July 1, 2000
LCMR Final Work Program Update Report
ML 1997, Chap. 216, Section 15, Subdivision 9(h).

AUG 2 9 2000

JRV
DGF
SAT
YF X
SS

LCMR Final Work Plan Update
Trout Habitat Preservation Using Alternative Watershed Management Practices
Brown's Creek, Washington County

I. PROJECT TITLE

Trout Habitat Preservation Using Alternative Watershed Management Practices (**Trout Habitat Preservation Project**)

Project Manager: Tony DeMars

Affiliation: Brown's Creek Watershed District, Consultant
Emmons and Olivier Resources

Mailing Address: 3825 Lake Elmo Ave. No.
Lake Elmo, MN 55042

Telephone Number: 651-770-8448
E-Mail: demars@eor.cnchost.com
Fax: 651-770-2552

Project Completion Date: ~~December 31, 1999~~ June 30, 2001

LCMR Work Program Year: 1997

Total Biennial Project Budget:

$ LCMR:	$250,000
Amount Spent:	$250,000
= LCMR Balance:	$0

Legal Citation: ML 1997, Chap. 216, Section 15, Subdivision 9(h).

Appropriation Language: This appropriation is from the future resources fund to the Board of Water and Soil Resources to implement alternative watershed management practices to preserve the lower reaches of Browns Creek as trout habitat.

II. PROJECT SUMMARY AND RESULTS

The objective of the Trout Habitat Preservation Project is to protect the lower reaches of Browns Creek, a DNR Designated Trout Stream. The key to sustaining the Brown's Creek trout fisheries is control of thermal, hydrologic (e.g., streamflow rate and volume) and water quality impacts of urban development. Brown's Creek is unique in that the trout fisheries occurs in the lower one mile of the stream, making it particularly sensitive to activities in the headwaters of the watershed. It is therefore necessary to focus trout habitat protection efforts in the headwaters of Brown's Creek so that the thermal, hydrologic and water quality conditions remain favorable to the trout fisheries. **The challenge, which faces the Brown's Creek Watershed District, is to resolve high-water conditions in the headwaters, while protecting the trout fisheries of the lower reaches.** The Trout Habitat Preservation Project effectively meets this challenge.

The cornerstone of the Trout Habitat Preservation Project will be to create a system of interconnected wetlands, infiltration ponds and vegetated overflow swales. This system will be constructed with the natural landscape elements in mind and will be designed to:

- **Minimize thermal impacts**
- **Maintain existing hydrologic conditions**
- **Protect water quality**

Because trout are very sensitive to small changes in these parameters, **traditional engineering approaches to watershed management would likely destroy the Brown's Creek trout fishery.** The traditional approach to watershed management generally involves construction of pipes and outlets to convey high-temperature, low quality water as quickly as possible to improve drainage. Several local examples of traditional engineering approaches include:

- **School Section Lake-Goggins Lake Outlet Study.** The study recommended construction of an outlet directly from Goggins Lake to Brown's Creek through a combination of pipe and open ditch.
- **City of Stillwater, Mckusick Lake Diversion.** The project would involve diverting water from the Brown's Creek watershed (Long Lake drainage area) to McKusick Lake and then the St. Croix River via Mulberry Ravine.
- **South Washington Watershed Central Draw Outlet.** Project would include construction of a large pipe to convey stormwater directly to Mississippi River.

All of the traditional engineering approaches listed above, emphasize moving water downstream rather than reducing stormwater runoff volume at the source. The Trout Habitat Preservation Project, will in particular, emphasize infiltration of rainfall runoff. Under natural conditions, many sites are capable of infiltrating large quantities of rainfall. However, as land is converted to agricultural or urban land uses, the infiltration capacity is significantly reduced or even eliminated. **The Trout Habitat Preservation Project will identify areas with high potential infiltration capabilities and restore and/or enhance them to maximize infiltration.** Water that is infiltrated eventually enters Brown's Creek as cool groundwater at a controlled rate, thus, helping to sustain the habitat requirements of the trout. **It is expected that the alternative watershed management techniques employed as part of this project will set a precedent for trout stream watershed management** in the Brown's Creek Watershed and elsewhere in Minnesota. Ongoing monitoring of these alternatives will provide valuable information on development of future projects to protect Brown's Creek and other Minnesota trout streams. **(Note that a more detailed background on this project is provided on page 18, Appendix B previously submitted).**

III. PROGRESS SUMMARY

The following summarizes the status of the project. The outline of project results has been updated to reflect to-date accomplishments and adjustments in budgets. The project involves the use of four different sources of funding: LCMR ($250,000), BWSR ($155,158), DNR (17,500) and BCWD ($115,942). The allocation of these funding sources to specific project task is shown in Table 1 of this LCMR Work Plan Update.

