For MWMO use only Application Received: _____

APPLICATION COVER SHEET

ORGANIZATION INFORMATION

Name of Organization: City of Minneapolis Environmental Services
Legal Name (if different):
Address: Public Service Center Rm. 414, 250 South Fourth Street
City, State, Zip: Minneapolis, MN 55415
Employer Tax Identification Number: 41-6005375
Primary Phone: 612-673-5885
Secondary Phone: 612-672-5897 or 612-673-2170
Fax: 612-673-2635
Contact people regarding this application:
Thomas Frame, Supervisor Environmental Management, 673-5807, tom.frame@ci.minneapolis.mn.us
Curt Fernandez, Manager Environmental Health, 673-2175, curt.fernandez@ci.minneapolis.mn.us

FISCAL AGENT

Name of Fiscal Agent (if different than Organization):		
Address:		
City, State, Zip:		
Fiscal Agent Employer Identification Number: 41-6005375		
Title:	Phone:	E-mail:

PROPOSAL INFORMATION

Project Title: Mississippi River Water Quality Indicators	
Please give a short summary of your proposal: Minneapolis Environmental Services (ES) is requesting assistance to continue a program that will benefit the Mississippi Watershed Management Organization and its member communities of Lauderdale, Minneapolis, Minneapolis Park and Recreation Board (MPRB), St. Anthony and St. Paul. The primary goal is to improve the quality of water discharged from Minneapolis storm drainage system to the River. Environmental Services is proposing to perform, with MWMO Staff, bacteria monitoring at seven locations to assess the impact of bacteria levels from point and non-point sources. . Monitoring bacterial point and non-point source contributions provides identification of source loading to the watershed. Six locations are on the Mississippi River and a seventh at Loring Park Pond. Environmental Services is also requesting assistance to send staff, 2 from ES, 1 from MWMO and 1 from MPRB to the United States Environmental Protection Agency Sampling Program in Colorado. This training is designed to teach sampling for detection of illegal discharges known to be harmful to the environment and/or human health. After detecting an illegal point source discharge, the City will assess and address the source. If it is determined that the point source is located in another MWMO member community, ES will work with MWMO staff and that community to address the discharge. Monitoring and assessment will direct targeting for educational programs, community outreach, and policy development.	
Project dates: May 2003 – December 2003.	
Dollar amount requested: $38,000	Total project budget: $38,000
Geographic Area/Community served: Those portions of Lauderdale, St. Paul, St. Anthony and Minneapolis within the MWMO boundaries	Population served:

AUTHORIZATION

Signature: _____ _____
Date

Name (Print) _____ Title (Print) _____

APPLICATION EXECUTIVE SUMMARY

Project Title: Mississippi River Water Quality Indicators

Narrative Project Description:

Continue a sampling program for bacterial monitoring for human health risks at six sites on the river where the public has access and at Loring Park Pond. Review data for impacts and trends with historical data. Communicate those impacts with the MWMO and review for development of communication and education to improve water quality from point and non-point sources.

Environmental Services, Mississippi Watershed and Minneapolis Park and Recreation Board staff will attend the US EPA water-sampling course as a first step in development of an intensive program to address illegal discharges to the watershed. The course will provide skills on advanced sampling methods, equipment, rules and documentation requirements.

Project Evaluation:

Environmental Health will coordinate:
Sampling with MWMO staff, analysis with Minneapolis Health Department Labs and prepare summary data review of impacts, trends and data comparisons.

Environmental Management will coordinate:
Arrangements with the US EPA for attendance at and content of sampling course.

Project Funding/Financial:

Sampling from the first full week in May to the last full week in October (May 5th – October 31st, 2003)	**$32,953**
EPA Sampling Course	**$3,620**
Miscellaneous	**$1,427**
Cumulative Total	**$38,000**

Narrative Project Description

1. **Project Title**: Mississippi River Water Quality Indicators

2. **Organization**: Minneapolis Environmental Services serves the residents, businesses and visitors of the City of Minneapolis. Our mission is to protect and enhance the air, water, and land resources of the City of Minneapolis.

