MAITLAND VALLEY CONSERVATION AUTHORITY

CLEAN UP RURAL BEACHES PROGRAM

1993 ANNUAL REPORT

Prepared by: Anne Loeffler and Brent Robinson

Prepared for: Ontario Ministry of Environment and Energy

June 2, 1994

Wroxeter, Ontario

ACKNOWLEDGEMENTS

The Maitland Valley Conservation Authority CURB (Clean Up Rural Beaches) Program is funded by the Ontario Ministry of Environment and Energy as a component of the Provincial Rural Beaches Strategy and by the Maitland Valley Conservation Authority.

Thanks are extended to the following members of the MVCA local CURB committee for their co-operation and hard work:

Chris Hoskins	Maitland Valley Conservation Authority
Glen Warwick	Huron County Land Stewardship II Committee
Brent Kennedy	Ontario Ministry of Agriculture, Food and Rural Affairs
Rob Leach	Perth District Health Unit
Murray Blackie	Ontario Ministry of Environment and Energy

Water quality data for the public swimming beaches were supplied by the Huron County Health Unit.

Thanks to Dianne Dosman for assisting in the final preparation of this report.

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1.0 INTRODUCTION

1.1 Program Background

In 1989, the Maitland Valley Conservation Authority (MVCA) completed a Clean Up Rural Beaches (CURB) Plan for the Maitland watershed (Fuller and Foran, 1989). The CURB study was a response to public health concerns regarding elevated bacterial concentrations at swimming beaches along the Lake Huron shoreline. Funding for this study came from the Ontario Ministry of Environment and Energy (MOEE) under the Provincial Rural Beaches Strategy (PRBS).

The CURB Implementation Program is the second phase of the PRBS. Announced by the Ontario Ministry of Environment and Energy in August 1991, the CURB Program provides financial incentives to clean up sources of water pollution upstream of rural swimming beaches.

1993 was the third year of the CURB Implementation Program at the MVCA. The objective of this report is to provide a summary of the water quality improvement projects completed in the Maitland watershed and activities undertaken by MVCA CURB staff between April 1, 1993, and March 31, 1994.

1.2 CURB Target Watershed

The Maitland watershed is largely agricultural. Extensive cottage development occurs along 48 kilometres of Lake Huron shoreline. The total CURB target watershed area is 3,261 km^2. This area includes the watersheds of the Maitland, Nine Mile and Eighteen Mile Rivers as well as the lakeshore gullies. A watershed map of the MVCA's area of jurisdiction is shown in Figure 1.

It has been estimated that approximately 2,800 faulty septic systems in the watershed are polluting surface waters (Fuller and Foran, 1989). In addition, between 1,500 and 2,000 livestock operations may be sources of surface water contamination (Loeffler, 1992). Potential sources of bacterial contamination from livestock operations includes milkhouse washwater and manure stack runoff to surface waters and field tiles, tile contamination during manure spreading, spreading of manure in winter, and livestock access to watercourses.

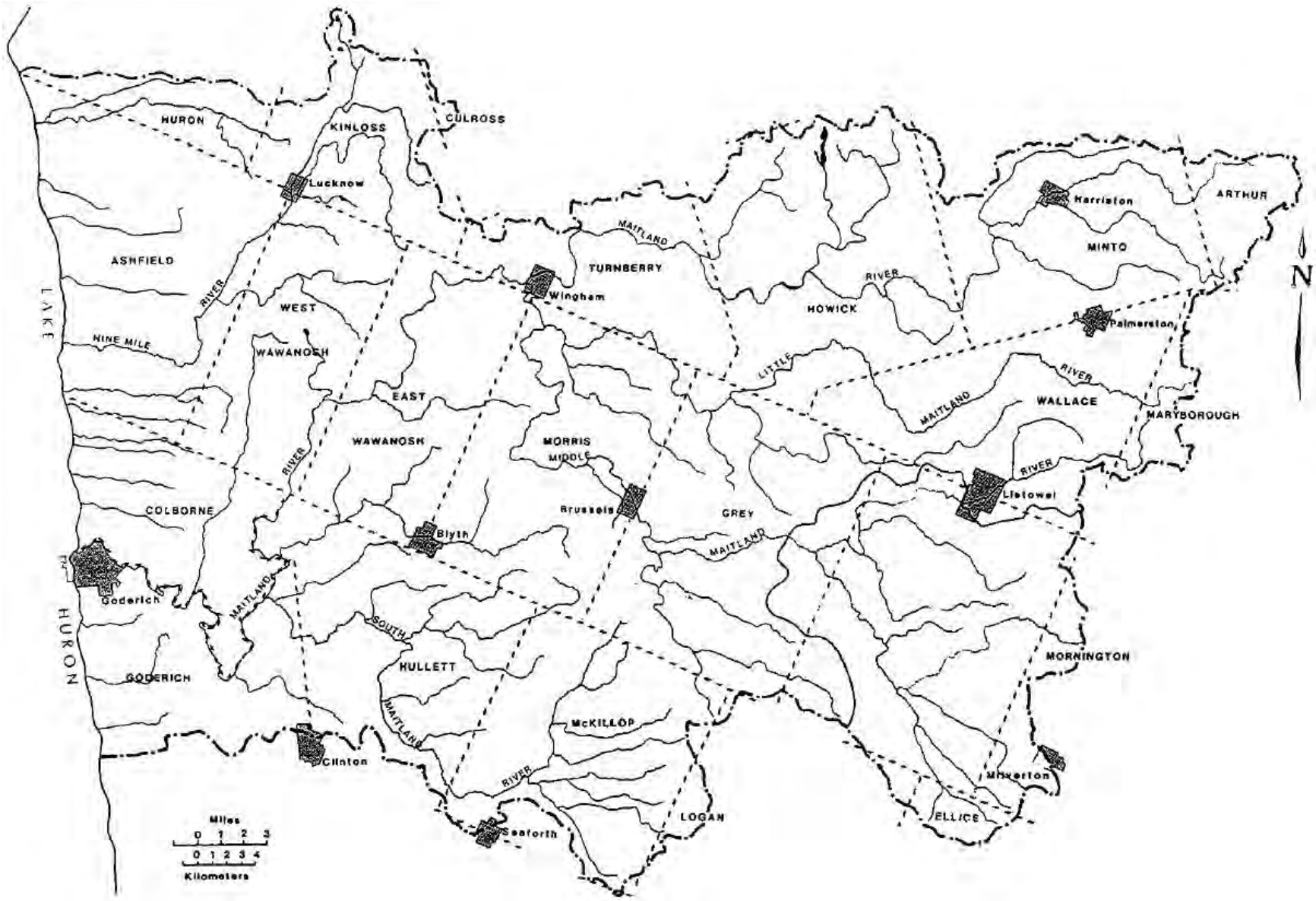

Figure 1: MVCA area of jurisdiction

2.0 CURB PROGRAM IMPLEMENTATION

2.1 Local CURB Committee

In 1993 the local committee consisted of the following members:

Chris Hoskins (chair)	Maitland Valley Conservation Authority
Murray Blackie	Ontario Ministry of Environment and Energy (SW Region)
Glen Warwick	Huron County Soil & Crop Improvement Association
Brent Kennedy	Ontario Ministry of Agriculture, Food and Rural Affairs
Rob Leach	Perth District Health Unit

The committee met every month except in November 1993 and February 1994 to review project proposals.

The MVCA CURB committee has recognized that project proposals located close to the beach should receive priority over proposals from areas a significant distance from the beach. Funding priority is given to those projects with the highest potential for water quality improvement.

2.2 CURB Program Applications

Landowners in the Maitland watershed have enthusiastically responded to the CURB program. To date, almost 1,000 enquiries regarding the program have reached the MVCA office. MVCA CURB staff conducted approximately 600 site visits and inspections of completed projects in 1993.

In the 1993 fiscal year, the Maitland CURB committee approved 236 project proposals for CURB grants. Table 1 shows the number of projects by program section. In total, $1,360,611 was allocated.

The committee turned down twenty-two project proposals in 1993. These proposals were turned down either because they did not meet program requirements or because they were considered a low priority in terms of improving water quality at shoreline swimming beaches. Two applicants appealed the committee's decision; both of these projects were consequently approved for funding. None of the applicants appealed a committee decision to the Science and Technology Branch, MOEE.

Table 1. Approved CURB Project Proposals in the 1993 Fiscal Year

	Number of Projects	Grants Allocated
Septic Systems	81	$136,888
Livestock Access	28	$106,765
Milkhouse Waste	29	$ 83,748
Manure Storages	98	$1,033,210
Total	**236**	**$1,360,611**

Table 2. CURB Projects Completed in the 1993 Fiscal Year

	Number of Projects	Grants Allocated
Septic Systems	72	$120,238
Livestock Access	24	$ 95,678
Milkhouse Waste	21	$ 56,498
Manure Storages	65	$691,035
Total	**182**	**$963,449**

2.3 CURB Projects Completed

In the 1993 fiscal year, 182 water quality improvement projects were completed in the Maitland watershed. This total includes ten projects previously reported in the 1992 annual report. Table 2 provides a summary of the grants paid, the average grant per project, and the number of projects completed by program section.

Seventy-two private septic systems were replaced in 1993. These septic systems were polluting open watercourses and tile drains by discharging sewage effluent or grey water.

Twenty-four fencing projects to restrict livestock from watercourses were completed in the watershed last year. In total, approximately 1,300 head of livestock were fenced from over fifteen kilometres of watercourse in 1993. These projects included nine stream crossings and eighteen alternate watering sites.

Projects to divert milkhouse washwater from surface water or subsurface tile drainage were completed on twenty-one farms this year. Ten operations are now storing milkhouse waters in concrete tanks. One farmer has incorporated milkhouse washwater into his solid roofed manure storage. The remaining ten farmers received grants for installing treatment trench systems.

Sixty-five manure management projects were completed in 1993. Grant approvals were issued either to prevent runoff to watercourses and field tiles, or to eliminate the need for spreading manure in the winter. The projects included thirty-two liquid manure or runoff tanks (including combined milkhouse waste/manure tanks), twenty-eight roofed solid manure storages, one earthen lagoon, one semi-solid storage, and three clean water diversion projects.

The distribution of the number of projects completed by program section is shown in Figure 2. Figure 3 shows the distribution of the grant dollars by program section.