Project Budget and Scope Issues

Project Budget: The THPP has grown considerably in scope and budget in response to a variety of factors. Perhaps the most significant of these factors has been the ongoing goal of further mitigating impacts to the sensitive natural resources of Brown's Creek. Early on in the concept stage of the THPP, it was determined that creation of wetlands would strongly compliment the use of infiltration practices. Wetlands provide a buffer against peak flows from a 500-acre drainage while providing for significant removal of sediment, fertilizers and other materials generated from a largely agricultural landscape. The wetlands will also serve as a physical link between Goggins/School Section Lake and the extensive wetlands that serve as the headwaters to Brown's Creek. The BCWD, recognizing the additional cost wetlands would add to the THPP, sought additional funding through the BWSR Wetland Road Replacement Program in an amount of $155,158.00. The BCWD has recently received verbal approval of the funding source for the THPP.

The final construction cost estimate is $379,190.00. This includes the cost for placement of an 18-inch outlet pipe, construction of six acres of new wetland and construction of a three celled infiltration system. The work will involve excavation and disposal of nearly 78,000 cubic yards of soil to create the wetland/infiltration/drainage way system. The cost also includes establishment of native vegetation and erosion and sedimentation control for the entire project area. Cost for purchase of land or easements are not included in this cost. No changes are proposed in the LCMR budget to cover construction cost. The LCMR contribution toward construction cost will remain at $154,158.00. A plan view map breaks out the location of project work by funding source with color-coding. This map has previously been provided and is not included here. Additional detail on the project budget, including sources of other funding, is provided in the attached budget tables at the end of this report.

The construction bid came in at $289,074.47. Following release of the retainage, the final construction cost is expected to be $272,245.27. No major changes took place during the construction phase. As built drawings and a discussion of the minor changes can be found in the attached Final Report. The LCMR contribution to construction remains at $154,158. Two invoices have previously been submitted and paid. An invoice for the remaining $37,254.88 has been submitted and expected to be dispersed following receipt of this final work program update.

Property acquisition has been a very difficult task for the Watershed District. The final cost of this task has not yet been determined. The Watershed District purchased a 20 acre parcel in the location of the infiltration basins. The property was used as a fill-site for much of the material produced on site. The District intends to sell the property following construction. The cost of owning the property for the short period of time will not be known until after it is sold. The district is also uncertain as to the cost of acquiring the easement across the property where the wetlands were created. The district is currently in a condemnation process with the landowner to determine the final cost of the easement.

Burn Pit Remediation: Another factor responsible for increases in the scope and budget of the THPP is the discovery of approximately 5000 yds^3 of ash from a seven-year old tree burning operation. After further investigation and discussions with the MPCA, it was determined that no permits for this operation existed and that little was known about the exact content of the material in the burn pit. The BCWD, therefore, completed detailed chemical analysis of the burn pit material and the groundwater below it. Because the burn pit would potentially be used for infiltration, testing protocols included testing techniques designed to simulate large volumes of water being infiltrated. Results of testing indicate that the material contains low levels of polyaromatic hydrocarbons (PAHs). PAHs, which occur naturally within the environment at low levels, only present significant health risk if very large volumes of water are leached through the soil. For

this reason, a remediation plan was developed by the BCWD, and approved by the MPCA, to remove the burn pit material which consist largely of ash, unburned wood and sand and thin-spread on either agricultural or a nearby residential development. The burn pit material has a high nutrient value and can be used in place of lime on low p_H soils. Development of a remediation plan has added significantly to the cost of the THPP EAW. Implementing the remediation plan is estimated to cost an additional $45,000.00 to $65,000.00. Under a worst case scenario, landfilling the ash material would cost approximately $100,000.00.

