install the sewage treatment system; terrain features such as bluff lines, waterways and water bodies; buried utilities; easements and other unique features of the site.

A scale drawing showing the following shall be kept on file at the office of LIEP:

a. Lot dimensions;

b. House location;

c. Location and plan of the proposed individual sewage treatment system;

d. Relative elevations, in Saint Paul datum, of the house, lot corners and soil treatment area;

e. Location and elevations of percolation test holes and soil borings;

f. Slope of ground at site of soil treatment area; and

g. Distance to all surface waters, wells, proposed wells, springs or other surface water within one hundred fifty (150) feet of the proposed soil treatment area.

h. Soil test data, including soil boring logs, percolation test data with field notes, and location and identification of the test area.

i. Plans and details of the proposed installation or work, including engineering data when required and supporting data attesting to compliance with the minimum standards of this chapter.

j. Building plans showing existing and proposed room arrangement and uses.

k. For other establishments, calculated or measured water use rates, occupancy and occupant load.

l. Evidence of compliance with state or other jurisdiction regulations where applicable.

(3) The following supporting data, which shall be kept on file at the office of LIEP:

a. Log of all soil exploration work, including a description of the various strata encountered;

b. Groundwater conditions, including indications of seasonal groundwater fluctuations, such as mottling, and the presence of gray soil coloration as indicated by a soil color with a chroma of two (2) or less (Munsell Color);

c. Design data for the system;

d. Soil test data derived from soil borings and percolation tests for each proposed site or installation shall be in accordance with Minnesota Rules 7080.0110. At a minimum, four (4) satisfactory soil borings per site shall be made. Borings shall be made by auger or excavation and shall be staked and protected until notification that field evaluation has been completed. If one (1) or more borings encounters unsuitable or limiting conditions, additional borings shall be made in order to outline an adequate area of suitable soil conditions;

e. Results of at least two (2) soil percolation tests per site performed according to Minnesota Rules 7080.0110, subpart 4 and including:

1. Within the outlined area, a minimum of two (2) percolation tests, evenly spaced, shall be made. Where soil conditions vary within the tested area, one (1) additional percolation test shall be made in each soil type. Fill soils may require more than one (1) additional percolation test;

2. Percolation rates shall be determined for each test hole and recorded on worksheets showing all measurements and calculations.

f. Written verification from the installer that the system was installed as designed and indicated on the "as built" drawings and in compliance with all the requirements of Minn. Rules Chapter 7080, and this chapter, as from time to time amended.

g. Prior to final acceptance, a certificate of compliance and an "as built" drawing of the system must be submitted to the office of LIEP.

(4) No building permit shall be issued for the construction, alteration, expansion or remodeling of any dwelling or other establishment served by an individual sewage treatment system until the permit required for the treatment system has been issued. Occupancy shall be prohibited until a final inspection of the system has been conducted.

(c) *Site evaluation.* An evaluation of the site's suitability for an individual sewage treatment system according to the evaluation factors provided in Minnesota Rules 7080.0110, shall be made by an individual or firm licensed by the MPCA as a site evaluator.

(Ord. No. 17888, § 1, 11-21-91; C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.07. Location of new or replacement systems.

(a) Individual sewage treatment systems and each component thereof shall be located and installed to ensure, with proper maintenance, that the system will function in a sanitary manner, will not create a nuisance and will not contaminate any domestic water supply well. System location shall consider lot size and configuration, proposed structures and other improvements, topography, surface drainage, soil conditions, depth to groundwater, geology, existing and proposed water supply wells, accessibility for maintenance, expansion or replacement of the system, and setbacks as required in Table IV of this chapter. Installation of systems in low swampy areas or drainage swales is prohibited. Systems shall not be located within utility or drainage easements or within dedicated public or private right-of-way.

(b) *Lot size.* In addition to the area needed for all existing and expected improvements, the lot shall have an adequate area of soil suitable for the installation of two (2) individual sewage treatment systems, in the event that the primary system fails and a replacement system must be installed. The second drainfield site shall be preserved for this purpose.

(c) *Location of septic tanks.* Septic tanks shall be located as required in Minnesota Rules 7080.0130, subpart 4.

(d) *System location.* System location shall be as required in Minnesota Rules 7080.0170, subpart 2.B. and in accordance with the following table:

Table IV

Minimum Setback Distances (feet)

Feature	Sewage tank	Soil treatment area
Water supply well less than fifty (50) feet deep and not encountering at least ten (10) feet of impervious material	100	100
Any other water supply well or buried water suction pipe	75	75
Buried pipe distributing water under pressure	10	10
Buildings	10	20
Property lines	10	10
Established River Corridor bluff lines. See, Saint Paul Legislative Code Chapter 65 et seq.	40	40
The ordinary high water mark of: Recreation development lakes and streams	75	75
Urban and tributary river segments	50	50
Wetlands (1 acre or larger)	50	50

(Ord. No. 17888, § 1, 11-21-91; C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.08. Construction and materials; new or replacement systems.

(a) *Generally.* The design, construction and location of and the materials permitted for use in building sewers shall be regulated by the Minnesota State Building Code, which incorporates by reference portions of the Minnesota Plumbing Code, and by specific provisions of the Minnesota Water Well Construction Code.

(b) *Sewage tanks.* All sewage tanks, including septic and aerobic, shall be designed, constructed and shall conform with Minnesota Rules 7080.0130.

(c) *Capacity of septic tanks:*

(1) The liquid capacity of a septic tank serving a dwelling shall be based on the number of bedrooms provided or contemplated in the dwelling served and shall be at least as large as the capacities given below:

Number of Bedrooms	Tank Liquid Capacities (Gallons)
2 or less	1,000
3 or 4	1,200
5 or 6	1,500
7--9	2,000

For ten (10) or more bedrooms, the septic tank shall be sized as in other establishments. For multiple-family dwellings containing two (2) or more dwelling units, the size shall be the sum of the individual dwelling unit requirements.

(2) If a garbage disposal unit is installed in a residence or other establishment, the septic tank capacity must be at least fifty (50) percent greater than that required in item (1) above and either multiple compartments or multiple tanks must be provided.

(Ord. No. 17888, § 1, 11-21-91; C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.09. Final treatment and disposal.

(a) *Treatment required.* The system or systems shall be designed, installed and maintained to receive all sewage from the dwelling, building or other establishment served. Footing or roof drainage shall not enter any part of the system. Products containing hazardous materials must not be discharged to the system, other than a normal amount of household products and cleaners designed for household use. Substances not used for household cleaning, including solvents, pesticides, flammables, photo-finishing chemicals or dry cleaning chemicals, must not be discharged to the system. Final treatment and disposal of all sewage tank effluent shall be by means of a standard soil treatment and disposal system.

(b) *System sizing.* System sizing shall be as provided in Minnesota Rules Chapter 7080.

(c) *System design and construction for new and replacement systems.* System design and construction shall be as required in Minnesota Rules Chapter 7080 and as follows:

(1) In soils having percolation rates of fifteen (15) minutes per inch or faster, the bottom of the filter material shall be at least four (4) feet above the water table or bedrock.

(2) In soils having percolation rates of sixteen (16) minutes per inch through sixty (60) minutes per inch, the bottom of the filter material shall be at least three (3) feet above the water table or bedrock.

(3) Excavation equipment or other vehicles shall not be driven on the soil treatment area.

(Ord. No. 17888, § 1, 11-21-91; C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.10. Operation and maintenance.

(a) *General requirements:*

(1) Each individual sewage treatment system existing as of the date of adoption of this chapter, as well as those installed under this chapter, shall be operated and maintained according to the provisions of this section.

(2) Responsibility for the proper operation and maintenance of individual sewage treatment systems shall be as follows:

a. The owner of each dwelling unit or other establishment served by an individual sewage treatment system shall be responsible for the adequate and proper functioning and maintenance of the system. It shall be the owner's responsibility to show that the individual sewage treatment system is in conformance with all requirements of this chapter, and that the system properly treats and disposes of all sewage input from an occupied building.

b. The office of LIEP shall investigate complaints and order corrective action to protect the health, safety and welfare of the community in the event that the responsible owner is negligent or fails to take action as required by this chapter.

(3) It shall be unlawful for an owner or occupant to allow inadequately treated sewage to seep or flow to the surface of the ground or into surface or groundwaters or to allow an overflow. Any system so performing shall be pumped immediately by a licensed pumper and as often thereafter as necessary until satisfactory repairs have been made. Any costs related to pumping and subsequent repairs shall be borne by the property owner.

(4) It shall be the responsibility of the owner to maintain accurate records of maintenance, inspection and pumping and to report such data as required under this chapter to the office of LIEP on forms provided by the city.

