

Date of Report: July 13, 1993

LCMR Work Program 1993

I. Project Title: IE 3-3 Environmental Education Outreach Program

Program Manager: Pauline Langsdorf
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A. Legal Citation: M.L. 93 Chpt. 172, Art. , Sect. 14, Subd. 7E

	<u>LCMR</u>	<u>Non-State Funds</u>
Total Biennial Budget:	\$215,000	\$215,000
Balance:		

Appropriation Language as drafted 7/27/92: Subd. 7 (e)
This appropriation is from the future resources fund to the commissioner of education for a contract with Metropolitan Waste Control Commission (MWCC) to develop a multi-disciplinary environmental science and math curriculum for grades K-12 and team-taught by private sector volunteers, teachers, and MWCC volunteer staff. A grant request to supplement this appropriation must be submitted to the U. S. Environmental Protection Agency and the results reported to the Legislative Commission on Minnesota Resources. This appropriation must be matched by an equal amount of non-state funds.

B. LMIC Compatible Data Language:

C. Status of Match Requirement: Equal amount of non-state funds.

Match required: \$215,000 (Equal amount of non-state funds.)
Funds Raised to Date: \$0

II. Narrative: The MWCC Environmental Education Outreach Program is a unique public/private partnership designed to utilize MWCC environmental projects as real-life examples of how mathematical and scientific principles are applied to solve real-life environmental problems. A list of trained volunteers from the engineering and science professional community, set of lesson plans, curriculum materials, and equipment will be developed and maintained in a Resource Library so that teachers may select a lesson plan with appropriate support materials and a volunteer who will assist the teacher in the classroom with the actual lesson presentation. The program is designed to reinforce basic

principles taught in the classroom, provide real-life hands-on examples, enable students to identify with role models from the environmental professions, and promote student enthusiasm for the environmental professions. From August 1990 to March 1992, MWCC expended \$138,000 evaluating existing supplemental educational programs within the metropolitan school districts, conducting workshops, seminars, and personal interviews with local teachers, curriculum coordinators, administrators, educational consultants, and community leaders, and evaluated public and private outreach education programs across the United States in an effort to develop the MWCC Environmental Education Outreach Program which is detailed in the MWCC Educational Outreach Program Report, (March 1992).

This LCMR appropriation, along with non-state and private sector matching funds, will be used to initiate and fully implement the program.

III. Statement of Objectives: The general objective of this project is to increase the number of students enrolled in mathematical and science courses by creating a unique public/private partnership which utilizes real-life environmental projects from MWCC to illustrate the application of mathematical and scientific principles in solving environmental problems and thereby increase the number of individuals entering the environmental professions. To accomplish the above general objective, the following specific objectives will be achieved:

- A. Obtain the human resources necessary to fully implement the program.
- B. Develop and obtain the curriculum and physical resources necessary to fully implement the program.
- C. Implement the Environmental Education Outreach Program in the Minneapolis and St. Paul school districts.

IV. Objectives

- A. Title of Objective: Obtain the human resources necessary to fully implement the program.
 - A.1. Narrative: The purpose of this objective is to obtain the program coordinator, the secretary/librarian, the curriculum writers, and the volunteers necessary to fully implement the program.
 - A.2. Procedures: The paid staff (i.e., coordinator and secretary/librarian) will be recruited both from within

and outside the MWCC using the MWCC's standard employment practices. Curriculum writers will be selected by the Program Coordinator from the local educational community and will be retained on either a volunteer or consultant basis. Volunteers will be obtained through recruiting qualified professionals from the MWCC staff, engineers and scientists from the local professional community, and community service organizations. To accomplish this objective, the following activities will be completed:

- a.2.1. Select and hire the program coordinator and secretary/librarian when funds become available. Qualifications for these positions are contained at the end of this report under section VII.D.
- a.2.2. Obtain services of curriculum writers. The program coordinator will hire curriculum writers on an as needed basis from July 1993 through August 1994.
- a.2.3. Identify and develop volunteer pool through recruiting qualified professionals from the MWCC staff, engineers and scientists from MWCC staff, engineers and scientists from the local professional community, and community service organizations. Volunteer recruitment will begin as soon as funding is received and continue throughout the length of the project.
- a.2.4. Train volunteers on Resource Library content and overall program goals, policies, and procedures.