The MVCA issued $962,757.98 to landowners for CURB projects completed in the 1993 fiscal year. Table 3 shows the breakdown of grants paid and average grant by program component.

2.4 Unfinished Projects

Fifty-four projects which were approved for CURB grants in 1993 were not completed by March 31, 1994. Twenty-six of these applicants have re-applied for funding in the 1994 fiscal year.

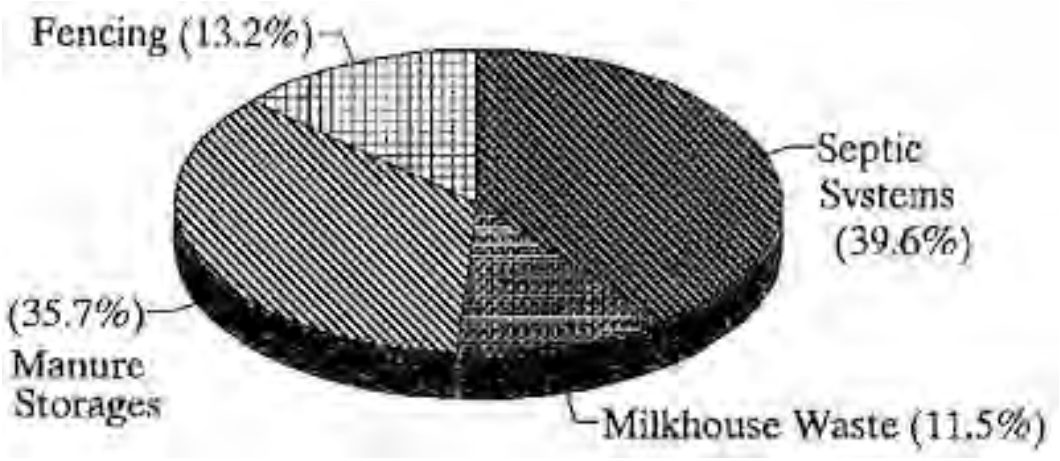

Figure 2: Distribution of Completed CURB: Projects by Program Section

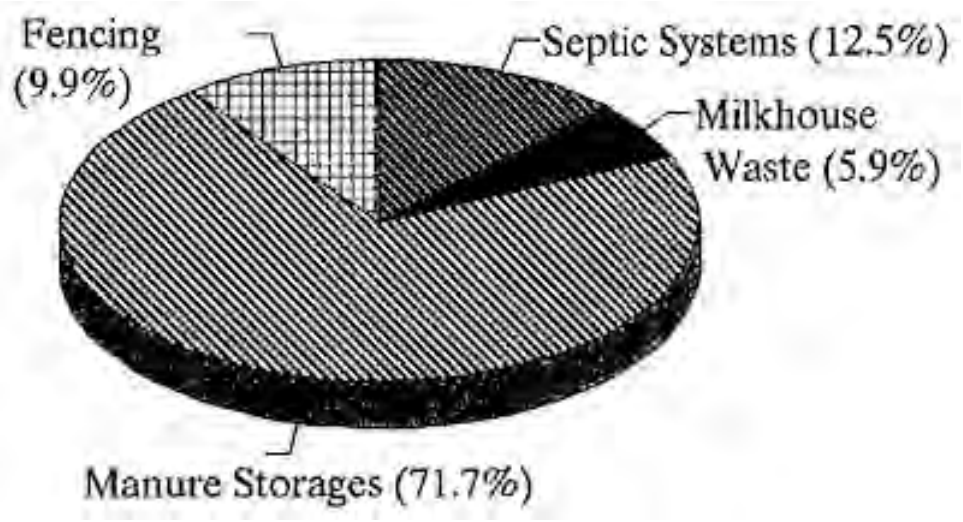

Figure 3: Distribution of Grant Dollars: by Program Section

Table 3. Grant Cheques Issued by the Maitland Valley Conservation Authority for CURB Projects Completed in the 1993 Fiscal Year

	Number of Projects	Total Grants	Average Grant
Septic Systems	72	$120,238.20	$ 1,669.98
Livestock Access	24	$ 95,677.61	$ 3,986.57
Milkhouse Waste	21	$ 56,498.31	$ 2,690.40
Manure Storages	65	$690,343.86	$10,620.67
Total	**182**	**$962,757.98**	

2.5 Total Projects Completed (1991 to 1993)

Since the start of the CURB program in September 1991, 385 water quality improvement projects have been completed in the MVCA watershed. The total capital costs of these projects is approximately $ 5 million. Grant cheques totalling $1,933,247.07 have been issued in the first three years of the program.

3.0 INFORMATION AND EDUCATION ACTIVITIES

In the summer of 1993, information and education activities were largely directed towards the shoreline area. Lakeshore property owners received a fact sheet on septic systems and CURB program information. Staff also distributed posters to shoreline areas to promote awareness of septic system issues. Promotional flyers were mailed to all farms in the Goderich, Colborne and Ashfield Townships in June.

Five press releases promoting various aspects of rural waste management and the CURB program were distributed to the local media in 1993. In addition, advertisements for the CURB program were run in all local newspapers. Copies of various materials used in information and education activities are located in Appendix A.

MVCA CURB staff gave two TV interviews with CKNX TV on water quality problems and CURB grants. In addition, one radio interview was conducted with CKNX radio.

At the International Plowing Match in Walkerton last September, the CURB staff from Maitland Valley, Saugeen Valley and Grey-Sauble Conservation Authorities set up a joint CURB display.

Presentations on the CURB Program were given to MVCA directors, a cottage association, several fencing sales meetings, the Huron County Beef Producers, and various local groups.

4.0 WATER QUALITY DATA

4.1 PUBLIC SWIMMING BEACHES

Bacterial concentrations in water samples collected by the Huron County Health Unit at Lake Huron beaches and inland swimming areas are shown in Table 4 (Huron County Health Unit). The Health Unit reported that although no beaches were closed in 1993, all swimming beaches in the Maitland watershed were posted with advisory signs. These signs warned swimmers that high bacterial counts could be expected two to three days after a heavy rain.

All Lakeshore beaches yielded samples exceeding the MOEE recreational water quality objective of 100 *E. coli*/100 ml of water on at least one occasion. The worst problems were evident at Camp Mackenzie, Kitchigami Camp Road and Bogie's Beach, where 100%, 100% and 60% respectively of samples failed to meet the MOEE objective. However, the data from these three beaches may not provide a fair comparison to the other beaches since six or fewer samples were taken at these three beaches.

Among the inland beaches, Bluevale Dam was the only reservoir where bacteria counts stayed below the MOEE objective all summer.

In 1993, 42% (62 of 146) of the samples taken by the Health Unit at swimming beaches exceeded the MOEE objective. This is a slight improvement over 1992, where 48% (92 of 193) of the samples exceeded the objective.

4.2 MVCA WATER SAMPLING PROGRAM

4.2.1 Introduction

Seventeen sites were sampled this year by MVCA CURB staff. Upstream and downstream sites were sampled on four farms which had been approved for CURB grants. In addition, two contaminated tile outlets and one downstream station were sampled. The remaining samples were taken on major tributaries and municipal drains to monitor long-term trends in water quality.

Sampling was conducted biweekly during the months of June to October. The sampling run usually occurred on Tuesdays between 7:00 a.m. and 12:00 noon. Sample analysis was performed by the Ontario Ministry of Environment and Energy at the Southwest Region Office in London. All samples collected were analyzed for the following:

Bacterial Parameters: *E. coli*
Fecal Streptococci
Pseudomonas aeruginosa

Table 4. Bacterial Concentrations in Water Samples Taken at Public Swimming Beaches Along the Lake Huron Shoreline and Inland Swimming Areas in 1993

	(Huron County Health Unit) Percentage of Samples Exceeding MOEE Objective	Geometric Mean (*E. coli* /100ml)
Lakeshore Beaches		
Amberley Beach	40% (2 of 5)	65
Ashfield Twp. Park	50% (6 of 12)	97
Black's Point	54% (7 of 13)	95
Bogie's Beach	60% (3 of 5)	249
Camp Mackenzie	100% (6 of 6)	203
Goderich Main Beach	58% (7 of 12)	126
Goderich South Beach	31% (4 of 13)	39
Huron Church Camp	25% (1 of 4)	44
Kitchigami Camp Road	100% (4 of 4)	276
Port Albert	50% (6 of 12)	74
St. Christopher's Beach	58% (7 of 12)	103
Sunset Beach	30% (3 of 10)	41
Inland Beaches		
Bluevale Dam	0% (0 of 7)	23
Brussels Dam	17% (1 of 6)	30
Falls Reserve	25% (4 of 12)	49
Gorrie Dam	8% (1 of 13)	40

Chemical parameters:
Ammonium Nitrogen
Total Kjeldahl Nitrogen
Nitrate
Nitrite
Total Phosphorus
Soluble Phosphorus
pH
Chloride

Physical Parameters: Conductivity
Turbidity
Temperature

Results of the water quality analysis for all sites are summarized in Appendix B. The maximum, minimum and arithmetic mean values for each parameter are presented. Geometric means have been included for nine selected parameters.

4.2.2 Upstream / Downstream Sampling Sites

Sample Sites D-12 (Downstream) & D-13 (Upstream)

This dairy farm was chosen as a sampling site because three sources of bacterial contamination were suspected to be reaching the Burnett municipal drain in Elm Township before remediation in 1992. These sources included milkhouse washwater, runoff from a solid manure pile, and contamination from cattle access to the municipal drain at a bed level crossing. In 1992, the landowner received CURB grants to install a milkhouse treatment trench, build a roofed solid manure storage, and replace the bed level cattle crossing with an above grade culvert crossing.

The approved projects were not completed until after the 1992 sampling season. Therefore, the 1992 data represents measured parameters before construction and the 1993 data represents levels detected after construction was completed. Figure 4 shows that both upstream and downstream *E. coli* levels were lower in 1993 than in 1992. Bacteria counts are generally higher downstream of the farm, but this contamination may be entering the watercourse through tiles from other sources upstream. Sampling will continue in 1994.

Sample Sites B-14 (Downstream) & B-15 (Upstream)

This Wallace Township dairy operation located on the Elliott-Martine municipal drain was chosen as a sampling station in 1992 because sixty cows and heifers on pasture had unrestricted access to the watercourse. The streambank had been severely trampled, causing soil erosion into the drain. The landowner received a CURB grant to fence the drain using high tensile electric fencing and to construct a mid-grade concrete covered culvert crossing. This work was completed on September 23, 1992.