3. **Project History**:
The State of Minnesota is known for its quantity and quality of surface water. The Mississippi River provides important recreational opportunities to area residents and visitors and revenue to local businesses. Minneapolis Environmental Services monitors bacteria levels in surface waters used for drinking water and recreational purposes. Bacterial monitoring provides environmental professionals with the data to quantify bacteria present in surface waters and the associated risks to human health. Environmental professionals and park managers can use the data to make informed, scientifically supported decisions about issuing a beach advisory to swimming or other recreational uses. Infants, children, elderly and persons with weakened immune systems have the greatest susceptibility to illness from highly contaminated surface water. People who swim and recreate in water contaminated with fecal pollution are at an increased risk of becoming ill because of pathogens from the fecal matter. For example, people could contract gastrointestinal disease; non-gastrointestinal disease, such as respiratory, ear, eye, and skin infections; or other illnesses such as meningitis or hepatitis.

According to Minnesota Department of Health statistics, there were two confirmed waterborne outbreaks in 2001 associated with recreational water contact. One outbreak associated with infection with a viral organism, *calicivirus gastroenteritis* during which 67 persons became ill. The second was bacterial infection of 20 persons ill with 5 hospitalized with *Escherichia Coli*. With improved efforts of monitoring and testing, illness from swimming in contaminated waters could be reduced, but that is only a small part of the solution. The number of recreational water outbreaks is probably underreported and is never detected. Reasons include that people do not think that recreational water can make them sick. Also the longer the time period between swimming and illness the less likely people are to think that they became sick from swimming.

Surface water is contaminated by a chemical, physical or biological means. Biological contamination can occur in the form of bacterial, parasitic or viral manifestations. Two primary areas of contamination are point source and non-point sources. Agricultural and urban run-off compose the majority of non-point source contamination, including new development and on-site wastewater treatment systems. With the increase in development and river use, comes the threat of poor water quality to the recreational resource. Combined Sewer Overflows (CSO), Sanitary Sewer Overflows (SSO), Publicly Owned Treatment Works (POTW), concentrated animal feeding operations (CAFO) and storm water from entities subject to permit discharge restriction program requirements compromise the point source origins of contamination. In the past, monitoring and testing for contamination took days to determine the contributing pathogen (disease causing organism). Fecal Coliform bacteria have been used as an indicator of bacterial contamination in surface water since an Environmental Protection Agency (EPA) -issued guideline in 1986. It is essential to develop rapid indicator methods using an indicator organism that is directly linked to human health risk assessment. The Minneapolis Public Health Laboratory is state certified and has the means to test and provide results in 24 hours. To determine bacterial levels with real-time results involves sophisticated technology. Metropolitan area city environmental agencies are working together to develop uniform action levels for the Metro area. Adoption/Implementation of the US EPA guidelines is expected by Spring of 2004. The EPA- recommended indicator species and numerical levels are:

> ***Escherchia Coli* (E-Coli)** at a single test exceeding 235 colony-forming units per 100 ml of water *or*
> A 5-day geometric mean of samples in a 30-day period averaging above 126 cfu/100 ml of water
>
> ***Enterococci* (Streptococcus)** at a single test exceeding 61cfu/100 ml of water *or*
> A 5-day geometric mean of samples in a 30-day period averaging above 33 cfu/100 ml of water

The current Minnesota and EPA standard for indicator species and numerical levels is

> ***Fecal Coliform*** at a single test exceeding 2000 cfu/100 ml of water *or*
> A 5-day geometric mean of samples in a 30-day period averaging above 200 cfu/ ml

In addition to the above influences, there are environmental factors to monitor and record as part of the recreational water monitoring. Storm water run-off may affect the levels of bacteria dramatically. Cloud cover, water temperature, turbidity of the water, the pH of the water, wave height, wind direction and intensity are a few of the factors recorded at each swimming beach during the monitoring period. The presence of swimmers, waterfowl and domestic animals/wildlife in the swimming area contribute to the problem. Land-use around surface waters in the form of impermeable surfaces or improper grading and banking of soils in a construction area cause erosion and run off which increase turbidity and bacteria levels. The importance of watershed protection in developed areas can reduce the potential for contamination of recreational waters.