(5) Failure on the part of the owner to inspect, pump and/or maintain the owner's individual sewage treatment system as required by this chapter shall constitute a nuisance which may be abated by the city pursuant to the provisions of Chapter 45.

(b) *Maintenance of all septic tanks.* Septic tanks shall be maintained as required in Minnesota Rules Chapter 7080 and as follows:

(1) Each septic tank and existing septic tank shall be maintained in proper operating condition at all times.

(2) A maintenance review of each septic tank shall be conducted once every two (2) years as required in section 50.11(4) of this chapter. Verification of the maintenance review and a full reporting of the results shall be submitted to the office of LIEP upon forms provided by the office of LIEP.

(3) In any instance where it is determined that maintenance practices or procedures are inadequate or improper, the office of LIEP shall require the owner to comply with the provisions of this chapter.

(c) *Pumping:*

(1) Whenever inspection of the septic tank discloses that the accumulated sludge in the bottom of the tank has reached a point twelve (12) inches or less from the bottom of the outlet baffle device, or that the bottom of the floating scum layer is less than three (3) inches above the bottom of the outlet baffle device, the owner shall have the tank promptly pumped to remove all accumulated septage. Pumping shall be performed by a licensed pumper.

(2) No septic tank shall remain in service without being pumped at least once every two (2) years, whether or not the measurement indicates a sludge buildup. Each existing septic tank shall be pumped at least once within twenty-four (24) months of the effective date of this chapter and thereafter at least once within twenty-four (24) months of each subsequent pumping.

(3) Whenever inspection of pump stations, distribution devices or drop boxes indicates the accumulation of solids, such devices shall be promptly cleaned.

(4) Every septic tank pumping shall be reported by the owner to the office of LIEP on forms provided for that purpose within thirty (30) calendar days of the pumping. The report shall include the owner's name and address, the date of the pumping, the contractor who performed the pumping, the number of gallons removed and the location of sewage disposal.

(5) Pumping for the removal of septage shall be performed only by persons or firms licensed by the MPCA as pumpers.

(6) Disposal of septage shall be only at approved disposal sites or facilities. Dumping or spreading of septage on the surface of the ground is prohibited. Disposal of septage within the city shall be by means approved by the office of public works.

(7) The office of LIEP shall maintain appropriate records of septage pumping and disposal activities and shall require such reporting by owners as is reasonable and necessary to ensure that adequate maintenance and disposal is being accomplished.

(Ord. No. 17888, § 1, 11-21-91; C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.11. Inspection requirements for existing, new and replacement systems.

(1) *Existing systems; compliance inspection criteria:* An inspection of an existing system must evaluate for the following criteria:

(a) Imminent threat to public health or safety as indicated in section 50.12.

(b) An existing system that is not an imminent threat to public health or safety need not be upgraded, repaired or replaced, or its use discontinued which has at least two (2) feet of undisturbed soil separation between the bottom of the distribution medium and the top layer of either the consolidated and unweathered parent material or the seasonally saturated layer.

(c) Paragraph (b) does not apply to systems in shore land areas regulated under Minn. Stat. §§ 103F.201 to 103F.221, wellhead areas as defined in Minn. Stat. § 103I.005, or those used in connection with food, beverage, and lodging establishments regulated under Minn. Stat. Chapter 157.

(d) If the system is failing as indicated in section 50.13, the system must be upgraded, replaced or its use discontinued within ten (10) months of a notice of noncompliance.

(e) If the system fails to provide sufficient groundwater protection, the system must be repaired, replaced, or its use discontinued within ten (10) months of a notice of noncompliance.

(2) *Existing systems; certificate of compliance:* All existing individual sewage treatment systems shall be inspected by a

licensed inspector. The certificate of compliance shall be given to the owner and a copy submitted to the office of LIEP within thirty (30) days of the compliance inspection. The certificate of compliance must include but is not limited to the following:

(a) Date of the inspection.

(b) Address of the system location.

(c) Name and address of the property owner.

(d) Name, address and MPCA license number of the licensed inspector who conducted the inspection and issued the certificate.

(e) A certified statement from the licensed inspector or qualified employee who conducted the compliance inspection indicating that the individual sewage treatment system is in compliance with MN Rules 7080 and this chapter.

(f) The licensed inspector shall prepare a scale diagram of the sewage treatment system, or verify that such a diagram is on file with the office of LIEP, which shows the location of the system and its components, the location of other water supply wells, if present, the size and depth of the system, the depth to the seasonally high water table or bedrock, the size and integrity of the tank, and baffles on the tank. One (1) copy of the diagram shall thereafter be kept on the premises and a second copy shall be kept on file at the office of LIEP. The diagrams shall be updated when alterations or extensions are made to the system or private well.

(g) A copy of the inspection report, on forms to be provided by the office of LIEP, and proof that the system meets the requirements of this chapter as evidenced by a certificate of compliance shall be submitted to the environmental health officer within thirty (30) days of the inspection. In addition to the inspection report, the property owner shall submit to the office of LIEP such fee as may be set by the city council.

(h) Upon receipt of a complete inspection report, certificate of compliance and fee, the environmental health officer shall notify the property owner that the owner has complied with the inspection requirements of this chapter for existing systems.

(i) The owner of an existing system that has had their system inspected by a licensed inspector and has submitted the appropriate reports and fees to the office of LIEP before August 1, 1997, are not required to have a compliance inspection and certificate of compliance except if the system is replaced, upgraded or repaired, or the issuance of a permit for the addition of a bedroom.

(3) *Existing systems; notice of noncompliance:* When conducting a compliance inspection, the licensed inspector must immediately provide notice of noncompliance to the property owner upon discovery of noncompliance with the provisions of this chapter. The inspector shall also immediately provide the office of LIEP with a copy of the noncompliance notice. The noncompliance notice must specify why the system must be upgraded, replaced, or its use discontinued. The system shall be upgraded, replaced, or discontinued within ten (10) months of receipt of orders from the building official. However, for any system installed between May 27, 1989, and January 23, 1996, which does not comply with these requirements, the property owner has five (5) years from the date of the building permit to bring the system into compliance.

(4) *Existing systems; maintenance reviews:* Maintenance reviews shall be conducted by a licensed inspector or a licensed pumper according to the following standards in order to monitor the condition of the system, assure its proper performance and protect surface and groundwater quality:

(a) A maintenance review shall be performed at least every two (2) years. The review shall include, but shall not be limited to:

1. Measurement of accumulated sludge and scum in the septic tank.

2. Review of effluent levels in soil treatment systems provided with inspection wells.

3. Review of pumps and pump stations when included as part of the system.

4. Review of distribution devices and drop boxes.

5. A list and description of any repairs or alterations made to the system since the last maintenance review.

6. Any condition of the system that constitutes an imminent threat to public health and safety as defined in section 50.12 of this chapter.

7. Any condition of the system which constitutes a failing system as defined in section 50.13.

(b) A copy of the review report, on forms to be provided by the office of LIEP, and proof that either the system meets the requirements of this chapter or that any repairs have been made, shall be submitted to the environmental health officer at the office of LIEP within thirty (30) days of the date of the review. Further, the property owner shall submit to the office of LIEP such fee as may be set by the city council. Upon receipt of a completed report and accompanying fee, the office of LIEP shall send notification to the property owner indicating that the owner of the system has complied with the maintenance review requirements of this chapter.

(5) *[Reserved.]*

(6) *New construction and replacement systems; compliance inspection criteria:*

(a) Compliance inspections shall be performed by the building official, or by a licensed inspector, at each system installation, prior to any work having been covered by backfill.

(b) The owner or licensed inspector shall notify the building official at least twenty-four (24) hours prior to the time work is ready for inspection or reinspection.

(c) Work that is backfilled prior to required inspection may be ordered to be uncovered whenever necessary to determine compliance.

(d) Noted deficiencies shall be properly corrected and reinspected before work on the project is continued.

(e) No individual sewage treatment system shall be placed or replaced in service until final inspection and approval of the installation.

(f) Fees for inspections or reinspections shall be as set by council resolution.

(7) *New construction and replacement systems; certificate of compliance:* Final approval of newly constructed or replacement systems shall be evidenced by a certificate of compliance. The certificate of compliance shall be issued by a licensed inspector to the owner and a copy submitted to the office of LIEP. The certificate of compliance must include but is not limited to the following:

(a) Date of the inspection.

(b) Address of the system location.

(c) Name and address of the property owner.

(d) Name, address and MPCA license number of the licensed inspector who conducted the inspection and issued the certificate.

(e) A certified statement from the licensed inspector who conducted the compliance inspection indicating that the individual sewage treatment system is in compliance with MN Rules 7080 and this chapter.

(f) Name, address and MPCA license number of the licensee or qualified individual who installed the system.