During mid-fall of 1999, the BCWD put remediation of the burn pit out for bid. As part of this process, a prebid meeting was held to give potential contractors a first-hand view of the site. During this meeting, the BCWD hired a backhoe to excavate a test pit into the ash material to allow for additional inspection. In spite of advertising the work though normal channels, only two bids came in: one for approximately $42,000.00, the other for approximately $150,000.00. –

There was some concern that the lower of the two bids was due to the contractor misunderstanding the terms of the contract. The contractor for the higher bid indicated that no disposal site was located: therefore the bid assumed that the ash material would need to be land filled.

In addition to cost issues for removal of the burn pit material, various agency personnel as well as the Brown's Creek Watershed expressed concerns that the true composition of the burn pit material would only be known when the material is excavated. It was: therefore, the consensus of the Board that the burn pit not only could be too costly to clean up, but could carry unforeseen liabilities. A decision was then reached by the Board to withdraw the burn pit from the project.

An alternative infiltration area was located several hundred feet to the north of the burn pit on the Lueck Property. This alternative site is within the original project area, on the Lueck Property. The BCWD will purchase the entire 20-acre Lueck parcel, excavate a three-celled infiltration system and use the remaining portion of the property to dispose of the excavated material. Following project construction, the infiltration system and adjacent buffers will be placed within a conservation easement and the property resold.

Soil borings of the new infiltration area indicate that infiltration rates will equal approximately 1/3 those of the original project. As the project is constructed, the BCWD anticipates incorporating additional infiltration techniques into the project to provide additional infiltration. In addition, should the burn pit or other sites become available at a future time, these areas may be added to provide increased infiltration if necessary.

Wetland Issues: Wetland issues are an additional factor responsible for expanded project scope and budget. The primary wetland-related issue has been impacts to fringe wetlands on the Goggins/School Section Basin that might be impacted by lower lake levels. The Wetland Conservation Act and Section 404 of the Clean Water Act, may require replacement of wetlands lost due to lowering of lake levels. The question, which needed to be addressed, was whether high lake levels since the mid-1980's has resulted in formation of hydric soils. If hydric soil formation had occurred, the project might then require replacement of wetlands lost. To address this issue, the BCWD, in cooperation with the BWSR and the Washington County SWCD convened a Wetland Technical Evaluation Panel (TEP) to investigate soils, historical records on lake levels and preconstruction topography for the historical outlet. This investigation showed that prior to construction of the Wisconsin-Central Rail and County Road 7, a narrow channel extended though the area and would have allowed the Basin to outlet once a lake elevation of about 970.5 feet is reached. Preliminary soils analyses show no hydric soils development within impacted fringe areas of the lake.

A wetland technical evaluation panel (TEP) was convened to review wetland delineations and wetland creation plans for the project. The TEP consisted of representatives from BWSR, Washington County SWCD, the Anoka County SWCD, Natural Resource Conservation Service (NRCS) and the US Fish and Wildlife Service (USFWS). The TEP concurred with all wetland delineations and wetland creation plans for the project and has approved the BWSR Wetland Banking Plan Application.

Public Involvement: Finally, the public-relations element of this project has required considerable effort in the form of meetings with neighborhood groups, individual landowners, agency staff and the BCWD Managers and professional staff. Much of this effort has been included in cost for the EAW Response to Comments.

On June 28th, 1999 the BCWD Board formally ordered the Trout Habitat Preservation Project. During this meeting a public hearing was held and additional public comment taken. The Board also selected Alternative 1 during this meeting. Alternative 1 was chosen as the preferred alternative because it is the best from an engineering perspective, has the lowest potential maintenance, provides greater natural resource protection and is the lowest cost alternative. The following is a brief overview of some of the major changes and issues related to each Result of the project Workplan. These changes are also shown in the Workplan.

Result 1. Identification of Optimal Wetland Infiltration System

All Tasks associated with Result 1 are incorporated into the Trout Habitat Preservation Project Feasibility Report (Copy Attached). This report includes a summary of data collection and analysis, physical and biological conditions, hydrologic/hydraulic modeling, recommendations on alternatives and an analysis of potential environmental impacts. The Feasibility Study also examines cost and financing issues as well as laying out the remaining project schedule. Result 1 Tasks were completed within budget with the exception of additional soil borings and hydraulic conductivity analysis required for the proposed infiltration basin. The total increase in Result 1 budget is $3,342.00.