A.3. Budget:

a. Amount budgeted:	<u>LCMR</u>	<u>Non-State Funds</u>
Staff salaries and benefits	\$148,000	\$95,000
Teacher training and recruitment	8,000	
b. Balance:		

A.4. Timeline:

Activity	7/93	1/94	6/94	1/95	6/95
a.2.1.-Coord/Sec/Lib.	XXXX				
a.2.2.-Writers	XXXXXXXX		XXXXX		
a.2.3.-Volunteers		XXXXX		XXX	
a.2.4.-Training	XXX		XXXX		

A.5. Status:

A.6. Benefits: Meeting this objective will provide overall program management and administration, a work force for preparation of the lesson plans, and a pool of trained volunteers capable of implementing the program in individual classrooms.

B. Title of Objective: Develop and obtain the curriculum and physical resources necessary to fully implement the program.

B.1. Narrative: The purpose of this objective is to identify the mathematical and scientific principles upon which lesson plans will be developed utilizing real-life MWCC projects and prepare the appropriate curriculum materials for delivery to the classroom. This objective will focus on developing lesson plans, preparing appropriate support materials, purchasing necessary equipment, and establishing the resource library.

B.2. Procedures: This objective will identify the lesson topics, prepare 40 lesson plans related to the selected topics utilizing real-life MWCC projects as examples, develop the appropriate curriculum materials, obtain the necessary equipment, and establish a resource library. The lesson plans, materials, and equipment will be housed in the Resource Library and made available to teachers and volunteers for presenting the lesson plans in the classroom. To achieve this objective, the following activities will be completed:

b.2.1. Identify and prioritize mathematical and scientific principles to use in lesson plan development. A team of experienced consultant teachers will meet with MWCC staff and MWCC consultants to determine which mathematical and scientific principles can best be taught using real-

application of science and math principles, thus, emphasizing to students the need for these skills.

VI. Context:

- A. Four recent state-sponsored studies have documented the need for Minnesota to dramatically improve its teaching of math and science. Minnesota companies currently hire more environmental engineers than are graduated from Minnesota colleges.
- B. These same studies indicate that business/school partnerships improve the quality of science and math education. This project has the potential to educate students on specific environmental issues while encouraging them to further their knowledge and interest in basic science and math.
- C. The MWCC has spent over \$138,000, and its consultant has voluntarily donated an additional \$60,000 in developing this program to enhance Minnesota's educational system to ensure an adequate supply of environmental professionals for Minnesota's future. This LCMR appropriation provides funding for the initial stages of program implementation, which is designed to have a far reaching effect on Minnesota's future. MWCC has conducted teacher workshops and seminars which have received outstanding reviews from educators. Research for this project included additional workshops, seminars, and interviews with university professors, school district consultants, classroom teachers, and students in order to produce a program designed with extensive teacher input. These workshops and interviews were necessary to determine educators' level of interest, potential commitment, and willingness to actively implement this program. Acceptance by professional educators is essential to get any program off the shelf and into the classroom. This program assists teachers in teaching basic math and science principles with lessons, loaned specialized equipment, and volunteer non-academic professionals.

VII. Qualifications:

- A. Program Manager - Pauline Langsdorf
Sr. Communications Specialist, MWCC
 - A.1. Developed and coordinated wastewater treatment teacher workshops. Oversaw the development of this Educational Outreach Program. Spearheaded MWCC participation with National Science Foundation grant program at the

University of Minnesota. Former board member of the Minnesota Environmental Education Council. Former board member for local League of Women Voters, chairing the environment committee. Chaired Environmental Advisory Commission to the Crystal City Council. Chosen by local newspaper as "Citizen of the Year" for commitment to environmental activities including environmental education. B.S. in Education from the University of Wisconsin, Madison; graduate work at St. Cloud in Education; and graduate work at Mankato in Public Administration.