(8) *New construction and replacement systems; notice of noncompliance:* A licensed inspector must immediately provide written notice of noncompliance to the system owner upon discovery of noncompliance. The licensed inspector shall also immediately provide the office of LIEP with a copy of the noncompliance notice. The notice of noncompliance must specify why the system is not in compliance. The office of LIEP shall issue proper orders to bring the system into compliance. The system shall be brought into compliance before a certificate may be issued approving use of the system. The office of LIEP shall review all notices of noncompliance and inspection reports received and shall notify the owner of the property if the system is in compliance or does not meet the compliance criteria set forth in Minnesota Rules Chapter 7080 or this chapter.

(Ord. No. 17888, § 1, 11-21-91; C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.12. Imminent threat to public health and safety.

(1) If at any time one (1) or more of the following conditions exists the system constitutes an imminent threat to public health or safety and, if not repaired, must be upgraded, replaced, or its use discontinued within ninety (90) days of a notice of noncompliance:

a. Sewage discharge to surface water.

b. Sewage discharge to ground surface.

c. Sewage backup.

d. Any other situation with the potential to immediately and adversely affect or threaten public health or safety.

(Ord. No. 17888, § 1, 11-21-91; C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.13. Failing system.

If a seepage pit, drywell, cesspool or leaching pit exists, the system is failing and must be upgraded, replaced or its use discontinued within ten (10) months of a notice of noncompliance.

(Ord. No. 17888, § 1, 11-21-91; C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.14. Alternative systems prohibited.

No alternative or experimental systems are allowed. In no case are privies, seepage pits, or cesspools allowed. Holding tanks shall be allowed only when necessary to replace an existing system; they shall not be allowed as original system for a new dwelling unit.

(Ord. No. 17888, § 1, 11-21-91; C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.15. Well water testing on lots with individual sewage treatment systems.

(a) *Testing of water from existing wells:*

(1) Coliform bacteria and chemical (nitrate) testing of well water shall be conducted for those parcels containing both an individual sewage treatment system and a private water well on the effective date of this chapter. It shall be the responsibility of the property owner to either:

a. Submit well water samples, using kits from the office of public health, to the office of LIEP or testing and analysis; or

b. Contract with a laboratory certified by the Minnesota Office of Health for collection, testing and analysis. Testing and analysis shall occur within twelve (12) months of the effective date of this chapter. Test results shall be submitted by the property owner to the office of LIEP on forms to be provided by the office of LIEP, along with such fee as may be set by the city council. The office of LIEP shall then issue a certificate, to be good for two (2) years, to the property owner verifying that the water samples are within the standards set for public health.

(2) After the initial coliform bacteria and nitrate testing of water from all existing private wells, coliform bacteria and nitrate testing shall be conducted every two (2) years thereafter as described in subsection (a)(1) above. Within thirty (30) days of the testing, a copy of the test results, on forms to be provided by the office of LIEP, shall be submitted by the property owner to the office of LIEP, along with such fee as prescribed by the city council. The office of LIEP shall then issue a certificate, to be good for two (2) years, to the property owner verifying that the water samples are within the standards set for public health.

(b) *Testing of water from wells installed after the effective date of this chapter.* Coliform bacteria and nitrate testing of water from all private wells installed after the effective date of this chapter shall be conducted every two (2) years from the date of installation as described in subsection (a)(1) above. Within thirty (30) days of the testing, a copy of the test results, on forms to be provided by the office of LIEP, shall be submitted by the property owner to the office of LIEP, along with such fee as prescribed by the city council. The office of LIEP shall issue a certificate, to be good for two (2) years, to the property owner verifying that the water samples are within the standards set for public health.

(c) *Responsibility for testing for EPA's primary pollutants.* Random sample testing of water from private wells for the United States Environmental Protection Agency's primary pollutants shall be conducted by the office of public health.

(C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.16. Variances.

The legislative hearing officer, in accordance with the provisions of Chapter 18, may, with the approval of the city council, modify or revoke any order and may grant an extension of time where the legislative hearing officer finds that there is undue hardship based upon cost connected with compliance with chapter, or any applicable rules or regulations. In no event shall a variance be granted if to do so would cause a threat to the public health, safety or welfare. Also, no action by the legislative hearing officer shall exempt an owner from meeting the inspection and reporting requirements set forth herein.

(C.F. No. 98-601, § 1, 8-5-98)

Sec. 50.17. Severability clause.

If any of the provisions of this chapter are determined by a court of competent jurisdiction to be unlawful or unconstitutional, such determination shall extend only to the provision or provisions involved, which shall be severed from this chapter, and the remaining provisions shall be given full force and effect and construed as a whole thereafter.

(C.F. No. 98-601, § 1, 8-5-98)

Appendix M

Water Quality Modeling

2003 Pollutant Loading Calculations

Pollutant loadings in pounds were calculated for each watershed using the following formula:

L = [P (Pj) (Rv) / 12] (C) (A)(2.72)

P = rainfall depth in inches over the desired time period

Pj = correction factor for storms that produce no runoff

Rv = runoff coefficient, which is the fraction of rainfall which is converted to runoff

C = event mean concentration of the pollutant (mg/l)

A = area of the development site in acres

Values used in loading calculations:

P = 22.73 inches annual rainfall

Pj = 0.85

Rv and A - See Watershed Inventory

C = See following table

Parameter	Units	C
TP	mg/l	0.474
TDP	mg/l	0.114
TKN	mg/l	2.100
NO3ON2	mg/l	0.496
NH3	mg/l	0.346
CL	mg/l	587.000
BOD	mg/l	16.000
TSS	mg/l	116.000
TDS	mg/l	725.000
Cd	ug/l	2.110
Cu	ug/l	23.400
Pb	ug/l	22.000
Zn	ug/l	107.000

2003 Annual Pollutant Loadings (pounds)

Pollutant	Beaver Lake 1	Belt Line 2	Lake Phalen 3	Trout Brook 4	Lake Como 5	St. Anthony Park 6	Phalen Creek 7	St. Anthony Hill 8	Griffith/ Pt. Douglas 9	West Kittsondale 10	Urban 11	Battle Creek 12
TP	190	3,290	867	5,095	1,210	3,482	1,810	3,377	580	1,178	401	1,221
TDP	46	791	209	1,225	291	838	435	812	139	283	96	294
TKN	844	14,577	3,843	22,574	5,360	15,428	8,017	14,962	2,569	5,219	1,777	5,408
NO3ON2	199	3,443	908	5,332	1,266	3,644	1,893	3,534	607	1,233	420	1,277
NH3	139	2,402	633	3,719	883	2,542	1,321	2,465	423	860	293	891
CL	235,832	4,074,748	1,074,278	6,309,883	1,498,300	4,312,431	2,240,893	4,182,150	718,190	1,458,822	496,728	1,511,701
BOD	6,428	111,066	29,282	171,990	40,840	117,545	61,081	113,994	19,576	39,763	13,539	41,205
TSS	46,604	805,231	212,293	1,246,927	296,086	852,201	442,834	826,456	141,925	288,285	98,161	298,735
TDS	291,275	5,032,696	1,326,833	7,793,297	1,850,540	5,326,257	2,767,713	5,165,348	887,032	1,801,782	613,506	1,867,092
Cd	0.8	14.6	3.9	22.7	5.4	15.5	8.1	15.0	2.6	5.2	1.8	1.8
Cu	9	162	43	252	60	172	89	167	29	58	20	20
Pb	9	153	40	236	56	162	84	157	27	55	19	19
Zn	43	743	196	1,150	273	786	408	762	131	266	91	91

Pollutant	Downtown 13	East Kittsondale 14	Mississippi River Blvd. 15	Goodrich/ Western 16	Pigs Eye 17	Riverview 18	Highwood 19	West Seventh 20	Crosby 21	Davern 22	Hidden Falls 23	Mississippi River Total
TP	1,042	2,407	2,857	554	2,487	3,145	1,182	560	1,351	1,458	271	35,176
TDP	250	579	687	133	598	756	284	135	325	351	65	8,460
TKN	4,614	10,662	12,658	2,457	11,017	13,933	5,237	2,483	5,984	6,459	1,199	155,843
NO3ON2	1,090	2,518	2,990	580	2,602	3,291	1,237	586	1,413	1,526	283	36,809
NH3	760	1,757	2,085	405	1,815	2,296	863	409	986	1,064	198	25,677
CL	1,289,827	2,980,420	3,538,098	686,674	3,079,647	3,894,699	1,463,989	694,077	1,672,726	1,805,501	335,085	43,561,864
BOD	35,157	81,238	96,439	18,717	83,943	106,159	39,904	18,919	45,594	49,213	9,133	1,187,376
TSS	254,889	588,976	699,181	135,697	608,584	769,651	289,306	137,160	330,556	356,794	66,218	8,608,477
TDS	1,593,057	3,681,098	4,369,882	848,107	3,803,653	4,810,319	1,808,164	857,251	2,065,974	2,229,963	413,862	53,802,983
Cd	4.6	10.7	12.7	2.5	11.1	14.0	5.3	2.5	6.0	6.5	1.2	157
Cu	51	119	141	27	123	155	58	28	67	72	13	1,737
Pb	48	112	133	26	115	146	55	26	63	68	13	1,633
Zn	235	543	645	125	561	710	267	127	305	329	61	7,941