Result 2. Project Planning

Result 2 Tasks are ~~approximately 90%~~ complete with key accomplishments including completion of a Final EAW, EAW Response to Comments, ~~Draft~~ Draft and final Plans and Specifications, property easement acquisition (although final settlement has not been reached, easements were obtained) ~~descriptions, two of three property appraisals and discussions with property owners~~. Following is a brief overview of the status of each Result under Task 2 of the project update. Table 1 summarizes all project tasks including a revised schedule and budget.

Result 2.1 A Final EAW was submitted for review on February 18, 1999 and a Response to Comments and Record of Decision submitted on May 14th, 1999. The environmental review process uncovered a number of previously unanticipated issues including a 150-animal unit feedlot, fringe wetlands associated with the Goggins/School Section Basin and a seven-year old open burning pit used for the disposal of tree material. In addition, public comments required considerable additional analysis and response in the Response to Comments document. Result 2.1 has clearly generated the greatest level of uncertainty since the level of detail necessary to identify and resolve issues is unknown until actual submittal of the EAW. The total cost to complete the EAW was $40,842.00 or $14,459.00 more than in the amended work plan. These additional costs are being covered by DNR FDR Grants and BCWD levies.

Result 2.2 Draft Construction Plans and specifications were ~~was~~ completed in May of 1999. The original workplan called for only one alternative to be evaluated in the EAW; however, due to significant concerns voiced by landowners and the discovery of the Burn Pit, two alternatives were evaluated as part of the EAW. Keeping two alternatives open resulted in some additional design cost, increasing the cost of this result from $7,000.00 to $8,710.00.

Result 2.3 The primary permitting issues are impacts to fringe wetlands within the Goggins/School Section Basin and wetlands associated with BWSR Wetland Road Replacement areas. Other permitting issues include USCOE, Northern Natural Gas, and Wisconsin Central RR. During the past several weeks, the Washington County Wetland Technical Evaluation Panel has determined that WCA Exemption 5c applies to the fringe wetlands associated with the Goggins/School Section Basin. This exemption enables the project to be constructed without mitigation for wetland impacts (which do not appear to be significant). At this time, permitting is approximately 70% complete. Total expenditures for this work is currently at $5,935.00, or $935.00 in excess of the original budget. The budget for permitting has been adjusted to $8,000.00 to cover additional work anticipated completing the project. The LCMR budget, however, will be held to the present expenditures, or $4,785.00.

[1] ***Note that wetland banking funds are not being used to pay for portions of the project covered by LCMR funding***

Result 2.4 Negotiate Easements and Land Cost: Preliminary appraisals have been completed for two of three parcels within the project area. One additional landowner has requested compensation for an easement; however, the BCWD is still making a determination as to whether an easement is required. Only one of the four properties has a willing landowner. For this reason, considerable effort has been expended to reach consensus on easement terms. ~~Although the total actual cost to negotiate and purchase easements is unknown at the time of this reporting, it appears that the most recent estimate of $81,000.00 is still a viable assumption.~~ Final costs of acquiring property easements will not be known until after the purchased property is sold and after conclusion of the condemnation process.

Result 2.5 Final Construction Plans: Cost estimates for final construction plans were originally $8,000.00. This estimate was based on a total project cost of about $250,000.00. The alternative selected by the BCWD (Alternative 1) is estimated to have a total cost of $504,077. These cost are shown in Table VIII-1 of the THPP Feasibility Report. Based on the Feasibility Study cost estimates for Result 2.5 are $28,000.00. In addition to these costs, some additional funds are also available from the BWSR to design plans and specs for the watershed down stream of the In addition to final design and completion of plans and specifications this cost also includes wetland design and construction staking. ~~At the time of this reporting, construction design and surveying are approximately 95% complete.~~ Final plans and specifications were complete in 11-1999

Result 3 – Project Construction

Task 3.3 has been removed from Result 3. This task is for remediation of the burn pit and includes technical oversight as well as cost to develop plans and specifications, bidding documents and supervision of the burn pit material removal. **The BCWD has determined that the burn pit will not be used for an infiltration basin; rather, a new site on the Lueck Property will be used instead.**

The Feasibility Study identified two primary alternatives: Alternative 1 which would utilize a mostly above ground alignment and Alternative 2, which would bypass a landowner unwilling to negotiate with the BCWD. The BCWD has determined that Alternative 1 is the most technically sound, has the lowest, long-term maintenance cost, provides the highest level of protection to Brown's Creek and has the lowest total construction cost. On June 28th, 1999, the BCWD Board chose Alternative 1 and formally ordered construction of the THPP. Based on cost estimates provided in the Feasibility report and budget adjustments described herein, the total cost to complete Result 3 is ~~$294,415.00~~ **$379.192.**

Result 3.1Advertise and Solicit Bids Final plans and specification were completed in November 1999 and were advertised for bid in accordance with Minnesota law. 13 contractors provided bids for construction of the project. Prices varied considerably, but several bids were at or below the engineer's estimate.