Sampling continued in 1993 to obtain data representing the water quality after project construction was completed. Figure 5 shows that upstream *E. coli* levels decreased after construction, and downstream levels increased slightly. Other sources of bacterial contamination including manure runoff, milkhouse washwater and livestock access from another farm are still affecting water quality in the drain, and are probably masking the effectiveness of this fencing project.

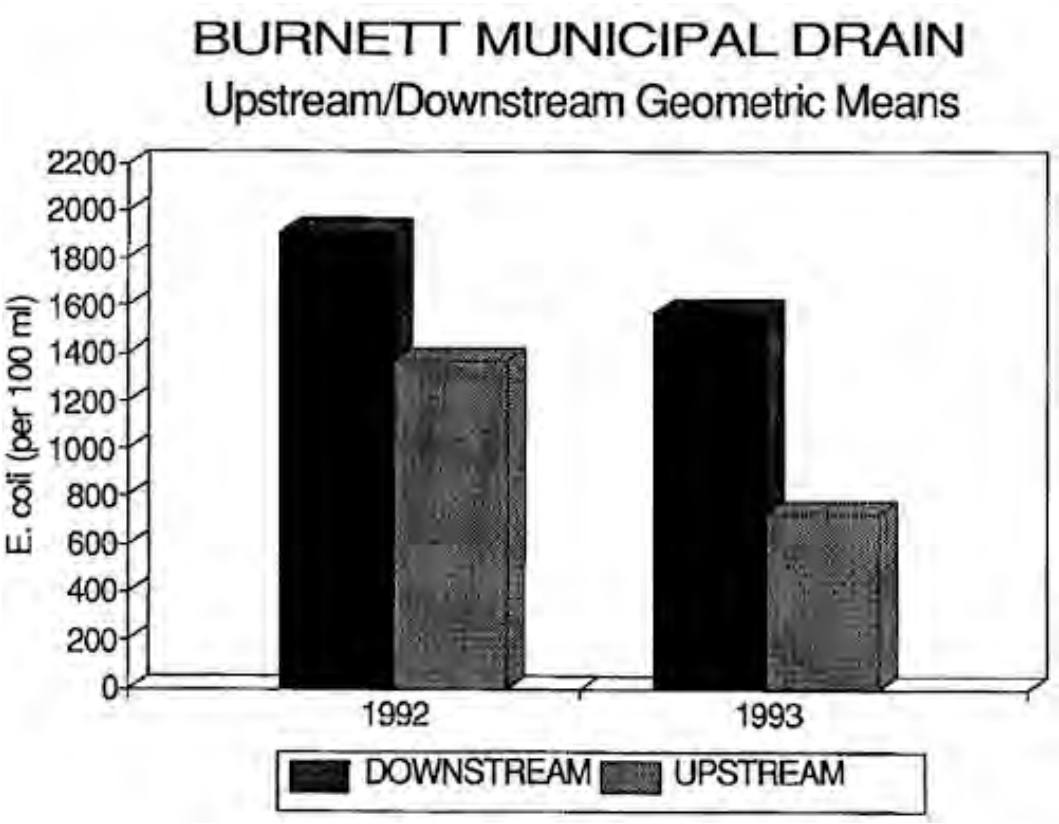

Figure 4: Bacterial Counts at Sampling Sites D-12 and D-13

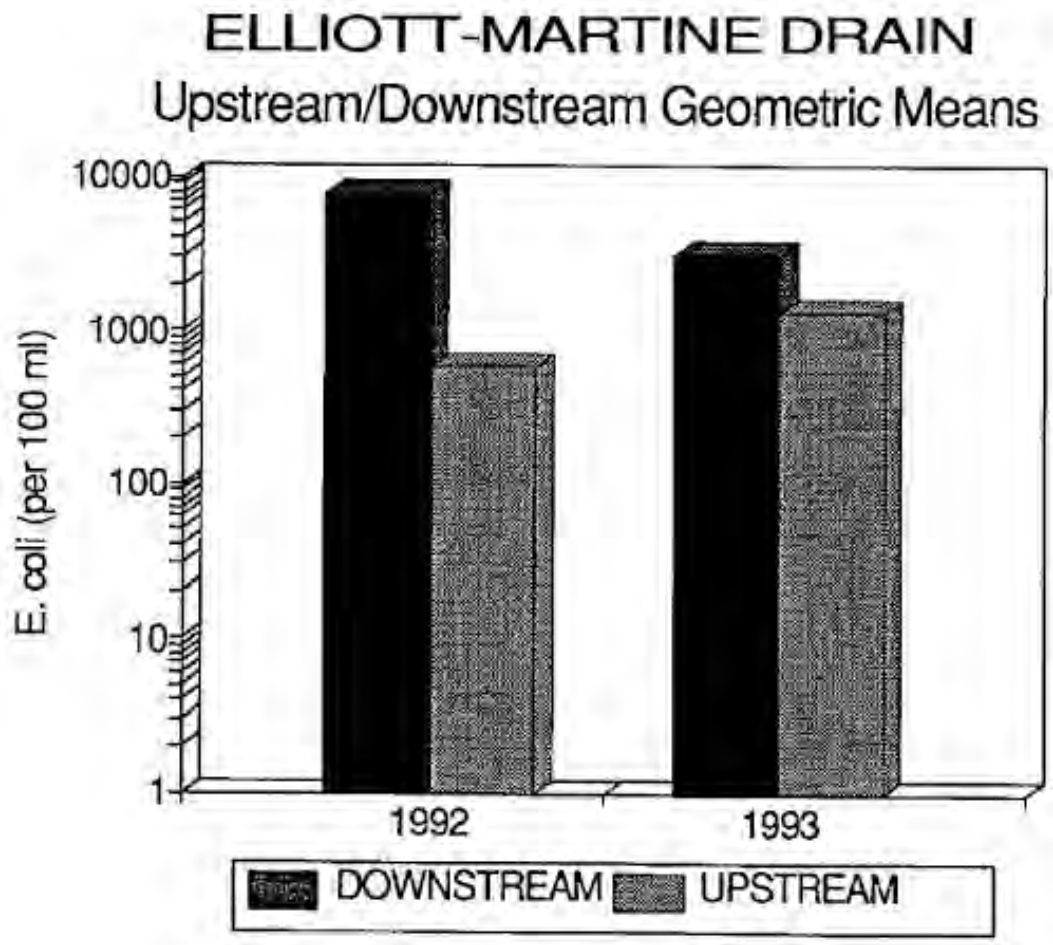

Figure 5: Bacterial Counts at Sampling Sites B-14 and B-15

Sample Site B-16

This sampling site is located at a field tile outlet to the McKenzie municipal drain in Elma Township. Milkhouse wastes from this dairy farm were ponding over a field tile, which also passed under the solid manure storage area adjacent to the watercourse. A CURB grant was provided in 1992 to construct a concrete tank to store all manure and milkhouse wastes.

Figure 6 shows that the geometric mean of samples taken before project completion was much higher than in the period after construction. The data clearly demonstrates the effectiveness of this remedial measure to remove bacterial contamination to the municipal drain. Sampling will continue in 1994.

Sample Sites B-19 (Downstream) & B-20 (Upstream)

Sample sites B-19 and B-20 are located on a beef and cash crop farm in McKillop Township. This farm was chosen as a sampling site because 40 cow/calf pairs had total access to the Barron municipal drain. The landowner received a CURB grant in 1993 to erect a high tensile electric fence which eliminates cattle access to the drain and protects the newly planted mixed species tree buffer strip. The township council directed the drain to be cleaned out in late August before the fence could be erected.

The data illustrated in Figure 7 suggests that cattle access to the drain is causing increased levels of bacteria and nutrients downstream of the pasture. All samples were taken before the fencing to restrict cattle access was erected in October. Sampling will continue in 1994 to measure the effectiveness of remediation.

Sample Site B-5

This farm was designated as a sampling station because the manure pile was located beside an open drain, causing direct runoff into the watercourse. The landowner received a CURB grant to build a concrete wall around the manure yard and a runoff tank. Eavestroughing was installed on the barn roofs to divert clean water from the manure storage. Samples taken in 1992 and 1993 represent the water quality in the drain before construction was completed. This data is shown in Figure 8. Since the project was completed during the winter of 1993 and the spring of 1994, the effectiveness of the new manure storage system has not yet been measured. Sampling is continuing in 1994.

Sample Site B-18

Sampling site B-18 was chosen because the milkhouse washwater from this 40 cow dairy operation in Elma Township was being discharged into a field tile and the Raszman municipal drain. By the end of May 1993, the milkhouse water had been re-directed to a concrete liquid manure tank funded by CURB. No immediate improvement was seen in water quality, probably because effluent from the household septic system was entering the same tile. A new septic system was installed at the end of September under the CURB Program. Sampling will continue in 1994 to determine effects on tile water quality. Bacteria counts in 1993 are illustrated in Figure 9.