Appendix

2003 Seasonal Pollutant Loadings (pounds)

Snowmelt (March)

Pollutant	Beaver Lake 1	Belt Line 2	Lake Phalen 3	Trout Brook 4	Lake Como 5	St. Anthony Park 6	Phalen Creek 7	St. Anthony Hill 8	Griffith/ Pt. Douglas 9	West Kittsondale 10	Urban 11	Battle Creek 12
TP	19	330	87	511	121	350	182	339	58	118	40	123
TDP	4	64	17	99	24	68	35	66	11	23	8	24
TKN	116	1,997	526	3,092	734	2,113	1,098	2,049	352	715	243	741
NO3ON2	20	344	91	533	126	364	189	353	61	123	42	128
NH3	6	110	29	170	40	116	60	113	19	39	13	41
CL	171,829	2,968,888	782,726	4,597,422	1,091,671	3,142,066	1,632,729	3,047,142	523,278	1,062,907	361,919	1,101,435
BOD	738	12,753	3,362	19,749	4,689	13,497	7,014	13,089	2,248	4,566	1,555	4,731
TSS	6,567	113,461	29,913	175,698	41,720	120,079	62,397	116,451	19,998	40,621	13,831	42,093
TDS	297,792	5,145,311	1,356,523	7,967,684	1,891,949	5,445,440	2,829,645	5,280,931	906,881	1,842,100	627,234	1,908,871
Cd	0.1	0.9	0.2	1.4	0.3	1.0	0.5	0.9	0.2	0.3	0.1	0.1
Cu	1	25	7	39	9	27	14	26	4	9	3	3
Pb	1	23	6	35	8	24	13	23	4	8	3	3
Zn	7	120	32	186	44	127	66	123	21	43	15	15

Pollutant	Downtown 13	East Kittsondale 14	Mississippi River Blvd. 15	Goodrich/ Western 16	Pigs Eye 17	Riverview 18	Highwood 19	West Seventh 20	Crosby 21	Davern 22	Hidden Falls 23	Mississippi River Total
TP	105	242	287	56	250	316	119	56	136	146	27	3,531
TDP	20	47	56	11	49	61	23	11	26	28	5	686
TKN	632	1,460	1,734	336	1,509	1,908	717	340	820	885	164	21,345
NO3ON2	109	252	299	58	260	329	124	59	141	152	28	3,677
NH3	35	80	95	19	83	105	40	19	45	49	9	1,175
CL	939,776	2,171,553	2,577,881	500,315	2,243,851	2,837,704	1,066,672	505,709	1,218,759	1,315,500	244,145	31,739,459
BOD	4,037	9,328	11,074	2,149	9,639	12,190	4,582	2,172	5,235	5,651	1,049	136,342
TSS	35,915	82,989	98,518	19,120	85,752	108,447	40,765	19,326	46,577	50,274	9,330	1,212,973
TDS	1,628,705	3,763,468	4,467,666	867,084	3,888,766	4,917,957	1,848,624	876,433	2,112,203	2,279,862	423,122	55,006,913
Cd	0.3	0.7	0.8	0.2	0.7	0.9	0.3	0.2	0.4	0.4	0.1	10
Cu	8	19	22	4	19	24	9	4	10	11	2	271
Pb	7	17	20	4	17	22	8	4	9	10	2	244
Zn	38	88	104	20	91	115	43	20	49	53	10	1,283

2003 Seasonal Pollutant Loadings (pounds)

Spring (April-May)

Pollutant	Beaver Lake 1	Belt Line 2	Lake Phalen 3	Trout Brook 4	Lake Como 5	St. Anthony Park 6	Phalen Creek 7	St. Anthony Hill 8	Griffith/ Pt. Douglas 9	West Kittsondale 10	Urban 11	Battle Creek 12
TP	59	1,022	270	1,583	376	1,082	562	1,049	180	366	125	379
TDP	13	230	61	355	84	243	126	236	40	82	28	85
TKN	204	3,521	928	5,452	1,295	3,726	1,936	3,614	621	1,261	429	1,306
NO3ON2	45	777	205	1,204	286	823	427	798	137	278	95	288
NH3	38	652	172	1,010	240	690	359	669	115	233	79	242
CL	377	6,520	1,719	10,097	2,398	6,901	3,586	6,692	1,149	2,334	795	2,419
BOD	1,660	28,689	7,564	44,426	10,549	30,362	15,777	29,445	5,057	10,271	3,497	10,643
TSS	12,227	211,255	55,696	327,135	77,679	223,577	116,179	216,823	37,234	75,632	25,753	78,374
TDS	6,038	104,323	27,504	161,548	38,360	110,408	57,372	107,073	18,387	37,349	12,717	38,703
Cd	0.2	2.6	0.7	4.0	1.0	2.8	1.4	2.7	0.5	0.9	0.3	0.3
Cu	4	63	17	98	23	67	35	65	11	23	8	8
Pb	2	39	10	60	14	41	21	40	7	14	5	5
Zn	12	206	54	319	76	218	113	211	36	74	25	25

Pollutant	Downtown 13	East Kittsondale 14	Mississippi River Blvd. 15	Goodrich/ Western 16	Pigs Eye 17	Riverview 18	Highwood 19	West Seventh 20	Crosby 21	Davern 22	Hidden Falls 23	Mississippi River Total
TP	324	748	888	172	773	977	367	174	420	453	84	10,930
TDP	73	168	199	39	173	219	82	39	94	102	19	2,454
TKN	1,115	2,575	3,057	593	2,661	3,365	1,265	600	1,445	1,560	290	37,641
NO3ON2	246	568	675	131	587	743	279	132	319	344	64	8,309
NH3	206	477	566	110	493	623	234	111	268	289	54	6,971
CL	2,064	4,769	5,661	1,099	4,928	6,232	2,343	1,111	2,677	2,889	536	69,705
BOD	9,081	20,984	24,911	4,835	21,683	27,421	10,307	4,887	11,777	12,712	2,359	306,704
TSS	66,871	154,519	183,432	35,600	159,664	201,920	75,900	35,984	86,722	93,606	17,372	2,258,457
TDS	33,023	76,306	90,584	17,580	78,846	99,714	37,482	17,770	42,826	46,225	8,579	1,115,287
Cd	0.8	1.9	2.3	0.4	2.0	2.5	0.9	0.4	1.1	1.2	0.2	28
Cu	20	46	55	11	48	61	23	11	26	28	5	678
Pb	12	28	34	7	29	37	14	7	16	17	3	413
Zn	65	151	179	35	156	197	74	35	85	91	17	2,203

2003 Seasonal Pollutant Loadings (pounds)

Summer (June-August)

Pollutant	Beaver Lake 1	Belt Line 2	Lake Phalen 3	Trout Brook 4	Lake Como 5	St. Anthony Park 6	Phalen Creek 7	St. Anthony Hill 8	Griffith/ Pt. Douglas 9	West Kittsondale 10	Urban 11	Battle Creek 12
TP	75	1,303	343	2,017	479	1,378	716	1,337	230	466	159	483
TDP	13	232	61	360	85	246	128	238	41	83	28	86
TKN	349	6,034	1,591	9,343	2,219	6,386	3,318	6,193	1,063	2,160	736	2,238
NO3ON2	76	1,322	348	2,047	486	1,399	727	1,356	233	473	161	490
NH3	35	599	158	927	220	633	329	614	106	214	73	222
CL	485	8,380	2,209	12,977	3,081	8,869	4,609	8,601	1,477	3,000	1,022	3,109
BOD	2,217	38,309	10,100	59,323	14,086	40,543	21,068	39,319	6,752	13,715	4,670	14,212
TSS	16,075	277,739	73,224	430,088	102,126	293,940	152,742	285,060	48,953	99,435	33,858	103,039
TDS	9,423	162,813	42,924	252,121	59,867	172,310	89,538	167,104	28,696	58,289	19,848	60,402
Cd	0.1	2.4	0.6	3.7	0.9	2.5	1.3	2.5	0.4	0.9	0.3	0.3
Cu	3	57	15	89	21	61	32	59	10	21	7	7
Pb	3	60	16	93	22	64	33	62	11	22	7	7
Zn	11	187	49	289	69	198	103	192	33	67	23	23