Result 3.2 Award Contract Richard Knutson Inc. was the low bidder for the project with a bid of $289,074.47. The contract was awarded in December 1999.

Task 3,3 Construct Project Project construction began in January 2000 and was completed in April 2000. A description of project construction can be found in the Final Report.

Task 3,4 Inspect and Certify construction. EOR staff provided inspection services throughout construction, verifying construction practices, elevations etc. An asbuilt survey was performed following construction and is included in the Final Report. A Notice of Acceptability of Work is provided as certification of the construction.

Task 3.5 Monitor and Report Results The task was previously planned for the first six months following construction but due to circumstances the monitoring period has been delayed and extended. The outlet valve has not yet been opened (as of June 30,2000). The valve remained closed to allow the basins to become vegetated, thus preventing the loss of seed and minimizing the threat of erosion within the basins. An Operation, Monitoring and Maintenance Plan is currently being developed which details the

monitoring program through 2002. (copy of draft plan is included) Once the plan is finalized, it will be submitted and monitoring reports will be submitted in accordance with the plan, likely at the end of each monitoring season.

Table 1 provides a breakdown of how funding sources will be allocated to the project. Note that LCMR dollars will be allocated to construction of the outlet pipe system and infiltration basins while BWSR Wetland dollars will be allocated to design, construction and purchase of easements. A plan view of the entire project shows where LCMR and BWSR dollars will be allocated according to color-coding. This map has previously been submitted and is not included here.

IV. OUTLINE OF PROJECT RESULTS

This outline of project results provides an overview of the project workplan. **A more detailed work plan starts on page 11, Appendix A of this report.**

Result 1: Identification of Optimal Wetland/Infiltration System

All existing data along with soil borings, results of infiltration testing, and other subsurface data will be analyzed to determine the optimal wetland/infiltration system. Our assessment will evaluate the feasibility of different approaches using environmental criteria, cost-benefit analysis and overall effectiveness of the wetland/infiltration system in controlling thermal, hydrologic and water quality impacts to the trout fisheries. **Figure 1** shows a concept plan for the wetland/infiltration system. Result 1 includes the following task.

Task 1. Data Collection and Testing
Task 2. Analysis of Topography and Subsurface Data
Task 3. Develop Wetland/Infiltration Design Alternatives and Costs
Task 4. Review Design Alternatives for Potential Environmental Impacts
Task 5. Hold Public/Agency Meetings to Present Design Alternatives
Task 6. Select Final Design and Generate Final Report
Task 7.Meetings With Agencies and LCMR Staff to Present Concept Plan and Refine Work Plan, Budget and Scope as Needed

Deliverables

- *Organized file of all relevant information and field tests obtained for the study.* **Completed 9-15-98 (see Feasibility Study)**
- *A chapter in project report stating main assumptions, methodology and conclusions of the analysis. Appendixes containing subsurface water modeling assumptions and results.* **Completed 9-15-98 (see Feasibility Study)**
- *A chapter and appendices in the project report describing and evaluating design alternatives and associated costs.* **Completed 10-1-98 (see Feasibility Study)**
- *A chapter in the project report outlining environmental impacts and agency permitting requirements.* **Completed 10-1-98 (see Feasibility Study)**
- *Conduct two meetings including one public hearing and one joint agency meeting.* **Completed 11-30-98**
- *A summary chapter presenting final recommendations and rational.* **Completed 10-22-98 (see Feasibility Study)**
- *30 copies of the Wetland Infiltration Design Report* **Completed 10-22-98 (see Feasibility Study)**

Budget and Schedule

* Budget:	$40,479	Balance: 0
* Completion Date:	October 1, 1998	

Note: Budget increased by $3,342.00 to complete additional soil borings and hydraulic conductivity testing

Result 2. Project Planning

Project planning will focus on preparation of construction plans and specifications, permitting, easements, land acquisition and preparation of construction bidding documents. During this phase of the project, we will work closely with regulatory agencies, landowners and contractors to formulate a well-developed plan of action for project implementation. Based on agency feedback, an Environmental Assessment Worksheet (EAW) will be completed as part of this project. The EAW preparation and review will be incorporated into project planing. Project planning will include the following task:

Task 1. Complete Formal Environmental Review
Task 2. Develop Draft Construction Plans and Specifications
Task 3. Obtain Permits
Task 4. Negotiate Land Acquisition and/or Easements
Task 5. Develop Construction Plans, Specifications and Bidding Documents

Deliverables

- *Completed EAW Worksheet (50 copies for distribution).* **Final EAW completed 2-18-99, Response to Comments completed 5-15-99. Copies of THPP EAW and Response to Comments attached (Task 100% Complete)**
- *5 copies of draft plans & specifications.* **Completed 5-1-99**
- *Permits from all appropriate agencies and organizations.* **Permitting issues for portions of the project in the Goggins/School Section Basin are completed as of 7-1-99. Wetland delineation and permitting issues for the balance of the project are complete as of 11-1-99 ~~approximately (95 % Complete).~~**
- *Recorded easement and signed letters of authorization from appropriate landowners.* **~~Three appraisals are completed. Negotiations with land owners currently underway.~~ Easement acquisition complete 1-01-00. Final costs of easement acquisition yet to be resolved. The Watershed District purchased one parcel, received easement agreement on one parcel and is in condemnation on another.**
- *25 copies of the Final Plans and Specifications.* **Final Plans now expanded to include wetland construction. Plans and Specifications as of ~~11-12-99~~ 11-30-99 are ~~95%~~ complete.**

Budget and Schedule

* Budget: **$170,860** Balance:- **~~$80,174~~** **$0**
* Completion Date: ~~July 15, 1999~~ December 1999

Note: Budget increased by $42,477 to complete additional soil borings and lab analysis of soil and water associated with wood burning of ash on the site and cost for easements. Other additional cost resulting from increases scope of EAW and easement negotiations. Additional expenditures funded through combination of BCWD Levy, BWSR Grants for Road Replacement Wetlands and DNR FDR Funds. No LCMR funds are being used to cover these increases.

Result 3: Project Construction

Upon the completion of Result 2, the project will be advertised and bids solicited. State bidding procedures will be followed for public projects and it is anticipated that a pre-bid meeting will be held. Project construction is expected to take approximately 6 months to complete. Upon completion, the project will be inspected and certified. Monitoring will then be started with data collected on discharge from Goggins Lake, infiltration rates and volumes, discharge to Brown's Creek wetlands. The monitoring will be continuous at two locations and reported on a monthly basis for the first six months following project completion. The Tasks for Result 3, Project Construction include:

Task 1.	Advertise and Solicit Bids
Task 2.	Award Contract
~~**Task 3.**~~	~~Burn Pit Remediation~~
Task 4. ~~**3.**~~	Construct Project
Task 5. ~~**4.**~~	Inspect and Certify Construction
Task 6. ~~**5.**~~	Monitor and Report Results

Deliverables

- *Documentation of proper bidding notice and procedure, a summary of bidders, and bid tabulation sheets.* ~~**Approximately 75% Complete**~~ **Complete 12-99**
- *Executed construction contracts and Notice to Proceed.* ~~**Approximately 75% Complete**~~ **Complete 12-13-99**
- *Constructed Trout Habitat Preservation Project. Complete 4-01-00*
- *Final Report on the construction process summarizing change orders, actual costs, permit compliance, materials used and as-built grades. Complete 6-25-00 and included.*
- *Monthly reports on project monitoring. To be conducted July2000 through June2002 as outlined in OM&M plan*

Budget and Schedule

* Budget:	~~**($292,738)**~~ **$401,891**	Balance:	~~**($292,738)**~~ **($399,282)**

* Completion Date: July 1, 2000

Note! Construction budget increased by total of $109,154.00. No other changes made to Result 3. Project construction anticipated starting beginning in December, 1999. Construction and budget completion date is July 1, 2000. Monitoring period is extended through 2002

V. DISSEMINATION:

All work products identified above will be distributed to the Brown's Creek Watershed District Board, Legislative Commission on Minnesota Resources, Department of Natural Resources, Board of Water and Soil Resources, Minnesota Pollution Control Agency, Metropolitan Council, Brown's Creek Citizen and Technical Advisory Committees, Washington County Soil and Water Conservation District and the eight communities within the watershed. The distribution will be consistent with individual tasks identified above.