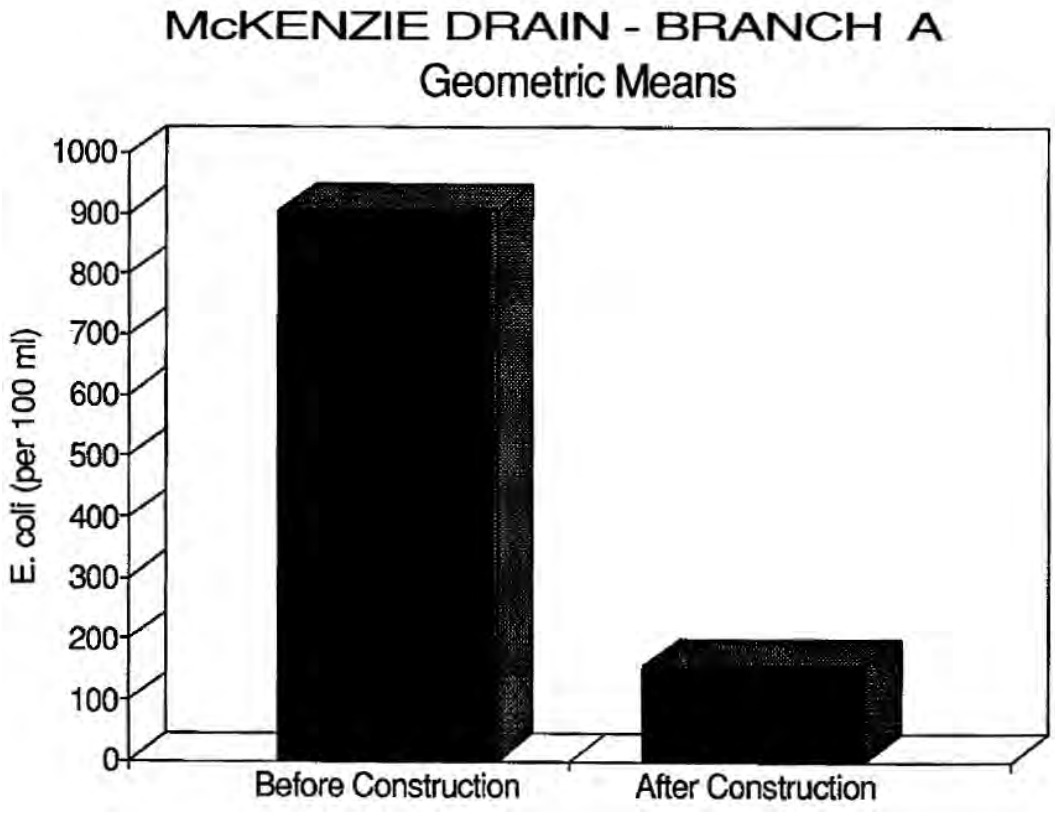

Figure 6: Bacterial Counts at Sampling Site B-16

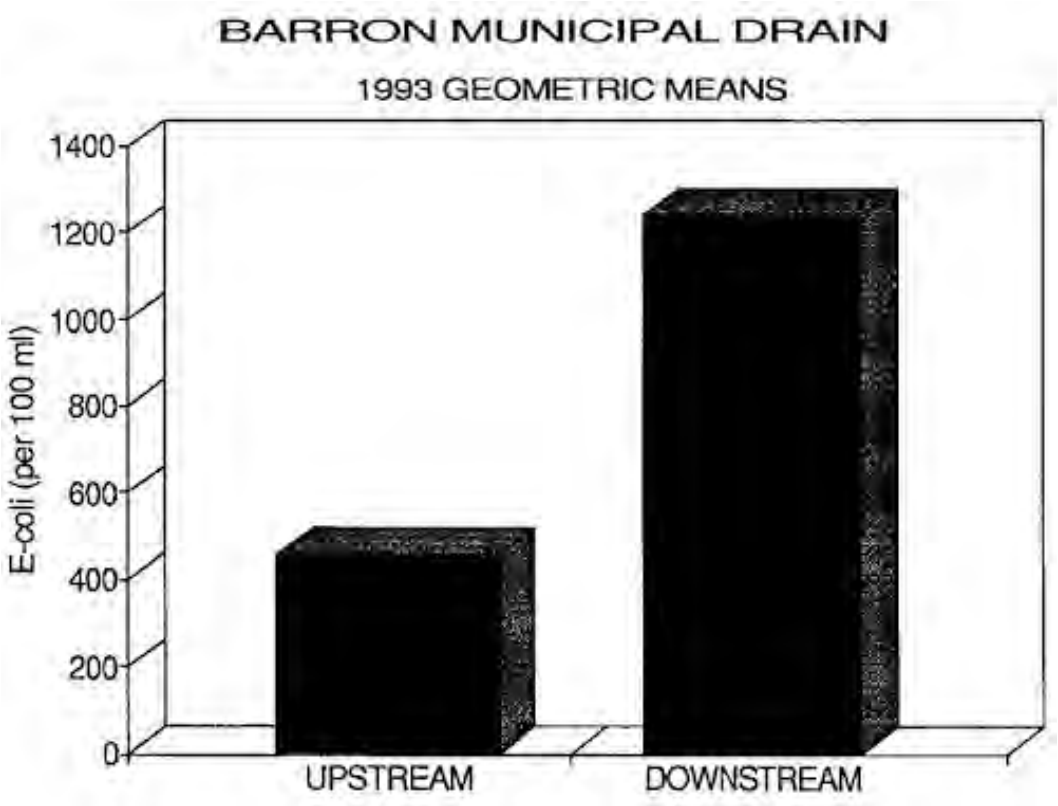

Figure 7: Bacterial Counts at Sampling Site B-19 and B-20

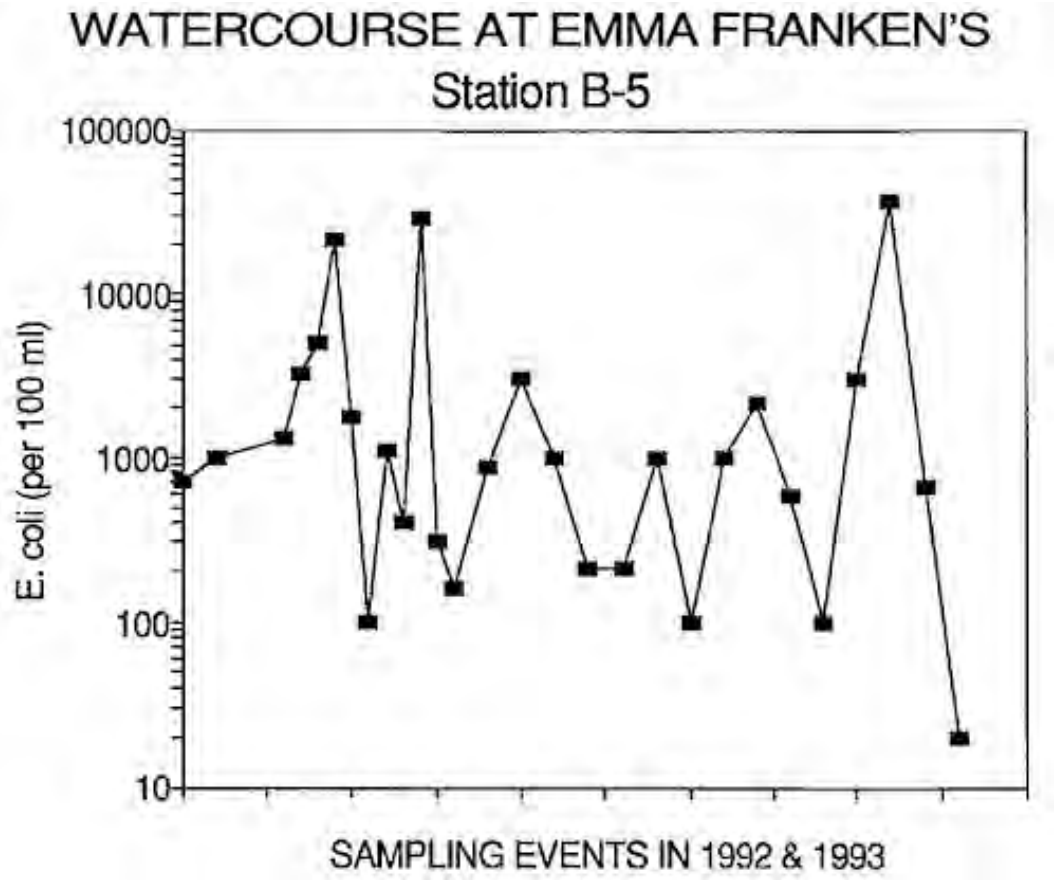

Figure 8: Bacterial Counts at Sampling Site B-5

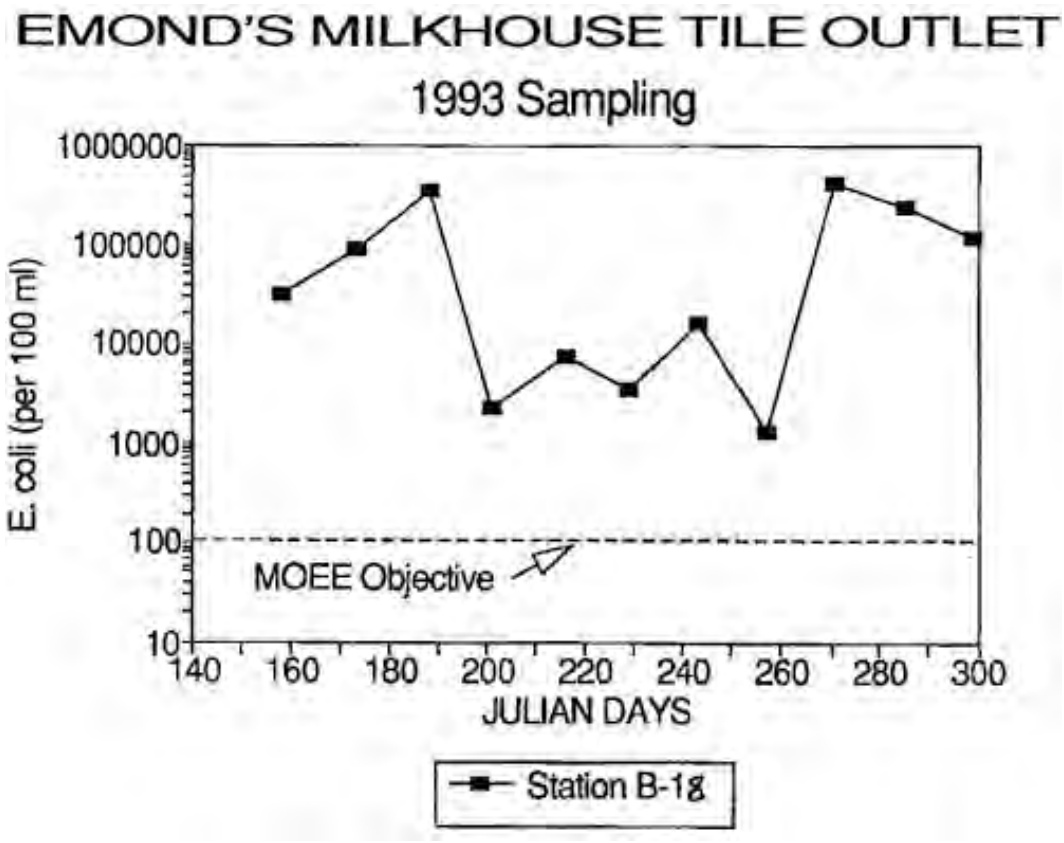

Figure 9: Bacterial Counts at Sampling Site B-18

5.0 REFERENCES

Fuller, R. and M.E. Foran. 1989. Clean Up Rural Beaches Plan for Lake Huron Beaches in the Maitland Valley Conservation Authority watershed. Maitland Valley Conservation Authority. Wroxeter, Ontario.