Pollutant	Downtown 13	East Kittsondale 14	Mississippi River Blvd. 15	Goodrich/ Western 16	Pigs Eye 17	Riverview 18	Highwood 19	West Seventh 20	Crosby 21	Davern 22	Hidden Falls 23	Mississippi River Total
TP	412	953	1,131	219	984	1,245	468	222	535	577	107	13,925
TDP	74	170	202	39	176	222	83	40	95	103	19	2,483
TKN	1,910	4,413	5,239	1,017	4,560	5,767	2,168	1,028	2,477	2,673	496	64,504
NO3ON2	418	967	1,148	223	999	1,263	475	225	543	586	109	14,129
NH3	189	438	520	101	452	572	215	102	246	265	49	6,399
CL	2,653	6,129	7,276	1,412	6,334	8,010	3,011	1,427	3,440	3,713	689	89,589
BOD	12,126	28,021	33,264	6,456	28,953	36,616	13,764	6,525	15,726	16,974	3,150	409,548
TSS	87,916	203,149	241,161	46,804	209,912	265,467	99,787	47,309	114,015	123,065	22,840	2,969,224
TDS	51,537	119,087	141,370	27,437	123,052	155,619	58,496	27,733	66,836	72,141	13,389	1,740,580
Cd	0.8	1.8	2.1	0.4	1.8	2.3	0.9	0.4	1.0	1.1	0.2	26
Cu	18	42	50	10	43	55	21	10	24	25	5	614
Pb	19	44	52	10	45	57	22	10	25	27	5	642
Zn	59	137	162	31	141	179	67	32	77	83	15	1,997

2003 Seasonal Pollutant Loadings (pounds)

Fall (September-November)

Pollutant	Beaver Lake 1	Belt Line 2	Lake Phalen 3	Trout Brook 4	Lake Como 5	St. Anthony Park 6	Phalen Creek 7	St. Anthony Hill 8	Griffith/ Pt. Douglas 9	West Kittsondale 10	Urban 11	Battle Creek 12
TP	21	367	97	568	135	388	202	376	65	131	45	136
TDP	7	121	32	187	44	128	66	124	21	43	15	45
TKN	100	1,736	458	2,688	638	1,837	955	1,781	306	621	212	644
NO3ON2	27	466	123	721	171	493	256	478	82	167	57	173
NH3	16	270	71	417	99	285	148	277	48	96	33	100
CL	328	5,660	1,492	8,764	2,081	5,990	3,113	5,809	998	2,026	690	2,100
BOD	749	12,937	3,411	20,033	4,757	13,691	7,114	13,278	2,280	4,631	1,577	4,799
TSS	4,056	70,073	18,474	108,511	25,766	74,161	38,536	71,920	12,351	25,087	8,542	25,997
TDS	4,305	74,385	19,611	115,188	27,352	78,724	40,908	76,346	13,111	26,631	9,068	27,596
Cd	0.1	1.1	0.3	1.7	0.4	1.1	0.6	1.1	0.2	0.4	0.1	0.1
Cu	1	20	5	31	7	21	11	20	3	7	2	2
Pb	1	17	4	26	6	18	9	17	3	6	2	2
Zn	4	66	17	102	24	70	36	67	12	24	8	8

Pollutant	Downtown 13	East Kittsondale 14	Mississippi River Blvd. 15	Goodrich/ Western 16	Pigs Eye 17	Riverview 18	Highwood 19	West Seventh 20	Crosby 21	Davern 22	Hidden Falls 23	Mississippi River Total
TP	116	268	318	62	277	350	132	62	150	162	30	3,919
TDP	38	88	105	20	91	115	43	21	50	53	10	1,291
TKN	549	1,270	1,507	292	1,312	1,659	624	296	713	769	143	18,555
NO3ON2	147	341	404	78	352	445	167	79	191	206	38	4,979
NH3	85	197	234	45	204	258	97	46	111	119	22	2,881
CL	1,792	4,140	4,914	954	4,278	5,410	2,033	964	2,323	2,508	465	60,507
BOD	4,095	9,462	11,233	2,180	9,777	12,365	4,648	2,204	5,311	5,732	1,064	138,301
TSS	22,181	51,254	60,844	11,809	52,960	66,977	25,176	11,936	28,766	31,049	5,762	749,130
TDS	23,546	54,408	64,589	12,535	56,220	71,098	26,725	12,671	30,536	32,960	6,117	795,230
Cd	0.3	0.8	0.9	0.2	0.8	1.0	0.4	0.2	0.4	0.5	0.1	12
Cu	6	14	17	3	15	19	7	3	8	9	2	211
Pb	5	12	15	3	13	16	6	3	7	7	1	179
Zn	21	48	57	11	50	63	24	11	27	29	5	703

Appendix N

Outfall Inventory

Outfall Inventory

Outfall	Location	Watershed	Pipe Size	Acres
	Bridal Veil Creek			
005	South of Buford	Bridal Veil	42"	
	Mississippi River			
010	Eustis	St. Anthony Park	tunnel	2467
020	Lotus	Miss. River Blvd.	tunnel	31
030	Marshall	Miss. River Blvd.	tunnel	121
040	West Kittsondale	West Kittsondale	tunnel	977
050	Otis	Miss. River Blvd.	tunnel	14
060	Portland Ave	Miss. River Blvd.	tunnel	508
070	Summit	Miss. River Blvd.	16" cast iron	30
080	Goodrich	Miss. River Blvd.	tunnel	456
090	Princeton	Miss. River Blvd.	tunnel	150
095	Berkeley	Miss. River Blvd.	24"	
100	Jefferson	Miss. River Blvd.	tunnel	139
110	Randolph	Miss. River Blvd.	tunnel	39
115	Hartford	Miss. River Blvd.	tunnel	580
120	Scheffer	Miss. River Blvd.	tunnel	8
130	Highland Parkway	Miss. River Blvd.	tunnel	165
135	Hidden Falls	Hidden Falls	48"	269
140	Sheridan	Davern	tunnel	145
145	West 7th	Davern	30"	30
150	Davern	Davern	tunnel	963
151	Watergate Marina	Crosby	21"	
156	Elway	Crosby	60"	
158	Elway	Crosby	90"	820
160	Otto	E. Kittsondale	tunnel	177
170	Bay	E. Kittsondale	tunnel	1699
180	Sumac	West 7th	tunnel	8
190	Drake	West 7th	tunnel	158

Outfall Inventory

Outfall	Location	Watershed	Pipe Size	Acres
195	Fountain Cave	West 7th	42"	39
200	Richmond	West 7th	20"	142
201	Richmond	West 7th	42"	
206	Western	West 7th	30"	98
210	Smith -1992	Good/West	tunnel	424
220	Sherman	Downtown	48"	41
230	Chestnut	Downtown	27"	82
240	Eagle	Downtown	3'x5' brick	77
~~250~~	~~Ontario~~ abandoned	~~Downtown~~	~~24"~~	
260	Market	Downtown	24"	
270	St. Peter	St. Anthony Hill	tunnel	2653
280	Cedar	Downtown	tunnel	
290	Minnesota	Downtown	tunnel	115
295	Robert	Downtown	tunnel	5
300	Jackson	Downtown	36"	27
310	Sibley	Downtown	48"	10
~~315~~	~~Wacouta~~	~~Downtown~~	~~12"~~	~~10~~
320	Broadway	Downtown	7'x8' concrete	115
325	Troutbrook	Troutbrook	dual 10'	4025
330	Plum	Phalen Creek	tunnel	1406
340	Urban	Urban	48" brick	328
343	Warner and Childs	Pig's Eye	24"	
346	Warner and Childs	Pig's Eye	18"	
350	Beltline	Beltline	9'	3524
352	off Child's Road	Pig's Eye	12"	
354	off Child's Road	Pig's Eye	12"	
356	off Child's Road	Pig's Eye	12"	
360	Battle Creek	Pig's Eye	36"	
365	Wyoming	Riverview	30" culvert	8
380	Page and Barge Ch Rd	Riverview	42"	69