The City Of Minneapolis has an ongoing sampling program for monitoring bacterial levels and public health risk concerns for the Mississippi River. Recent budget cuts and new EPA 2004 guidelines for 24-hour analysis and new bacteria indicator species have a multiple impact on the existing sampling program budget. Implementation of the new guidelines results in increased lab costs for analysis and start-up. Budget cuts to Minneapolis Health and Human Services Department that funded lab analysis has resulted in no financial support for analysis for 2003.

4. **Project Objective**: The objectives are to obtain funding to continue the sampling program on the Mississippi River in 2003 and attend the US EPA sampling course. The result will be no data gaps. Analysis using the Fecal Coliform numbers along with analysis following the new EPA Guidelines will allow for a transition and establish a relationship between historical and future data. The information obtained will be available for problem assessment, development of solutions and allow for communication, education and policy development for river users on the status of the water body. Training provided by the United States Environmental Protection Agency provides the expertise on current technology, sampling protocols and analytical methods. With this training, accompanied by existing on laws and documentation, Minneapolis can effectively enforce the rules and regulations.

5. **Project Description**:
Minneapolis Environmental Services will work with MWMO staff to monitor bacteria levels in the surface water on the Mississippi River and Loring Park Pond. While the ideal situation would be to perform continuous real-time monitoring, the reality is that monitoring will take place over 4 consecutive days with a 24-hour lag for analytical results. The data, analyzed over time, will assist the environmental professionals, MWMO and local government officials in making an informed and scientifically supported decision about issuing a beach advisory to swimming or other recreational activities.

The City Of Minneapolis has a program to address illegal waste disposal to the storm drain system and the city/state waters. Enforcement and compliance has relied heavily on visual methods for detection and cooperation from responsible parties to address the problems and impacts. This has, at times, limited the ability to enact effective remediation. The City is moving to step up its illegal discharge program to include an effective sampling/monitoring/analysis program to clearly identify the impacts, sources and causes of pollution to the watershed. Two staff from Minneapolis Environmental Services, one staff from the Mississippi Watershed Management Organization and one staff from the Minneapolis Park and Recreation Board would attend the training in Colorado. Coordination of this effort between City, Watershed and Park Board is important to achieve an effective program. Working together on this program can maximize existing efforts and expertise.

6. **Watershed Goals**: This program enables the MWMO to move forward on its mission by assessing the quality of discharge to the River and development of programs to enact solutions and limit impacts. The final results should encourage a greater diversity of plant and wildlife while increasing the recreational value of the river. The end results and beneficial outcomes of the analysis and measures taken then to improve the water quality discharges to the River will help the MWMO meet five of its Watershed Management Plan goals:

- Goal 3: Protect and enhance the surface water quality.
- Goal 4: Reduce non-point sources of pollution.
- Goal 5: Work with other organizations to improve surface water quality across watershed boundaries.
- Goal 6: Provide opportunities for public outdoor recreation in a way that preserves and enhances the environment.
- Goal 9: Educate communities about environmental impacts to the Mississippi, especially non-point sources of pollution.

7. **Additional Benefits**: Coordination of the training and sampling program will occur with the watershed. Minneapolis staff will provide their expertise to watershed staff on sampling procedure for the bacteria sampling program and the Minneapolis Public Health Lab will provide the lab analysis at cost. The US EPA will tailor the sampling course to the needs of the City of Minneapolis, the Mississippi Watershed Management Organization and the Minneapolis Park & Recreation Board. Watershed and Park Board staff will accompany Environmental Services staff to the US EPA sampling course.

Project Evaluation

1. Describe how will you evaluate the success of the project?
   a. If monitoring is proposed, then describe the methodology, equipment, timeline, responsible party, etc. to execute the monitoring program.
   b. If models are used to estimate before and after project conditions for the reduction of sediment, nutrient, or chemical inputs to the river, then describe the method used.