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Huron County Health Unit. 1993. Water Quality Data at Swimming Beaches. Clinton, Ontario.

APPENDIX A

Information and Education Materials

ATTENTION LANDOWNERS

CURB Program Grants Available

The goal of the CURB (Clean Up Rural Beaches) Program is to reduce bacterial and phosphorus water pollution in rivers and at swimming beaches.

Grants are available to landowners for the repair or replacement of faulty private septic systems. The farm practices and structures listed below also qualify for grants.

Eligible Items	*Grant Rate*	*Grant Ceiling*
-manure storages	50%	$12,000
-milkhouse waste disposal systems	50%	$5,000
-fencing livestock from streams and rivers	75%	$10,000
-private septic systems	50%	$2,000

This program is targeted at agricultural and rural residential areas located upstream of swimming beaches. Financial assistance is limited to those applicants who are polluting watercourses. Projects with the greatest potential to improve water quality will be given priority for funding.

For more information or application forms contact the Maitland Valley Conservation Authority at 335-3557.

The CURB Program is funded by the Ontario Ministry of the Environment and the Maitland Valley Conservation Authority.

MAITLAND VALLEY CONSERVATION AUTHORITY

Maitland Valley
Conservation Authority
Box 127,
Wroxeter, Ontario
N0G 2X0
(519) 335-3557

Ontario

Maitland Valley Conservation Authority
Box 127,
Wroxeter, On. N0G 2X0
(519) 335-3557, fax. (519) 335-3516

Fact Sheet

Septic Systems- A Hidden Problem

When it comes to septic systems, the phrase out of sight, out of mind is usually appropriate. Tucked away underground in the back yard, the septic system does an important job. Not many people realize the damage it can do when it is improperly constructed or maintained.

Studies completed by the Maitland Valley Conservation Authority (MVCA) suggest that failed septic systems are the largest source of bacterial pollution in the watershed and at Lake Huron beaches. A 1989 study showed that about 65 percent of the bacterial pollution found in our waterways originates from malfunctioning septic systems. Septic systems may also be a significant source of phosphorus pollution. Other common sources of bacterial pollution include cattle access to streams and rivers, and poor manure spreading and storage practices.

Bacterial pollution is common along the Lake Huron shoreline. The presence of fecal bacteria does not change the appearance of water, but it does pose an immediate health hazard if the water is used for drinking or swimming. Waterborne infections include stomach flu and diarrhoea. Eye, ear, and throat infections can also occur.

In a survey completed in 1987 and 1988 it was found that less than half the septic systems in the watershed were serviced at regular intervals. More recent surveys of lakeshore cottages and local hamlets showed similar results. It is estimated that 30 percent, or 2700 household septic systems in the Maitland watershed, are not functioning properly and have the potential to pollute rivers, streams and Lake Huron.

Septic systems are designed to take household wastes such as sewage and waste waters from kitchens and bathrooms, and to treat and store the solid part of wastes and disperse the liquid portion into the ground. When septic systems are poorly installed or maintained, the waste may end up contaminating local waterways with bacteria and nutrients.

Waste water from sinks, showers and laundry facilities are called grey water. Unfortunately grey water is sometimes disposed of through drainage tiles or storm sewers instead of being directed to septic tanks. Besides high concentrations of bacteria, grey water contains nutrients such as phosphorus, which causes the growth of excess algae in streams, and damages other aquatic life forms.

The Ministry of the Environment recommends that home owners have their septic tank inspected every two years and pumped when required, usually every three to five years. Inspections and clean outs should only be carried out by licensed professionals. Never attempt to inspect a system yourself. New systems, or any enlargements or extensions, must be approved by the local Health Unit.

Homeowners who live close to Lake Huron who suspect their septic system may be in need of repairs or replacement may be eligible for grant assistance under the CURB (Clean Up Rural Beaches) Program. Anyone interested in application forms or further information on this program should contact the Maitland Valley Conservation Authority at 335-3557.

The goal of the Maitland Valley Conservation Authority is to preserve, restore, enhance and sustain soil and water resources in the Maitland watershed.

ATTENTION
Farmers and Homeowners

CURB Program Grants Available

The CURB Program (Clean Up Rural Beaches) is offering financial assistance to farmers and homeowners for specified projects to improve water quality in rivers and streams. Grants are available for the repair or rebuilding of private septic systems, construction of manure storages, milkhouse waste water disposal systems, and to fence livestock from watercourses.

Eligible Items	*Grant Rate*	*Grant Ceiling*
-manure storages	50%	$12,000
-milkhouse waste disposal systems	50%	$5,000
-fencing livestock from rivers	75%	$10,000
-private septic systems	50%	$2,000

This program is targeted at agricultural and rural residential areas located upstream of swimming beaches. Financial assistance is limited to those applicants who are polluting watercourses. Proposed projects with the greatest potential for improving water quality will be considered first for funding.

For more information or application forms contact the Maitland Valley Conservation Authority. The CURB Program is funded by the Ministry of the Environment, and the Maitland Valley Conservation Authority.

Maitland Valley Conservation Authority
Box 127,
Wroxeter, Ont
N0G 2X0
(519) 335-3557

Ontario

Box 127
Wroxeter,- Ontario, N0G 2X0
519-335-557 Fax - 519- 335-3516

Media Release

Water Conservation and Regular Servicing are Important Parts of Proper Septic System Maintenance

June 23, 1993

Household water conservation and regular servicing are important in keeping a septic system working properly. A system will fail when the owner attempts to dispose of more waste water than the system can handle, or when a full tank is not pumped. It is costly to replace a failed septic system. In addition, a failed or poorly maintained system can pollute nearby watercourses and groundwater with bacteria and nutrients.

"Most homeowners can take some simple and inexpensive steps to reduce water use in their home," noted Anne Loeffler, Rural Water Quality Technician with the Maitland Valley Conservation Authority (MVCA). Leaky faucets and running toilets should be repaired immediately, said Loeffler. Low-flow shower heads and flow restrictors for water faucets are readily available and will reduce the volume of waste water entering the septic system. Toilet tank dams and water saving toilets are also available. These devices reduce the amount of water used on each flush.

Septic systems are designed to take household wastes such as sewage and waste waters from bathrooms and kitchens. The solid waste is treated and stored. The liquid part is dispersed into the ground. A typical system consists of a tank to store solids and a series of drainage tiles called a weeping bed which distributes the liquid waste. When more water runs through the system than it is designed to handle, there are problems. Solids that normally stay in the tank are washed into the weeping bed, and can plug the tiles. This can leave a homeowner with waste water backing up into their basement.

Besides water conservation measures it is important to have systems inspected every two years and to have the septic tank pumped when necessary. Failure to pump out a septic tank when required may result in a plugged weeping bed. Inspections and pumping must be conducted by licensed personnel only.

Other Suggestions for Septic System Maintenance

1) Do not dispose of toxic items such as paints, varnishes, oils, acids, and medicines through your septic system. These may kill microorganisms needed to keep the system operating, or may contaminate groundwater.

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2) Substances that will not break down such as cat litter, ash tray contents, diapers, fat from cooking, garbage disposal refuse, and paper (other than toilet paper) should not enter the septic tank. These will clog pipes, and fill your septic tank more quickly.

3) Soaps, household cleaners, disinfectants and bleach can all interfere with proper functioning of the system. Use phosphate-free soaps and limit the use of other cleaners.

4) Keep excess water such as drainage from eavestroughs and basement sumps out of the septic tank and away from the weeping bed. Excessive water can cause ponding on the weeping bed surface, creating a health hazard.

5) If automatic washers and dishwashers are used, make sure full loads are washed each time. Excessive water use (such as doing many loads in one day) should be avoided because it could flush solids from the tank to the weeping bed.

6) Protect your weeping bed tiles! Keep all vehicle traffic off the weeping bed to prevent the tiles from being crushed. Trees or shrubs should not be planted in the weeping bed area, since their roots may clog the tiles.

7) Grass on the surface of the weeping bed should be mown regularly to promote evaporation from the soil.

8) Have your system inspected and serviced regularly by licensed personnel.

9) Know the location of your septic tank and weeping bed, and keep a record of when your tank was pumped out and inspected.

-30-

For more information contact:

Anne Loeffler
Rural Water Quality Technician

or

Paul Weitendorf
Communications Coordinator

Box 127
Wroxeter,- Ontario, N0G 2X0
519-335-557 Fax - 519- 335-3516

Media Release

Grant Assistance Available to Reduce Water Pollution

June 17, 1993

Farmers and homeowners can now receive grant assistance to help clean up sources of water pollution. Under the CURB Program (Clean Up Rural Beaches), grants are available to construct manure storages, to fence livestock out of watercourses, to install milkhouse washwater disposal systems, and to repair private septic systems.

The CURB Program is designed to help clean up sources of bacteria and phosphorus pollution that affect water quality in the Maitland, Nine Mile and Eighteen Mile Rivers. To date, over $1 million in grants have been issued to farmers and landowners for the completion of about 200 projects. This voluntary program is funded by the Ministry of the Environment and Energy and the Maitland Valley Conservation Authority (MVCA).

"Farmers and homeowners who are interested in taking advantage of grant assistance in 1993 should contact the MVCA office now" said Anne Loeffler, MVCA water quality technician. Application forms and further information are available by calling 335-3557.

Financial assistance is limited to applicants who are polluting surface waters. Proposed projects with the greatest potential for reducing pollution will be considered first for funding.

The CURB Program offers 50 percent grants up to $2,000 to repair or replace a septic system that is polluting a nearby watercourse. Farmers can receive a 75 percent grant up to a total of $10,000 to pay for costs of fencing livestock out of watercourses. Grants are also available for the construction of a crossing and an alternate water source as part of a fencing project. Manure storages are eligible for a 50 percent grant up to $12,000. The grant for milkhouse washwater disposal systems is 50 percent, with a maximum grant of $5,000.

In the past many sources of bacterial pollution were identified, including sewage treatment plant discharges, barnyard manure run-off, manure spills, and many others. However, the CURB study, completed by the MVCA in 1989, indicated that the most common source of bacterial pollution in the Maitland River watershed is faulty septic systems.