Outfall Inventory

Outfall	Location	Watershed	Pipe Size	Acres
385	Robie and Witham	Riverview	54"	
390	Robie and Kansas	Riverview	42"	264
400	Airport	Riverview	12"	
405	Chester St	Riverview	tunnel	326
407	Eva St	Riverview	36"	
410	Custer St	Riverview	tunnel	188
420	Moses St	Riverview	5'6"	95
430	Belle	Riverview	2-36"x40"	37
440	Riverview	Riverview	2-77"x121"	801
460	Chippewa and Baker	Riverview	16"	71
	Upper Lake			
152	Springfield	Crosby	15"	
	Crosby Lake			
153	Rankin	Crosby	27"	
154	Homer	Crosby	30"	
155	Leland	Crosby	30"	
	Fairview North Pond			
500	Tatum & Pierce Butler	St. Anthony Park	6'	
510	Pierce Butler & Aldine	St. Anthony Park	54"	
	Lake Como			
520	Arlington & Chelsea	Como	60"	310
530	Chatsworth North	Como	36"	201
540	Milton North	Como	36"	79
550	Parkview East	Como	18"	17
560	Ivy East	Como	18"	24
570	Wheelock Pkwy East	Como	24"	23
580	Rose East	Como	36"	30
590	Victoria South	Como	30"	49
600	Chatsworth South	Como	24"	75
610	Horton West	Como	15"	311
620	Park West	Como	36"	50
	Loeb Lake			
630	Jessamine	Troutbrook	36"	

Outfall Inventory

Outfall	Location	Watershed	Pipe Size	Acres
	Lake Phalen			
680	Arlington West	Phalen	72"	380
690	Blomquist South	Phalen	36"	71
700	Arlington East	Phalen	42"	209
710	between Hoyt & Neb.	Phalen	42"	69
720	Larpenteur East	Phalen	84"	17
	Beaver Lake			
730	Rose North	Beaver	42"	67
740	McKnight North	Beaver	21"	22
	Suburban Pond			
750	Suburban & WB Ave	Battle Creek	27"	
760	Suburban & Hazel	Battle Creek	54"	
	Little Pig's Eye Lake			
770	near fish hatchery	Griffith/Pt. Douglas	72"	
	Pig's Eye Lake			
780	North End	Highwood	66"	
790	Springside Drive	Highwood	33"	
	Battle Creek			
800	N. Park Drive & Faye	Battle Creek	33"	
810	Ruth	Battle Creek	42"&73-1/2" arch	
820	Winthrop & N. Park Dr	Battle Creek	36"	
830	McKnight & N. Park Dr	Battle Creek	36"	

Appendix O

Fertilizer Information

Minnesota's Phosphorus Lawn Fertilizer Law (R. Struss, UM Extension, 1/9/03)

The Phosphorus Lawn Fertilizer Bill (SF 1555) was signed into Minnesota state law April 19, 2002. The following is a summary of the law as found in Chapter 18 of Minnesota Statues (M.S.) (http://www.revisor.leg.state.mn.us/stats/18C/). For more information, contact Jerry Spetzman at the Minnesota Department of Agriculture, 651-297-7269 or *jerome.spetzman@state.mn.us*.

- **PREEMPTION OF LOCAL LAW** (M.S. Chapter 18C.110)

  Local units of government may not adopt or enforce ordinances regulating the sale, handling, or use of phosphorus fertilizers for **agricultural use** (growing of crops). **Starts April 20, 2002.**

  Except as provided in M.S. Chapter 18C (see 18C.60 Subd. 2c), local units of government may not adopt or enforce ordinances regulating the sale, handling or use of phosphorus fertilizers **on lawns. Starts January 1, 2004.**

  Local ordinances that regulate the **sale** (not use) of phosphorus lawn fertilizer that are in effect by August 1, 2002 will be allowed to stay in effect after January 1, 2004.

- **PHOSPHORUS LAWN FERTILIZER USE RESTRICTIONS** (M.S. Chapter 18C.60)

  Starting January 1, 2004:

  - Lawn fertilizer is restricted to **0% phosphate** (P_2O_5) content in the seven county Twin Cities metro area, **3% phosphate** (P_2O_5) content in other areas of the state **unless** it is for a new lawn, or a soil or tissue test shows a phosphorus need. In those cases, lawn fertilizers with higher phosphate content can be used

  - Golf course employees that have been trained in a program approved by the Minnesota Dept. of Agriculture can use phosphorus fertilizer according to their professional judgment.

  - Local units of governments outside the seven county Twin Cities metropolitan area can adopt the 0% phosphate limit, but need to inform the Minnesota Dept. of Agriculture of the change.

  - When applied, phosphorus lawn fertilizer needs to follow rates recommended by the University of Minnesota and approved by the Minnesota Department of Agriculture.

  Consumer information needs to be provided by Minnesota Department of Agriculture in consultation with University of Minnesota, fertilizer industry, lake groups, and others.

  Evaluation of research needs to be done by the Minnesota Dept. of Agriculture in cooperation with the University of Minnesota and consultation with fertilizer industry, lake groups, and others.

  A report of effectiveness of the phosphorus law is due to the legislature by January 15, 2007.

- **FERTILIZER APPLICATION TO IMPERVIOUS SURFACES** (M.S. Chapter 18C.61)

  It is prohibited to spill or spread fertilizer on impervious surfaces (paved areas such as sidewalks, driveways, and streets). If such a spill or spreading occurs it must be cleaned up immediately. This applies to all fertilizer, whether it contains phosphorus or not. **Starts August 1, 2002.**

- **ENFORCEMENT** (M.S. Chapter 18C.62)

  Restrictions and probations in this law are enforced by local units of government under their existing authority. Violations are a petty misdemeanor.

END

Appendix P

Storm Water Management Site Plan Review Worksheet

STORMWATER MANAGEMENT

Site Plan Review City of Saint Paul

A stormwater management plan must be submitted as part of the site plan package for review by the Department of Public Works. The purpose of the plan is to show how stormwater will be handled on the site: where it will drain to and at what rate.

SITES SMALLER THAN ONE QUARTER ACRE

On small sites it may be possible to meet the requirements for stormwater management simply by grading the site so that stormwater flows to a street or a public alley. Stormwater drainage must be shown on the plan by grades and/or drainage arrows. Stormwater may not drain across a public sidewalk at any point except at a driveway.

SITES LARGER THAN ONE QUARTER ACRE

For sites larger than one quarter of an acre, the rate of storm water runoff for the site may not exceed 1.64 cubic feet per second per acre. stormwater must normally be directed to on-site stormwater detention ponds and catch basins connected to the City storm sewer system in order to control the rate of stormwater runoff from the site. The following information must be submitted:

Grading

- Grades or contours to define the routing of stormwater and stormwater detention areas.

Drainage areas

- Outline of each separate drainage area within the site property lines or improvement limits. Include roofs and all other surface areas.
- Area in square feet of each drainage area.
- Area in square feet of area of pervious and impervious surfaces for each drainage area .

Detention Areas

- Outline of each separate detention area. Ponding may be provided in parking lots, green areas, roof tops or underground storage.
- Depth of detention areas.
- Area in square feet of detention areas
- Area of contour intervals from bottom to top of detention areas.
- Detention area overflow route

Structures

- Location and details of all structures used to control the rate of discharge of stormwater from the site. These include catch basins, manholes, pipes, weirs, curb openings, control flow roof drains. Rim and invert elevations must be provided.

Connections to public sewers

- Connections are not permitted to public catch basins or sanitary sewers. Connections to combined sewers are permitted only with the approval of Public Works.
- Connections must be no deeper than 5 feet to invert at the property line.
- The plan must include a note stating "Connections to public sewers must be done by a Licensed House Drain Contractor under a permit from Saint Paul Department of Public Works."

Calculations

- Calculate allowable discharge rate and required detention for the critical 100 year rainstorm event.
- Calculations must be shown on the worksheet provided inside this handout.
- The standard used to check for conformance with stormwater management requirements is the City's computer "Hydro program, which utilizes a Modified Curve Number Method as outlined in the USDA, SCS, Technical Release No. 55. This method takes into consideration the factors of land use and area as well as soils type, slope and time of concentration.

Please call Ila Shah of Saint Paul Public Works at 651-266-6231 if you have questions.

STORMWATER MANAGEMENT WORKSHEET

1. DATA FOR EACH DRAINAGE AREA

Use the table below to define each drainage area on the site.

DRAINAGE AREA NAME	AREA (SQ. FT.)	IMPERVIOUS AREA (SQ. FT.)	PER CENT IMPERVIOUS	AVERAGE SLOPE OF PREVIOUS AREAS
TOTAL				

2. ON-SITE DETENTION

The following table includes a summary of total rainfall depth for various duration 100 year storms in Saint Paul. Use the table to calculate the amount of on-site detention required. The maximum storage value is the required amount of on-site detention. The maximum storage value usually occurs at the 15 or 30 minute time.