VI. CONTEXT:

A. Significance: Streams capable of supporting trout are rare in the seven-county Metro Region. According to the *Metro Region Trout Committee Report* (MN DNR, 1996), only six designated trout lakes and fourteen designated trout streams are found in the Metro Region, accounting for less than 1% of region's fishing water. It is therefore important that the last remaining trout waters be protected. The primary impact from urban development on trout resources is from increases in impervious surface area. Increases in impervious surfaces may result in degraded water quality, thermal impacts and increased runoff. In the Brown's Creek Watershed, an additional concern is high water conditions on several land-locked basins located in the headwaters of the Brown's Creek Watershed. The water surface elevations of these land-locked basins reflect local water table elevations, which have been at record highs in recent years. Most of these landlocked basins contain natural outlets that only function when lake levels reach an elevation exceeding the outlet elevation. Unfortunately, man-made alterations, such as roadways, have effectively blocked many of these natural outlets. There is need to restore these natural outlets without causing negative impacts to Brown's Creek. A more thorough discussion of the Brown's Creek Watershed and its trout fisheries is included in **Appendix B, page 18** of this report.

Traditional watershed management approaches have for many years stressed the use of series of pipes and ponds to convey stormwater runoff, provide flood storage and water quality treatment. While these stormwater management objectives are a high priority for the Brown's Creek Watershed, they must be accomplished through different approaches that also recognize the unique requirements of healthy trout streams. The Trout Habitat Preservation Project will use innovative techniques such as infiltration, use of natural and created wetlands and other infiltration management techniques. The results of this project will be used elsewhere in the watershed and throughout Minnesota to implement alternative watershed practices for trout stream preservation.

B. Time (Project Schedule): **Table 1** outlines the proposed schedule and budget for each result and task. The Brown's Creek Watershed District expects that project construction will be completed by July 1, 1999, however, due to an additional six month monitoring period and final reporting of results to the LCMR, a six-month extension for project completion is requested.

Table 1. Project Schedule and Budget

RESULT	TASK	TASK DESCRIPTION	START DATE	FINISH DATE	BUDGET
		Brown's Creek Hydraulic & Hydrologic Study	Jan. 1, 1998	Sept. 1, 1998	$64,523
		PROJECT FEASIBILITY STUDY			
Result 1.	1	Data Collection and Testing	July 20, 1998	Sept. 1, 1998	$23,055
	2	Analysis of Topography and Subsurface Data	July 20, 1998	Sept. 15, 1998	$2,740
	3	Develop Wetland/Infiltration Design Alternatives and Costs	Aug. 15, 1998	Sept. 15, 1998	$4,354
	4	Review Design Alternatives for Potential Environmental Impacts	Sept. 1, 1998	Oct. 1, 1998	$2,780
	5	Hold Public/Agency Meetings to Present Design Alternatives	Sept. 15, 1998	Oct. 1, 1998	$2,304
	6	Select Final Design and Generate Final Report	Sept. 15, 1998	Oct. 1, 1998	$3,199
	7	Meet with Stakeholders – Refine Work Plan	Sept. 15, 1998	Oct. 1, 1998	$2,047
				RESULT 1 SUBTOTAL	**$40,479**
		PROJECT PLANNING			
Result 2.	1	Complete Formal Environmental Review		6-1-99	$40,842
	2	Develop Draft Construction Plans and Specifications		~~5-1-99~~ **11-10-99**	$8,710
	3	Obtain Permits	~~Jan. 1, 1999~~	~~Sept. 1, 1999~~ **Dec. 2, 1999**	$9,000
	4	Obtain Easements and Negotiate Land Acquisition	~~Jan. 1, 1999~~	**Dec. 2, 1999**	$81,000
	5	Develop Construction Plans, Specifications and Bidding Documents	~~Feb. 1, 1999~~	~~August 15, 1999~~ Nov. 13, 1999	$31,308
				RESULT 2 SUBTOTAL	**~~$128,383~~ $170,860**
		PROJECT CONSTRUCTION			
Result 3.	1	Advertise and Solicit Bids	~~July 1, 1999~~	~~8-1-99~~ **Nov. 15, 1999**	$2,000
	2	Award Contract		~~9-1-99~~ **Nov. 29, 1999**	$1,000
	3	Burn Pit Remediation		~~10-1-99~~ **Nov. 12, 1999**	$4,700
	~~3~~ 4	Construct Project	**Dec. 10, 1999**	~~11-15-99~~ **June 30, 2000**	$379,191
	~~4~~ 5	Inspect and Certify Construction		~~11-15-99~~ **June 30, 2000**	$8,000
	~~5~~ 6	Monitor and Report Results		~~12-1-99~~ **June 30, 2001**	$7,000
				RESULT 3 SUBTOTAL	**$401,891**
				GRAND TOTAL	$677,753