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Grant Assistance - Page 2

The presence of fecal bacteria does not change the appearance of water, but it does pose an immediate health hazard if the water is used for drinking or swimming. Waterborne infections include stomach flu and diarrhoea. Eye, ear and throat infections can also occur. Cattle watering in the river can also be infected with disease-causing organisms from upstream herds.

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For more information contact:

Anne Loeffler
Rural Water Quality Technician

or

Paul Weitendorf
Communications Coordinator

Box 127
Wroxeter,- Ontario, N0G 2X0
519-335-557 Fax - 519- 335-3516

Media Release

Algae Blooms: When time River turns Green

August 10, 1993

Algae are common aquatic plants that are present in streams, rivers, ponds and lakes. Usually they are hardly noticeable. However, when conditions are right, algae can 'bloom' dramatically growing into a large mat of vegetation that can cover the surface of a stream or river leaving it unfit for swimming and smelling unpleasant. When the algae eventually die, the decomposing plants deplete the oxygen supply in the watercourse. This leaves the stream less capable of supporting fish and other aquatic life.

"During July and August the Maitland Valley Conservation Authority (MVCA) receives inquiries from landowners concerned about algae blooms," said Anne Loeffler, MVCA water quality technician. "Unfortunately, once a bloom occurs nothing can be done to stop it. The bloom will stay on the river until it decomposes or until next major rainfall raises water levels in the river and washes it away."

Algae blooms are caused mainly by an excess of phosphorus in the water, noted Loeffler. The phosphorus acts as fertilizer, speeding the growth of the algae. Often blooms occur after abrupt changes in weather or when there is a particularly large amount of phosphorus in the water. Regular water sampling conducted by the MVCA shows that phosphorus levels in the Maitland River are generally above those recommended by the provincial government for acceptable recreational water quality.

There are a variety of common sources of phosphorus pollution in the Maitland River. These include washwater from milkhouses, sewage plant discharges and farm fertilizers. Most detergents used in milkhouses contain phosphorus. On average, 35 kg of phosphorus are discharged annually from a typical dairy farm. This is the equivalent to dumping 600 kg of laundry detergent into the river each year. Phosphorus in the form of farm chemical fertilizers gets into watercourses attached to eroded soil particles. At three locations on the Thames River it has been estimated that soil erosion accounts for half the total phosphorus pollution.

There are many small sources of phosphorus pollution contributing to this problem. As a result, cleaning up phosphorus pollution will require the cooperation of many people. The average homeowner can contribute to the solution by reducing the amount of soaps and detergents they use or by using soaps that are low in phosphates. On dairy farms milkhouse washwater can be properly disposed of through septic tank treatment trenches, or by directing the washwater into a liquid manure storage. Soil erosion can be reduced through the use of soil conservation practices such as reduced tillage, the use of cover crops, and crop rotation. The potential for phosphorus pollution can be decreased by reducing the use of chemical fertilizers and avoiding the over-application of livestock manure.

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The MVCA offers a variety of soil conservation assistance services. Through the CURB (Clean Up Rural Beaches Program), the MVCA also offers grants for milkhouse washwater disposal systems.

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For more information, contact:

Anne Loeffler
Rural Water Quality Technician

Or

Chris Hoskins
Soil and Water Conservation Technician

Maitland Valley
Conservation Authority

Media Release

Working for a Healthy Environment

Grants Assistance Available to Reduce Water Pollution

June 11, 1993

Farmers and homeowners can now receive grant assistance to help clean up sources of water pollution. Under the CURB Program (Clean Up Rural Beaches), grants are available to construct manure storages, to fence livestock out of watercourses, to install milkhouse washwater disposal systems, and to repair private septic systems.

The CURB Program is designed to help clean up sources of bacteria and phosphorus pollution that affect water quality in the Maitland, Nine Mile and Eighteen Mile Rivers. To date, over $1 million in grants have been issued to farmers and landowners for the completion of about 200 projects. This voluntary program is funded by the Ministry of the Environment and Energy and the Maitland Valley Conservation Authority (MVCA).

"Farmers and homeowners who are interested in taking advantage of 'grant assistance in 1993 should contact the MVCA office now" said Anne Loeffler, MVCA water quality technician. Application forms and further information are available by calling 335-3557.

Financial assistance is limited to applicants who are polluting surface waters. Proposed projects with the greatest potential for reducing pollution will be considered first for funding.

The CURB Program offers 50 percent grants up to $2,000 to repair or replace a septic system that is polluting a nearby watercourse. Farmers can receive a 75. percent grant up to a total of $10,000 to pay for costs of fencing livestock out of watercourses. Grants are also available for the construction of a crossing and an alternate water source as part of a fencing project. Manure storages are eligible for a 50 percent grant up to $12,000. The grant for milkhouse washwater disposal systems is 50 percent, with a maximum grant of $5,000.

In the past many sources of bacterial pollution were identified, including sewage treatment plant discharges, barnyard manure run-off, manure spills, and many others. However, the CURB study, completed by the MVCA in 1989, indicated that the most common source of bacterial pollution in the Maitland River watershed is faulty septic systems.

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Box 127, Wroxeter, Ontario N0G 2X0 (519) 335-3557 FAX. (519) 335-3516

Grant Assistance - Page 2

The presence of fecal bacteria does not change the appearance of water, but it does pose an immediate health hazard if the water is used for drinking or swimming. Waterborne infections include stomach flu and diarrhoea. Eye, ear and throat infections can also occur. Cattle watering in the river can also be infected with disease-causing organisms from upstream herds.

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For more information contact:

Anne Loeffler
Rural Water Quality Coordinator

Or

Paul Weitendorf
Communications Coordinator

APPENDIX B

Water Quality Data

1993 CURB PROGRAM - WATER QUALITY DATA

STATION D-70 This site is on the Little Maitland River at L15 C2 Grey Township.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
7:20	JUNE 7	130	0.01	210	0.033	0.84	0.02	2.1	0.063	0.014	7.86	13.5	592	21.4	14.0
7:15	JUNE 22	770	12	1000	0.034	1.44	0.09	7.5	0.140	0.081	7.68	10.9	502	5.2	16.5
7:00	JULY 7	20	0.01	1000	0.060	0.83	0.04	3.4	0.040	0.001	8.19	13.8	593	10.0	15.0
7:20	JULY20	280	0.01	400	0.005	0.82	0.05	1.8	0.082	0.017	7.91	15.1	554	28.7	19.0
7:20	AUG 4	270	0.01	580	0.044	1.22	0.01	0.9	0.132	0.004	7.95	16.8	561	40.4	19.0
7:25	AUG 17	2500	0.01	170	0.106	1.03	0.01	0.2	0.096	0.004	7.93	15.2	545	23.0	21.0
7:20	AUG 31	340	0.01	160	0.006	0.94	0.02	0.2	0.144	0.027	7.93	14.8	539	302	23.0
7:20	SEPT 14	210	0.01	310	0.019	0.84	0.01	1.4	0.080	0.016	8.07	22.5	629	24.5	21.5
7;20	+SEPT 28	270	0.01	220	0.050	0.79	0.01	1.1	0.050	0.010	7.97	18.4	614	18.3	11.0
7:25	OCT 12	60	0.01	10	0.005	0.60	0.01	1.9	0.018	0.003	7.93	19.9	695	5.0	14.0
7:25	OCT 26	32	0.01	8	0.050	0.72	0.01	3.7	0.023	0.001	8.05	19.1	725	14.0	15.0
	minimum	20	0.01	8	0.005	0.6	0.01	0.2	0.018	0.001	7.68	10.9	502	5.0	11.0
	maximum	2500	12	1000	0.106	1.44	0.09	7.5	0.144	0.081	8.19	22.5	725	40.4	23.0
	average	444	1.10	370	0.04	0.9	0.03	2.2	0.08	0.02	8.0	16.4	595	20.1	172
	Geo.Mean	193	0.02	182	0.02	0.9	0.02	1.4	0.06						
	S.D.			403				2.3	0.05						

+ represents wet weather samples

DRY WEATHER SAMPLES

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
7:20	JUNE 7	130	0.01	210	0.033	0.84	0.02	2.1	0.063	0.014	7.86	13.5	592	21.4	14.0
7:15	JUNE 22	770	12	1000	0.034	1.44	0.09	7.5	0.140	0.081	7.68	10.9	502	5.2	16.5
7:00	JULY 7	20	0.01	1000	0.060	0.83	0.04	3.4	0.040	0.001	8.19	13.8	593	10.0	15.0
7:20	JULY20	280	0.01	400	0.005	0.82	0.05	1.8	0.082	0.017	7.91	15.1	554	28.7	19.0
7:20	AUG 4	270	0.01	580	0.044	1.22	0.01	0.9	0.132	0.004	7.95	16.8	561	40.4	19.0
7:25	AUG 17	2500	0.01	170	0.106	1.03	0.01	02	0.096	0.004	7.93	15.2	545	23.0	21.0
7:20	AUG 31	340	0.01	160	0.006	0.94	0.02	02	0.144	0.027	7.93	14.8	539	30.2	23.0
7:20	SEPT 14	210	0.01	310	0.019	0.84	0.01	1.4	0.080	0.016	8.07	22.5	629	24.5	21.5
7:25	OCT 12	60	0.01	10	0.005	0.6	0.01	1.9	0.018	0.003	7.93	19.9	695	5.0	14.0
7:25	OCT 26	32	0.01	8	0.050	0.72	0.01	3.7	0.023	0.001	8.05	19.1	725	14.0	15.0
	minimum	20	0.01	8	0.005	0.6	0.01	0.2	0.018	0.001	7.68	10.9	502	5.0	14.0
	maximum	2500	12	1000	0.106	1.44	0.09	7.5	0.144	0.081	8.19	22.5	725	40.4	23.0
	average	461	1.21	385	0.04	0.9	0.03	2.3	0.08	0.02	8.0	162	594	202	17.8
	Geo.Mean	187	0.02	179	0.02	0.9	0.02	1.4	0.07						
	S.D.			426				24	0.05						