TIME (MINUTES)	RAINFALL (INCHES)	RUNOFF (CU. FT.)	TO SEWER (CU. FT.)	STORAGE (CU. FT.)
5	0.84			
10	1.38			
15	1.76			
30	2.44			
60	3.15			
120	3.50			

Time:
From "100 year storm" data*

Rainfall:
From "100 Year Storm" data*

Runoff=

$$\frac{\text{Rainfall x C x Area in Square feet}}{12}$$

(1 ACRE = 43,560 SQ. FT.)

To Sewer:
Time x 60 x 1.64 x Area in Acres

Storage=
Runoff - To Sewer

Allowable Q = 1.64 c.f.s / Acre

C = $\frac{(.95 \text{ X Impervious Area}) + (.25 \text{ X Pervious})}{\text{Total Area}}$

Note: The term "100 Year Storm" as used in this table refers to a storm of a given duration and rainfall depth which has a one percent probability of occurring during any given year in a particular location. The information is taken from "Five to 60 Minute Precipitation Frequency for the Eastern and Central United States" and "Technical Paper No. 40: Rainfall Frequency Atlas of the United States". Both of these publications are prepared by the National Weather Service.

3. DETENTION DATA

Define detention areas within property lines and outline maximum pond contour elevation. Give calculations for detention volumes. For irregular shaped detention areas with defined contours between bottom and top elevations, the following formula may be used:

$V = (h/3)\,(A_1 + A_2 + \sqrt{A_1 x A_2})$

Where:
h = difference in elevation between contours in feet
A_1 & A_2 = areas of contours in square feet

Note: The volume between the bottom elevation and the next highest contour should be V=(hA)/3

ELEVATION	h	AREA (SQ. FT.)	VOLUME (CU. FT.)
BOTTOM		0	-
CONTOUR			
CONTOUR			
CONTOUR			
TOP			

4. PIPE SIZE AND ELEVATION

Detention area discharge rates must be given for each detention area. The formula for calculation must be given along with any constant values used in the formula. Discharge controls may include only permanent unalterable fixtures such as sized pipes, curb weirs and control flow roof drains. Orifice plates and grate controls are not allowed.

Most flow control should be by pipe size. Minimum pipe size required is 4" diameter. Pipe flow rates may be approximated by use of the following orifice equation;

$Q = CA\sqrt{2gh}$

Where:

Q = discharge in cubic feet per second
C = 0.65
A = Area of orifice in square feet
2g = 64.4
h = height of water above center of orifice in feet

The standard flow rate will be determined by the city's computer program which considers other factors, including head, entrance loss, pipe loss and exit loss.

The following data must be provided for all pipe controlled discharges:

PIPE LENGTH	DIAMETER IN INCHES	PIPE TYPE	UPSTREAM WATER ELEVATION	UPSTREAM INVERT ELEVATION	DOWNSTREAM WATER ELEVATION	DOWNSTREAM INVERT ELEVATION

Note: For off site discharge to city storm sewer, the following assumption can be made:
Downstream water elevation = Downstream invert elevation

Appendix Q

Permitting Process

U.S. Army Corps of Engineers Section 404 Permit Program
Section 404 of the Federal Clean Water Act regulates through the COE the action of putting fill or dredged material into any water or wetland area. The applicant must prove that there are no other alternatives and that mitigation can be accomplished. Mitigation will create water or wetland areas having values sufficient to offset the values lost because of the fill. A national goal is to avoid any net loss of wetlands.

GP-17
A COE general permit (GP-17) can authorize certain projects that require both MDNR and COE permits. The COE and the DNR developed this GP to reduce regulatory duplication for the public. It will not apply if your project has been denied a state or local permit. The District has recently received authority from the COE to administer GP-17 permit applications and to review for 404 permit approval any projects in the District which affect between ½ and 3 acres of wetland as long as WCA approval has also been granted. The District sends a copy of the Replacement Plan to the COE for comment before approval. The work which the District performs in this permit process includes:

- Wetland delineation
- Coordination of wetland disturbance projects with other agencies
- Replacement plan review
- Notification of wetland alteration
- Meetings
- Training sessions
- Internal procedures
- Misc. administrative and technical assistance
- Monitoring wetland replacement
- Identifying wetland priorities
- Wetland banking certification

National Pollutant Discharge Elimination System (NPDES) Permit
The U.S. Clean Water Act and Minnesota Statutes Chapter 115 and 116 regulate discharges to natural receiving water bodies through NPDES permits. St. Paul received its initial NPDES permit in 1975 to operate the combined sewer system and to discharge combined sewer overflows to the Mississippi River. In 1985 this permit, which included a ten year sewer separation program, was reissued to the City of St. Paul and the Metropolitan Council. The sewer separation construction program has been completed. The City of St. Paul obtained an NPDES Storm Water Discharge Permit from the MPCA on December 1, 2000. This permit is required for cities with populations over 100,000.

State Permit Programs

MPCA Construction Site Permits for Over One-Acre Disturbances

- Any construction activity that disturbs one acre or more of land area is required to apply for an MPCA NPDES permit. Construction activity includes clearing, grading,

excavation, road building, demolition, and construction of residential houses, office buildings, commercial facilities, or industrial buildings.

MPCA Industrial Stormwater Permits

- The goal is to reduce the contact between significant materials and stormwater. Significant materials are those which are major contributors to water quality degradation. Examples of significant materials are: raw materials (coal, iron ore, bauxite, potash), fuels (oil, kerosene, natural gas), solvents, detergents, plastic pellets, finish materials (cement, chemicals, manufactured goods), metallic products (steel, aluminum, iron), pesticides, hazardous substances designated under section 101 (14) of CERCLA, any chemical reported pursuant to Section 313 of Title III of SARA, waste products such as sludge, slag and ash. Biological materials also decompose to degrade water quality of fresh water bodies: flood processing raw materials (sunflower oil, corn syrup), food production raw materials (corn, rice, wheat, soybeans), fertilizers.
- A pollution prevention plan is required that includes BMPs to control stormwater. The plan must identify significant materials found at the site, show how pollution sources will be identified and eliminated.

MPCA Water Quality Permits

For discharges of wastewater and construction dewatering.

MPCA Solid Waste Permits

For any disposal of nonhazardous solid waste on property owned by businesses processing, storing or transferring solid waste.

MPCA Hazardous Waste Permits

For treatment, storage or on-site disposal of wastes considered hazardous because of ignitability, corrosivity, reactivity, toxicity or oxidizing characteristics.

MPCA Liquid Storage Permits

Required for all above-ground storage tanks that hold materials capable of polluting the water of the state.

DNR Protected Waters Permits

- Required to do any work which will change or diminish the course, current, or cross-section of any lake, marsh or stream that is designated as a protected water or wetland on the DNR's *Protected Waters and Wetlands Inventory* maps. Protected waters are all water basins and watercourses that meet the criteria set forth in the Minn. Statutes Section 103G.005, subd. 15. Protected wetlands are types 3, 4, and 5 (Cowardin classification[1])
- Required to do any work below the ordinary high water mark: draining, filling, dredging, channeling, construction of dams, harbors or permanent offshore structures and placement of bridges and culverts.
- DNR can establish a minimum protection elevation for water basins and a protected low flow for watercourses.

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[1] Lewis M. Cowardin *Classification of Wetlands and Deepwater Habitats of the United States*, FWS/OBS-79/31. U.S. Fish and Wildlife Service, U.S. Department of Interior, 1979.

DNR Water Appropriation Permit
Required to appropriate or use state waters for domestic use serving more than 25 persons and for any other use which exceeds 10,000 gallons/day or 1 million gallons /year.

DNR Shoreland and Floodplain Zoning Regulations
DNR regulates lands adjoining protected waters and wetlands. Shoreland ordinances are required to specified counties and cities on a priority basis. DNR sets minimum land use standards which local units of government must adopt and enforce through their zoning ordinances, except that planned unit development must be approved directly by the DNR.

- Shoreland zoning ordinances apply to all land within 1,000 feet of the shore of a protected water basin or wetland and within 300 feet of a protected watercourse or landward extent of a designated floodplain. Standards vary according to the water body classification; standards include land use, lot size, lot width, structure setbacks and sanitary system setbacks.
- Floodplain zoning ordinances apply to lakes and streams and cover all land inundated by 100-year storm events. The floodway is protected as it is needed to carry off the resulting flows. Development along the floodway fringe must conform to the City's shoreland zoning standards as long as it remains protected from 100-year flood damage.

County Permit Programs

Excavation or Obstruction Permit
Ramsey County requires a permit for the management of utilities in the public right-of-way in accordance with county ordinance 2001-287.

Watershed District Permit Programs

Ramsey-Washington Metro Watershed District Permit
Ramsey-Washington Metro Watershed District requires a permit for grading activities within district boundaries. The permit application is available on the watershed district website at http://www.rwmwd.org/.