C. Budget Context: Table 2 outlines sources of project funding.

Table 2. Budget Context

Funding Source	July 1997-Nov. 1, 1999 Total expenditures — (Thru ~~Oct. 1999~~June 2000)	Nov 1999-June 2000 Remaining expenditures	July 2000-June 2001 Anticipated future expenditures	Totals
LCMR	~~$95,843~~ $250,000	~~$154,157~~ $37,254.88	~~$155,244~~ $ 0	$250,000
FDR*	~~$38,361~~ $44,666	$ 0 ~~$2,834~~	$0 ~~$9,139~~	$47,500
BCWD**	~~$32,552~~ $180,572	~~$158,020~~$10,000	~~$73,058~~	$190,572
BWSR	~~0~~$155,158	$0 ~~$155,158~~	~~$155,158~~	$155,158
Totals	~~$117,271~~ $173,061		$383,912	$643,230

*FDR - DNR Flood Damage Reduction Grant **BCWD - Browns Creek Watershed District Levy

Dollar amounts are listed as "expended" even if the payments have not yet been received

VII. COOPERATION:

Table 3 summarizes major projects currently underway in the Brown's Creek Watershed. The Watershed is working to coordinate these and other smaller efforts to insure that all data and information is shared between different projects as efficiently as possible. The focus of the *Metropolitan Council Water Quality/Ground Water Monitoring* project is to gather detailed information on groundwater and water quality parameters within the lower mile of Brown's Creek. The project, *Preventing Storm Water Runoff – Watershed Land Use Design,* is an LCMR-funded study to determine alternative development approaches that preserve the hydrologic functions of the watershed. This study may eventually be used to develop "trout friendly" development blueprints for widespread use in the watershed. The *Brown's Creek Channel Relocation* project will target a reach of Brown's Creek that flows through the Oak Glen Golf Course. This reach will be restored to its original channel alignment and will reduce thermal impacts to Brown's Creek. The *Riparian Vegetation Plantings* will provide shady cover to an otherwise sunny, open reach of Brown's Creek. Finally, the *Brown's Creek Hydrology and Hydraulic Study* will provide information on stream flow rate, volume, timing and thermal impacts. This study will provide baseline information to tie together existing and future projects in the Brown's Creek Watershed. **Letters of Cooperation are attached for the *Water Quality/Groundwater Monitoring* and *Channel Relocation* projects starting on page 23, Appendix C of this report.**

Table 3. Cooperation
Summary of Brown's Creek Watershed Projects

Project	Funding Source	Cooperator(s)	Schedule Or Status	Total Dollars
Water Quality/ Groundwater Monitoring	Metropolitan Council – Water Quality Initiative	St. Croix Watershed Research Station	Completion Date – July, 1999	$80,000
Preventing Storm Water Runoff – Watershed Land Design	LCMR Grant	U of M Landscape Department	Completion July, 1999	$280,000
Brown's Creek Channel Relocation	Legislative Appropriation	MN DNR Fisheries	1998 –1999	$300,000
Riparian Vegetation Plantings	Trout Unlimited	Trout Unlimited, Oak Glen Golf Course	Completion, Summer of 1998	$5,000
Lower Brown's Creek Bank Stabilization	DNR Fisheries	MN DNR Fisheries	Completion, Summer of 1998	$2,000
Brown's Creek Hydrology & Hydraulic Study	Brown's Creek Watershed District/MN DNR FDR	DNR Fisheries, St. Croix Watershed Research Station	Completion, Sept. 1998	$58,866

VIII. LOCATION: See Attached Map previously submitted.

IX. REPORTING REQUIREMENTS:

The following reporting schedule is proposed. Reporting will be completed on a quarterly basis beginning on the January 1, 1999.

Reporting Schedule

- October 1, 1999
- January 1, 2000
- April 1, 2000
- July 1, 2000