Two parts: Sample data acquisitions, analysis for bacteria and summary review for impacts and trends. Acquire and use technical skills obtained from training on US EPA advanced techniques for water quality sampling.

Samples will be collected from seven sites in the watershed, six on the Mississippi and one from Loring Park Pond. Four samples will be collected each week for 26 weeks from May 5th to October 31st. 728 total samples will be collected and each sample will be analyzed for three indicators for bacteria and public health risk: Fecal Coliform, Fecal Streptococcus (*Enterococci*) and E-Coli (*Escherchia Coli*). Laboratory results will be reviewed against State standards for Fecal Coliform and EPA guidelines for Fecal Streptococcus and E-Coli. Results will also be reviewed for trends and data comparisons. Data comparison of the three test results for each sample collected will be done for agreement, consistency, and application to future sampling and analysis. MWMO and Environmental Services Staff following standard protocol will take samples. Samples will be submitted to the state certified Minneapolis Health Department Lab for analysis following established Minnesota Department of Health state and EPA analytical methods.

US EPA training will provide city and watershed staff additional training and expertise on EPA methods for sampling, analysis and chain of custody for detailed work regarding samples taken for detail water quality analysis and illegal discharges to the existing storm drain system.

2. Describe how the evaluation will be disseminated and to whom.

Sampling results will be accumulated and information shared with Mississippi Watershed Management Organization. The information will also be incorporated into several City Of Minneapolis documents such as the State of the City report and the City's annual NPDES report.

Funding/Financial

Sampling: First full week in May to the last full week in October (May 5th – October 31st, 2003)

Sites	Cost per	Units	(Dys)(wks)	Total
Six Locations on the Mississippi River		6		
One Location Loring Park Pond		1		
Total sites		7		
Samples taken four days per week (M-Th, alternate day Friday) for 26 weeks (4 x 26 = 104)			104	
Analysis for Fecal Coliform, Fecal Streoccus (*Entercocci*), E-Coli (*Escherchia Coli*)				
Fecal Coliform	$15	7	104	$10,920
Fecal Streoccus (*Entercocci*)	$15	7	104	$10,920
E-Coli *(Escherchia Coli)*	$15	7	104	$10,920
Global Positioning Satellite Unit	$193	1		$193
Total Cost				$32,953

EPA Sampling Course arrive Monday leave Friday

United States Environmental Protection Agency Sampling Course				No Charge
Four People (4)				
Flight Travel	$300	4		$1,200
Lodging	$80	4	4	$1,280
Food	$40	4	4	$640
Local Travel	$100	1	5	$500
Total				$3,620