Source: Ramsey-Washington Metro Watershed District Comprehensive Watershed Management Plan. 1997.

City of St. Paul

The City requires a permit for building activity, land disturbing activities, and wetland alteration. Projects need to be in conformance with City ordinance, the Local Surface Water Management Plan, and the Wetland Conservation Act. The project may also be subject to other watershed district standards or rules. As stated in City Ordinance, a site plan review form must be filled out to apply for a permit. This information is available at the City of St. Paul's web-site at http://www.ci.stpaul.mn.us/depts/liep/General/index.php.

Appendix R

Street Management Program

Street Management

Responsible department: Public Works Street Maintenance.

Targeted Pollutants: Sediments, nutrients, oxygen-demanding substances, chlorides

Performance Measures: Frequency of sweeping on each street type, quantity and breakdown of materials removed. Quantity of deicing and anti-icing materials used.

Permit Section: 2.8 Roadways

Street Cleaning and Maintenance Program

The City of Saint Paul conducts a street and alley cleaning program to promote the health and welfare of its citizens and to reduce the amount of pollutants to receiving waters from storm water discharges. Streets and alleys are divided into seven classes, each of which receives a different level of service as defined below:

Class I-A - Downtown or Loop streets

The following service is performed on all downtown or loop streets within the following boundaries: Kellogg Boulevard on the south and west, Twelfth Street on the north and Broadway Street on the east.

These streets are swept approximately three times per week during the spring, summer, fall and winter as weather allows. All routine maintenance, including patching and repairing of street surfaces, is performed on an as-needed basis.

Class I-B - Downtown Streets (Brick)

The following service is performed on all downtown brick streets (face of curb to face of curb): St. Peter St., from Kellogg Blvd. to Sixth St.; Wabasha, from Kellogg Blvd to Sixth St.; Fourth St., from St. Peter to Wabasha; Fifth St., from St. Peter to Wabasha; Sixth St., from St. Peter to Wabasha.

These streets are swept approximately three times per week during the spring, summer, fall and winter as weather allows. All routine maintenance, including patching and repairing of street surfaces, is performed on an as-needed basis.

Class II - Outlying Commercial and Arterial Streets

These streets are the major arteries in the City and have both heavy volumes of vehicular and pedestrian traffic. These streets also have business or commercial properties fronting on them. Typical examples are: University Avenue, Snelling Avenue, West Seventh Street, East Seventh Street, Rice Street, Payne Avenue, Arcade Street, Summit Avenue and Grand Avenue.
The Class II streets are swept or cleaned fifteen to eighteen times annually, every two weeks in April, May, October, and November for spring and fall cleanup; every three weeks for June thru September for litter, tree debris and whatever else. All routine maintenance, including patching and repairing of street surfaces, is done on a scheduled or as-needed basis.

Class III - Residential Streets

The following service is performed on all residential streets including oiled, paved and intermediate type streets.

In the spring, all residential streets receive a thorough sweeping. Patching and repairing is done on a scheduled or as-needed basis. Street Maintenance initiated the following policy in August 1997: Oiled streets are chip sealed on a five-year cycle until the oiled street is scheduled to be paved as part of the Residential Street Vitality Program. The street is then added to the ten-year cycle chip seal list. All existing paved streets are on the ten-year cycle chip seal list. In 2001, the chip sealing cycle for these oiled and paved streets was changed to every eight years. Approximately 12 miles of oiled streets and 60 miles of paved streets were chip sealed in 2003. Oil and sand sealing of oiled streets is no longer done. In 1995, a recycling program was initiated for all reclaimed sand and seal rock. These materials are no longer hauled to the landfill. In the Fall, streets are swept for leaf pickup. All material swept up during this Fall cleanup is hauled to a commercial composting facility.

Class IV - Oiled and Paved Alleys

All oiled and paved alleys are swept during the late Spring. All routine maintenance, including patching and repairing of the alley surfaces, is performed on a scheduled or as-needed basis. Street Maintenance initiated the following policy in August 1997: Oiled alleys are chip sealed on a five-year cycle. Paved alleys are chip sealed on a ten-year cycle. In 2001, the chip sealing cycle for these oiled and paved alleys was changed to every eight years. Oil and sand sealing of oiled alleys is longer done. In 1995, a recycling program was initiated for all reclaimed sand and seal coat rock. These materials are no longer hauled to the landfill.

Class V and VI - Unimproved Streets and Alleys

Unimproved streets and alleys are right-of-ways that have not been developed. There are approximately 50 miles of unimproved streets and approximately 288 miles of unimproved assessed alleys in the City. Because they are City right-of-ways, the City has the responsibility to perform minimal repairs and maintenance work on them to make them passable and to reduce hazards. The maintenance and repair of these streets and alleys consists of patching, minor blading, and placing of crushed rock or other stabilized material.

Debris Collection

Sweeping is a major operation for the Street Maintenance Division and is done every month of the year, day and night. Elgin Pelican mechanical sweepers handle the vast majority with an Elgin Crosswind Regenerative air sweeper utilized Downtown. In recent years, the target date for completion of spring sweeping has moved up from Memorial Day to May 15th. The primary material swept in the spring is sand from ice control operations. Fall cleanup is done during the last week of October and the first half of November. The fall sweep is timed so that a majority of the leaves are down and enough time is allowed to sweep all St. Paul streets before the November snows. Over 25 years ago the timing of the fall leaf sweeping revolved around the Elm tree. Currently the wide variety of trees with varying leaf drop times makes it impossible to wait for all of the leaves to drop. To compensate for this, touch up sweeping continues most years through November and early December. In the interest of continued improvement to our sweeping program, workers attend training and best management practices are implemented.

In 2001, the sweepings collected from city streets and alleys were tested and found to be within EPA guidelines for recycling purposes after screening out waste and debris. Only 7 to 10% of swept up material is disposed of in a landfill. The following table shows the volumes removed from City streets in 2003.

2003 Street Cleaning Quantities

Class	General Debris (Cubic Yards)	Leaves - Fall Cleaning (Cubic Yards)
I & II	5,472	5,614
III	4,428	17,108
IV	1,248	0
Totals	11,148	22,722

Street Maintenance has a Hazardous Waste Disposal Policy in place. Any of these materials collected from city streets are disposed of in environmentally acceptable means. Street Maintenance also services over 300 trash receptacles and disposes of refuse from neighborhood cleanups each year.

Ice Control Operations

Minnesota weather requires ice control from late September through early May. Frost forming on bridge decks is usually the first and last ice control event during the winter season. Early November through mid April the need for pavement treatment is determined by temperature and precipitation. Frequency of snow events through the winter season influences amounts of material used. The City's foremost objective is to maintain safe roads for all users. The consequences of icy roads are longer travel times, adverse economic impact, accidents and injuries.

Salt is the primary material used to melt snow and ice. Salt is theoretically effective to -6 • F but factors such as darkness, continuing snow, temperatures below 10 • F or type and quantity of precipitation all reduce melting performance. Sand is an abrasive sometimes used in conjunction with salt to enhance traction; usually when temperatures are below 10 • F and snowfall amount is likely to be greater than 3 inches. Specific application rates are decided upon for each snow event and adjusted to the minimum amount necessary to achieve the desired results.

St. Paul has made use of alternative ice control products for the past several years. The best results have been with liquid magnesium chloride blends applied to selected bridge decks, anti-icing to prevent bridge frost. One application of 25 gallons per lane mile eliminates frost formation twice before needing re-application. Our evolving plan currently is to spray 16 bridges in the City, when conditions are favorable for good performance. This program is reducing salt and sand/salt use. Another product of significant interest is salt treated with liquid magnesium chloride and agricultural byproducts. Potential benefits: better melting performance, residual value, and reduction in amount of salt used. St. Paul Public Works is a big advocate of networking within the industry for information and regularly attends events such as the American Public Works Association North American Snow Conference.
Salt is covered year round to eliminate runoff. Sand and salt mixture piles are stored in the open from December through February. The City does not store sand/salt mixture during the remainder of the year.

Storage facilities are located at the following locations:

873 N. Dale Street (Increased storage is expected at this location)
510 East 5th Street
310 South Victoria Street

Ice control materials used as of March 1, 2004 for the 2003-2004 Winter Season

20,480	tons salt
3,640	tons sand
2,000	gallons Magnesium Chloride
1,000	tons treated salt

Employee Training

Street Maintenance staff attended MnDOT's Circuit Training and Assistance Program in November of 2003. A total of 70 employees attended the training session on Sensible Material Application for Snow and Ice Control. The main purpose of this session is to train employees to get the most out of every application, maintaining the safest roads possible in the most economical way, while protecting the environment. The session addressed the following: abrasives, salt, pre-wetting. anti-icing, equipment calibration and material storage.