1993 CURB PROGRAM - WATER QUALITY DATA

STATION B-14 This site is downstream of Rien & Anja Noordam's fencing project.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
7:50	JUNE 7	550	0.01	1000	0.332	0.99	0.16	5.7	0.260	0.196	7.71	12.8	584	5.0	12.0
7:45	JUNE 22	1500	180	8800	0.088	0.98	0.12	7.7	0.134	0.079	7.49	13.0	592	8.9	14.0
7:25	JULY 7	1500	48	56000	0.055	0.60	0.15	5.8	0.158	0.110	7.64	11.7	627	5.0	11.0
7:45	JULY 20	3900	36	15000	0.010	0.78	0.17	4.7	0.200	0.151	7.65	35.6	674	6.9	15.5
7:45	AUG 4	44000	232	640000	0.106	1.46	0.17	3.5	0.650	0.400	7.65	23.8	610	25.1	15.0
7:45	AUG 17	3100	4	190	0.138	0.84	0.18	4.4	0.226	0.165	7.69	12.0	634	11.9	16.0
7:45	AUG 31	5200	24	13700	0.005	0.85	0.19	3.3	0.255	0.201	7.65	15.7	612	5.0	21.5
7:45	SEPT 14	1100	0.01	320	0.005	0.65	0.13	5.0	0.184	0.131	7.85	21.8	671	5.2	20.5
7:50	+SEPT 28	28000	4	24000	0.100	0.96	0.05	5.0	0.250	0.140	7.80	18.0	656	3.8	10.0
7:50	OCT 12	260	0.01	100	0.019	0.54	0.03	6.1	0.143	0.117	7.80	20.9	708	5.0	10.5
7:50	OCT 26	660	0.01	40	0.036	0.48	0.03	5.5	0.109	0.080	7.88	19.5	717	14.4	13.0
	minimum	260	0.01	40	0.005	0.48	0.03	3.3	0.109	0.079	7.49	11.7	584	3.8	10.0
	maximum	44000	232	640000	0.332	1.46	0.19	7.7	0.650	0.400	7.88	35.6	717	25.1	21.5
	average	8161	48.0	69014	0.08	0.8	0.13	5.2	0.23	0.16	7.7	18.6	644	8.7	14.5
	Geo.Mean	2438	1.67	3214	0.04	0.8	0.10	5.0	0.21						
	S.D.			202247				1.2	0.15						

+ represents wet weather samples

DRY WEATHER SAMPLES

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
7:50	JUNE 7	550	0.01	1000	0.332	0.99	0.16	5.7	0260	0.196	7.71	12.8	584	5.0	12.0
7:45	JUNE 22	1500	180	8800	0.088	0.98	0.12	7.7	0.134	0.079	7.49	13.0	592	8.9	14.0
7:25	JULY 7	1500	48	56000	0.055	0.60	0.15	5.8	0.158	0.110	7.64	11.7	627	5.0	11.0
7:45	JULY 20	3900	36	15000	0.010	0.78	0.17	4.7	0.200	0.151	7.65	35.6	674	6.9	15.5
7:45	AUG 4	44000	232	640000	0.106	1.46	0.17	3.5	0.650	0.400	7.65	23.8	610	25.1	15.0
7:45	AUG 17	3100	4	190	0.138	0.84	0.18	4.4	0.226	0.165	7.69	12.0	634	11.9	16.0
7:45	AUG 31	5200	24	13700	0.005	0.85	0.19	3.3	0.255	0.201	7.65	15.7	612	5.0	21.5
7:45	SEPT 14	1100	0.01	320	0.005	0.65	0.13	5.0	0.184	0.131	7.85	21.8	671	5.2	20.5
7:50	OCT 12	260	0.01	100	0.019	0.54	0.03	6.1	0.143	0.117	7.80	20.9	708	5.0	10.5
7:50	OCT 26	660	0.01	40	0.036	0.48	0.03	5.5	0.109	0.080	7.88	19.5	717	14.4	13.0
	minimum	260	0.01	40	0.005	0.48	0.03	3.3	0.109	0.079	7.49	11.7	584	5.0	10.5
	maximum	44000	232	640000	0.332	1.46	0.19	7.7	0.650	0.4	7.88	35.6	717	25.1	21.5
	average	6177	52.4	73515	0.08	0.8	0.13	5.2	0.23	0.16	7.7	18.7	643	9.2	14.9
	Geo.Mean	1910	1.53	2629	0.04	0.8	0.11	5.0	0.20						
	S.D.			213289				1.3	0.16						

1993 CURB PROGRAM - WATER QUALIFY DATA

STATION B-15 This site is upstream of Rien & Anja Noordam's fencing project.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
7:55	JUNE 7	290	0.01	1000	0.387	1.00	0.10	6.8	0.340	0.270	7.66	14.5	605	5.0	11.5
7:50	JUNE 22	1500	244	6200	0.068	0.98	0.14	7.6	0.115	0.067	7.44	13.1	562	7.3	13.5
7:20	JULY 7	1500	512		0.125	0.56	0.16	7.2	0.205	0.164	7.77	12.2	628	5.0	10.5
7:50	JULY 20	1500	40	1000	0.005	0.59	0.18	6.5	0.200	0.158	7.73	31.1	667	3.7	15.5
7:50	AUG 4	49000	84	91000	0.125	1.48	0.11	3.9	0.610	0.390	7.71	59.1	700	112	15.0
7:50	AUG 17	3200	0.01	500	0.005	0.59	0.05	7.7	0.216	0.129	7.83	11.7	634	13.7	16.0
7:50	AUG 31	1500	28	1000	0.006	0.69	0.08	7.3	0.205	0.167	7.81	13.6	622	5.0	21.5
7:50	SEPT 14	2100	4	1100	0.026	0.53	0.05	7.9	0.166	0.132	7.93	21.6	637	5.8	18.0
7:55	+SEPT 28	240000	40	90000	0.070	0.98	0.04	5.9	0.360	0.240	7.78	20.0	640	7.8	10.0
7:55	OCT 12	80	0.01	20											10.5
7:55	OCT 26	80	0.01	32	0.017	0.65	0.04	6.6	0.126	0.002		20.9		5.0	13.0
	minimum	80	0.01	20	0.005	0.53	0.04	3.9	0.115	0.002	7.44	11.7	562	3.7	10.0
	maximum	240000	512	91000	0.387	1.48	0.18	7.9	0.610	0.390	7.93	59.1	700	13.7	21.5
	average	27341	86.5	19185	0.08	0.8	0.10	6.7	0.25	0.17	7.7	21.8	633	7.0	14.1
	Geo.Mean	1824	2.45	1334	0.03	0.8	0.08	6.6	0.22						
	S.D.			42071				1.2	0.15						

+ represents wet weather samples

DRY WEATHER SAMPLES

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
7:55	JUNE 7	290	0.01	1000	0.387	1.00	0.10	6.8	0.340	0.270	7.66	14.5	605	5.0	11.5
7:50	JUNE 22	1500	244	6200	0.068	0.98	0.14	7.6	0.115	0.067	7.44	13.1	562	7.3	13.5
7:20	JULY 7	1500	512		0.125	0.56	0.16	7.2	0.205	0.164	7.77	12.2	628	5.0	10.5
7:50	JULY 20	1500	40	1000	0.005	0.59	0.18	6.5	0.200	0.158	7.73	31.1	667	3.7	15.5
7:50	AUG 4	49000	84	91000	0.125	1.48	0.11	3.9	0.610	0.390	7.71	59.1	700	112	15.0
7:50	AUG 17	3200	0.01	500	0.005	0.59	0.05	7.7	0.216	0.129	7.83	11.7	634	13.7	16.0
7:50	AUG 31	1500	28	1000	0.006	0.69	0.08	7.3	0.205	0.167	7.81	13.6	622	5.0	21.5
7:50	SEPT 14	2100	4	1100	0.026	0.53	0.05	7.9	0.166	0.132	7.93	21.6	637	5.8	18.0
7:55	OCT 12	80	0.01	20											10.5
7:55	OCT 26	80	0.01	32	0.017	0.65	0.04	6.6	0.126	0.002		20.9		5.0	13.0
	minimum	80	0.01	20	0.005	0.53	0.04	3.9	0.115	0.002	7.44	11.7	562	3.7	10.5
	maximum	49000	512	91000	0.387	1.48	0.18	7.9	0.610	0.39	7.93	59.1	700	13.7	21.5
	average	6075	912	11317	0.08	0.8	0.10	6.8	0.24	0.16	7.70	22.0	632	6.9	14.5
	Geo.Mean	1120	1.85	836	0.03	0.7	0.09	6.7	0.21						
	S.D.			31937				1.2	0.16						

1993 CURB PROGRAM WATER QUALITY DATA

STATION D-12 This is the downstream sample site at Abner Martin's culvert cattle crossing.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
8:10	JUNE 7	550	0.01	1000	0.088	1.06	0.07	0.7	0.065	0.018	7.68	16.8	566	5.0	13.0
8:20	JUNE 22	1500	24	1000	0.071	1.18	0.10	11.9	0.192	0.141	7.50	12.1	596	7.4	14.5
7:55	JULY 7	830	4		0.024	0.98	0.06	2.0	0.073	0.043	7.80	18.0	643	5.0	21.0
8:05	JULY 20	990	0.01	2800	0.014	0.82	0.05	12	0.101	0.072	7.71	19.2	580	5.0	18.5
8:10	AUG 4	1500	0.01	8600	0.005	1.17	0.01	0.1	0.208	0.071	7.70	20.0	520	7.4	17.0
8:10	AUG 17	1000	0.01	700	0.232	1.80	0.02	0.2	0.350	0.153	7.69	18.1	544	9.0	19.5
8:00	AUG 31	14800	40	40000	0.090	1.36	0.06	0.2	0.188	0.085	7.56	19.9	522	7.7	23.0
8:05	+SEPT 14	150	0.01	170	1.010	2.62	0.15	1.2	0.440	0.280	7.92	31.0	785	5.6	20.5
8:10	+SEPT 28	23000	4	18000	0.120	1.14	0.08	1.7	0.290	0.170	7.88	23.6	663	9.5	10.0
8:15	OCT 12	190	0.01	380	0.033	0.66	0.02	5.4	0.063	0.051	7.94	22.8	786	47.3	12.5
8:15	OCT 26	100	0.01	120	0.034	0.59	0.02	5.6	0.055	0.020	7.97	20.9	760	24.4	13.0
	minimum	100	0.01	120	0.005	0.59	0.01	0.1	0.055	0.018	7.50	12.1	520	5.0	10.0
	maximum	23000	40	40000	1.010	2.62	0.15	11.9	0.440	0.28	7.97	31	786	47.3	23.0
	average	4055	6.55	7277	0.16	1.2	0.06	2.745	0.18	0.10	7.80	20.2	633	12.1	16.6
	Geo.Mean	999	0.13	1575	0.06	1.1	0.04	1.2	0.14						
	S.D.			14168				4.0	0.14						