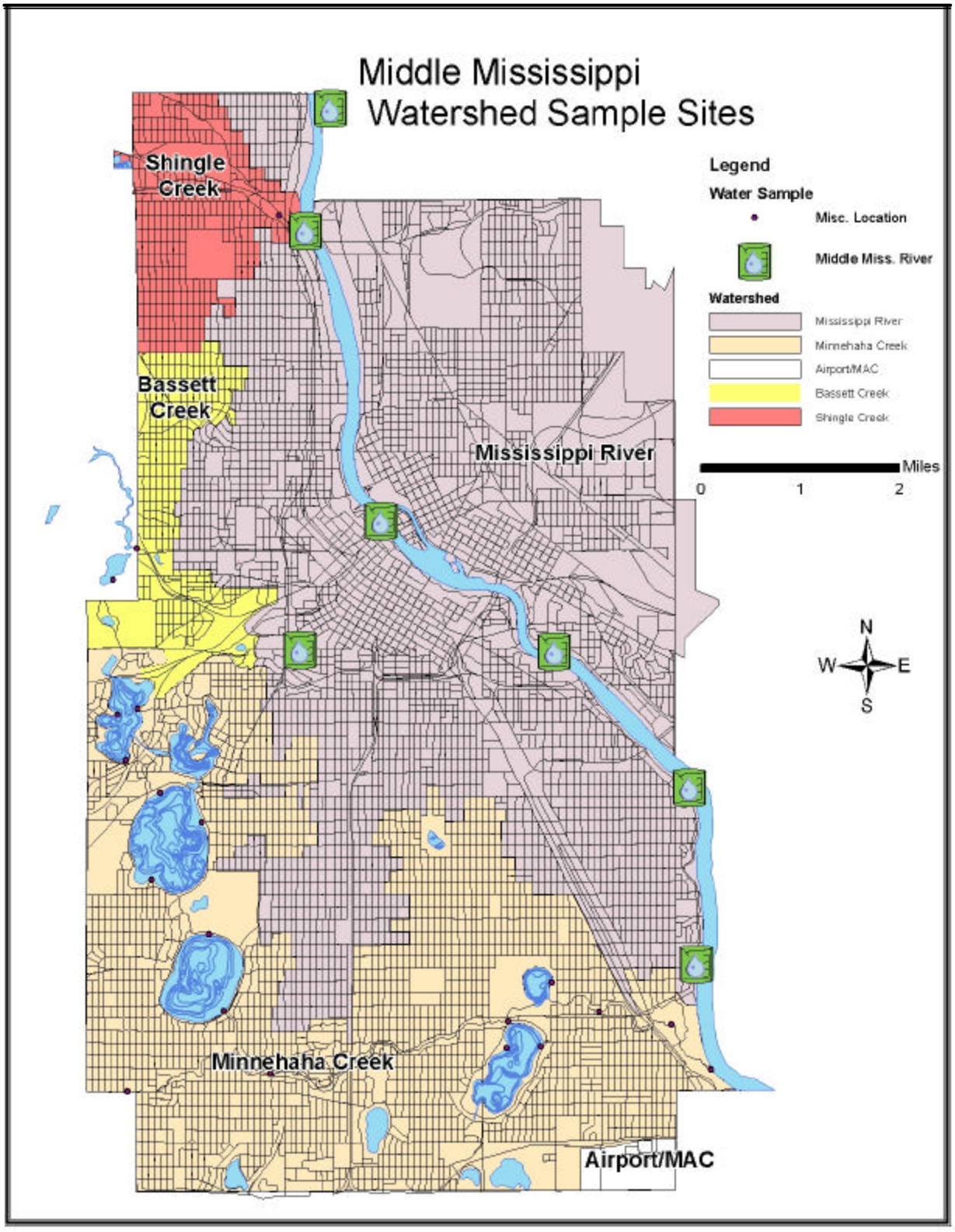
Cumulative Total	$36,573
Misc Costs - shipping, taxes, printing costs	$1,427
Requested Funding*	$38,000

*All costs will be accounted for in a year end budget report to the watershed.
*All unspent resources will be returned to watershed.

1. Provide detailed cost estimates for all phases of the project including diagnostic, feasibility, design, implementation, monitoring that you requesting funds for.
2. Provide a summary of matching dollars from all other sources including other grant sources. Including in-kind time, materials, equipment, and a description of the use limitations of the other fund sources, if any.
3. Indicate the year funds will be expended if different than the fiscal year that you are applying in (e.g. a multiple year levy for a project built in the second or third year of funding).
4. If equipment will be purchased with the requested funds, then provide the procurement process used and the cost breakout of each item.

Site and Construction Information

The accompanying map indicates where the sampling sites are located, 6 on the Mississippi River and 1 at Loring Park Pond. Sites will be marked using the GPS



Garmin® GPS 12

Both units feature the PhaseTrac12™ 12 parallel channel receiver for fast position fixes in tough conditions including tree canopy and urban obstructions. 500 user waypoints with alphanumeric name and user comment; TracBack™ navigation feature; over 1,000 track log points; position averaging; emergency erase and cloning features; latitude/longitude, user-programmable map datum and UTM grid format for advanced navigating; 106 map datums; and 9 proximity waypoint alarms. Capable of receiving DGPS corrections. The 12XL features external antenna capability, internal beeper alarm, and includes a rugged, compact case and 4 AA batteries.

GPS 12	**$149.95**
12V DC Adapter	**$ 21.50**
AA cell - pack of 8	**$ 6.15**
The Ultimate GPS Case	**$ 14.95**
Total	**$192.55**