- A.2. Sr. Communications Specialist with responsibility for project communications, educational outreach, and community relations.

B. Program Advisors

- B.1. Louis R. Clark, Chair MWCC; former Deputy Commissioner of Employee Relations for State of Minnesota; MA in Guidance, Counseling and Psychology, BS in Education, both from Western Michigan University.
- B.2. James H. Reynolds, Ph.D., P.E., Vice President, James M. Montgomery (JMM), Consulting Engineers, Inc.; B.S. Civil Engineering, M.S. Environmental Engineering, Ph.D. Environmental Engineering, Utah State University; Head, Division of Environmental Engineering, Utah State University; member of Utah State Chemistry and College of Engineering Advisory Boards; over 150 technical publications, including four books on Environmental Engineering. JMM's project manager for MWCC Environmental Education Outreach Program development.
- B.3. Marvin D. Williams, Director of Urban Strategy, James M. Montgomery, Consulting Engineers, Inc.; B.A. Wesleyan University; J.D. Yale Law School; High School History Teacher; Mayor's Advisory Committee, Washington D.C.; Director, Educational Outreach Program, Metropolitan Boston Transit Authority, Boston, Mass.
- B.4. Kenneth Jeddelloh, Secondary Science Coordinator Minneapolis Schools; Former President of the Minnesota State Science Teachers Association.
- B.5. Aletha Halcomb, Physics Teacher, North High Sumatech Program, Minneapolis Schools; Former President of the Minnesota State Science Teachers Association.

- B.6. Joseph Premo, Elementary Science Coordinator, Minneapolis Schools.
- B.7. Maureen Willard, Gifted and Talented Coordinator, St. Paul Public Schools.
- B.8. Millard Neymark, Science/Math, Murray Jr. High, St. Paul Public Schools.
- B.9. Charles Lund, Supervisor of Science and Math, St. Paul Public Schools.
- B.10. Dorothy Sarafolean, Science Specialist, Elementary, St. Paul Public Schools.
- B.11. Eugene Gennaro, Professor of Science Education, University of Minnesota.
- B.12. Gretchen Usher, High School Chemistry Teacher; former president of Twin Cities Chemistry Teachers Association; former board member of Minnesota State Science Teachers Association; board member of local chapter of American Chemical Society.

C. Cooperators/Other Investigators

C.1. The volunteers sought will be active in the environmental professions, generally degreed in areas of science and math, including MWCC's engineering consultants, MWCC staff, and non-agency experts in the areas of math, science, and environmental science, and professionals from the African-American community.

C.2. Volunteers will come from the following groups:
 Urban League
 University of Minnesota
 Minneapolis School System
 St. Paul School System
 100 Afro-American Men
 Consulting Engineering Firms
 MWCC Professionals

D. Program Coordinator - to be named

D.1. Qualifications to be considered in selecting a coordinator:

d.1.1. A strong interest in public information and education.

- d.1.2. An education background which qualifies this person to work with professional educators and technicians, including teaching experience.
- d.1.3. A demonstrated ability to work with political leaders. Acceptance by politicians and school systems will be an ongoing need.
- d.1.4. Knowledge of MWCC operations and policies or the ability to obtain it.
- d.1.5. Involvement with the educational establishment, either through teacher organizations for grades K-12 or the University of Minnesota.
- d.1.6. Experience working with local institutions involved with scientific education for young people, such as the Science Museum of Minnesota, etc.

E. Secretary/Librarian - to be named

E.1. Qualifications to be considered in selecting the secretary/librarian are:

- e.1.1. A strong interest in public information and education.
- e.1.2. Past involvement with the educational establishment in grades K-12.
- e.1.3. Good organizational skills.
- e.1.4. Typing skills.
- e.1.5. Library experience or experience in a related field.

VIII. Reporting Requirements

Semi-annual status reports will be submitted not later than January 1, 1994; July 1, 1994; January 1, 1995; and final status report by June 30, 1995.