\+ represents wet weather samples

DRY WEATHER SAMPLES

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
8:10	JUNE 7	550	0.01	1000	0.088	1.06	0.07	0.7	0.065	0.018	7.68	16.8	566	5.0	13.0
8:20	JUNE 22	1500	24	1000	0.071	1.18	0.10	11.9	0.192	0.141	7.50	12.1	596	7.4	14.5
7:55	JULY 7	830	4		0.024	0.98	0.06	2.0	0.073	0.043	7.80	18.0	643	5.0	21.0
8:05	JULY 20	990	0.01	2800	0.014	0.82	0.05	12	0.101	0.072	7.71	19.2	580	5.0	18.5
8:10	AUG 4	1500	0.01	8600	0.005	1.17	0.01	0.1	0.208	0.071	7.70	20.0	520	7.4	17.0
8:10	AUG 17	1000	0.01	700	0.232	1.80	0.02	02	0.350	0.153	7.69	18.1	544	9.0	19.5
8:00	AUG 31	14800	40	40000	0.090	1.36	0.06	02	0.188	0.085	7.56	19.9	522	7.7	23.0
8:15	OCT 12	190	0.01	380	0.033	0.66	0.02	5.4	0.063	0.051	7.94	22.8	786	47.3	12.5
8:15	OCT 26	100	0.01	120	0.034	0.59	0.02	5.6	0.055	0.02	7.97	20.9	760	24.4	13.0
	minimum	100	0.01	120	0.005	0.59	0.01	0.1	0.055	0.018	7.50	12.1	520	5.0	12.5
	maximum	14800	40	40000	0.232	1.8	0.1	11.9	0.350	0.153	7.97	22.8	786	47.3	23.0
	average	2384	756	6825	0.07	1.1	0.05	3.0	0.14	0.07	7.70	18.6	613	13.1	16.889
	Geo. Mean	870	0.12	1535	0.04	1.0	0.04	1.1	0.12						
	S.D.			14823				4.5	0.10						

1993 CURB PROGRAM WATER QUALITY DATA

STATION D-13 This is the upstream sample site at Abner Martin's culvert cattle crossing.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
8:20	JUNE 7	310	0.01	1000	0.120	1.05	0.06	0.6	0.081	0.045	7.82	16.3	585	5.0	13.0
8:50	JUNE 22	1500	36	1000	0.072	1.22	0.10	11.9	0.186	0.140	7.50	12.5	581	7.8	14.5
8:10	JULY 7	450	0.01		0.032	0.93	0.05	1.9	0.088	0.056	7.22	17.6	635	5.0	21.0
8:15	JULY 20	750	0.01	490	0.010	0.77	0.06	1.2	0.103	0.073	7.86	19.7	602	5.0	18.5
8:20	AUG 4	1500	56	1000											17.0
8:20	AUG 17	1000	0.01	100	0.165	1.70	0.03	0.2	0.270	0.071	7.66	15.9	537	9.6	19.5
8:10	AUG 31	3500	8	1200	0.015	1.14	0.03	0.3	0.205	0.111	7.83	19.4	515	7.3	23.0
8:20	+SEPT 14	7600	8	1100	1.030	2.60	0.09	1.3	0.480	0.290	7.94	28.8	786	6.6	20.5
8:20	+SEPT 28	30000	32	19000											10.0
8:25	OCT12	250	0.01	300	0.086	0.68	0.02	5.4	0.067	0.054	7.94	22.7	670	38.9	12.5
8:25	OCT 26	150	0.01	110	0.081	0.60	0.02	5.6	0.054	0.019	7.99	21.5	768	50.7	13.0
	minimum	150	0.01	100	0.010	0.6	0.02	0.2	0.054	0.019	7.50	12.5	515	5.0	10.0
	maximum	30000	56	19000	1.030	2.6	0.1	11.9	0.480	0.290	7.99	28.8	786	50.7	23.0
	average	4274	12.73	2530	0.18	1.2	0.05	3.156	0.170	0.100	7.80	19.4	631	15.1	16.6
	Geo.Mean	1194	0.32	726	0.07	1.1	0.04	1.5	0.13						
	S.D.			6106				4.2	0.14						

+ represents wet weather samples

DRY WEATHER SAMPLES

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
8:20	JUNE 7	310	0.01	1000	0.120	1.05	0.06	0.6	0.081	0.045	7.82	16.3	585	5.0	13.0
8:50	JUNE 22	1500	36	1000	0.072	1.22	0.10	11.9	0.186	0.140	7.50	12.5	581	7.8	14.5
8:10	JULY 7	450	0.01		0.032	0.93	0.05	1.9	0.088	0.056	7.82	17.6	635	5.0	21.0
8:15	JULY 20	750	0.01	490	0.010	0.77	0.06	1.2	0.103	0.073	7.86	19.7	602	5.0	18.5
8:20	AUG 4	1500	56	1000											17.0
8:20	AUG 17	1000	0.01	100	0.165	1.70	0.03	0.2	0.270	0.071	7.66	15.9	537	9.6	19.5
8:10	AUG 31	3500	8	1200	0.015	1.14	0.03	0.3	0.205	0.111	7.83	19.4	515	7.3	23.0
8:25	OCT 12	250	0.01	300	0.086	0.68	0.02	5.4	0.067	0.054	7.94	22.7	670	38.9	12.5
8:25	OCT 26	150	0.01	110	0.081	0.60	0.02	5.6	0.054	0.019	7.99	21.5	768	50.7	13.0
	minimum	150	0.01	100	0.010	0.6	0.02	0.2	0.054	0.019	7.50	12.5	515	5.0	12.5
	maximum	3500	56	1200	0.165	1.7	0.1	11.9	0.270	0.140	7.99	22.7	768	50.7	23.0
	average	1046	11.12	650	0.070	1.0	0.05	3.4	0.130	0.070	7.80	18.2	612	16.2	16.889
	Geo.Mean	680	0.136	458	0.050	1.0	0.04	1.5	0.110						
	S.D.			494				4.5	0.080						

1993 CURB PROGRAM WATER QUALITY DATA

STATION B-18

This site is at Tony Emond's farm at L1 2 C16 Elma Township, sampling from the tile discharging to the municipal drain.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
9:05	JUNE 7	27000	280	32000	0.470	69.50	0.22	0.3	22.000	14.300	5.54	101.0	1110	692.0	11.0
9:10	JUNE 22	31000	148	89000	0.164	8.60	0.03	0.1	1.660	0.420	7.05	16.0	811	54.1	16.0
8:25	JULY 7	300	0.01	360000	5.520		0.27	0.5	2.920	2.740	7.62	57.2	960	5.0	19.5
8:35	JULY 20	1500	0.01	2300											17.0
8:35	AUG 4	12800	36	7700	0.059	2.01	0.38	5.5	0.770	0.620	7.26	21.4	558	14.3	16.0
8:35	AUG 17	700	32	3500	0.048	4.44	0.09	5.6	1.360	0.990	7.74	36.6	762	17.0	20.0
8:30	AUG 31	25500	64	16000	0.016	3.20	0.24	7.5	1.240	1.030	7.70	18.8	495	26.3	22.0
8:30	SEPT 14	1200	0.01	1300	5.160	8.80	0.68	5.9	1.980	1.550	7.89	30.8	1025	8.9	17.0
8:40	+SEPT 28	170000	88	410000	0.830	4.37	0.15	10.9	1.520	1.100	7.28	19.6	725	40.9	13.0
8:40	OCT 12	210	176	240000	16.100		0.68	6.6	4.800	4.530	7.62	45.5	1245	11.4	15.0
8:40	OCT 26	8900	164	120000	12.100	16.50	0.58	7.6	4.100	2.700	7.73	35.1	1089	6.8	11.5
	minimum	210	0.01	1300	0.016	2.01	0.03	0.1	0.770	0.42	5.54	16	495	5.0	11.0
	maximum	170000	280	410000	16.100	69.5	0.68	10.9	22.000	14.3	7.89	101	1245	692	22.0
	average	25374	89.82	116527	4.05	14.7	0.33	5.05	4.24	3.00	7.30	38.2	878	87.7	162
	Geo.Mean	4823	7.93	29657	0.66	7.6	0.24	2.5	2.46						
	S.D.			176812				4.5	6.65						

+ represents wet weather samples

DRY WEATHER SAMPLES

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
9:05	JUNE 7	27000	280	32000	0.470	69.50	0.22	0.3	22.000	14.300	5.54	101.0	1110	692.0	11.0
9:10	JUNE 22	31000	148	89000	0.164	8.60	0.03	0.1	1.660	0.420	7.05	16.0	811	54.1	16.0
8:25	JULY 7	300	0.01	360000	5.520		0.27	0.5	2.920	2.740	7.62	57.2	960	5.0	19.5
8:35	JULY 20	1500	0.01	2300											17.0
8:35	AUG 4	12800	36	7700	0.059	2.01	0.38	5.5	0.770	0.620	7.26	21.4	558	14.3	16.0
8:35	AUG 17	700	32	3500	0.048	4.44	0.09	5.6	1.360	0.990	7.74	36.6	762	17.0	20.0
8:30	AUG 31	25500	64	16000	0.016	3.20	024	7.5	1 240	1.030	7.70	18.8	495	26.3	22.0
8:20	SEPT 14	1200	0.01	1300	5.160	8.80	0.68	5.9	1.980	1.550	7.89	30.8	1025	8.9	17.0
8:40	OCT 12	210	176	240000	16.100		0.68	6.6	4.800	4.530	7.62	45.5	1245	11.4	15.0
8:40	OCT 26	8900	164	120000	12.100	16.50	0.58	7.6	4.100	2.700	7.73	35.1	1089	6.8	11.5
	minimum	210	0.01	1300	0.016	2.01	0.03	0.1	0.770	0.42	5.54	16	495	5.0	11.0
	maximum	31000	280	360000	16.100	69.5	0.68	7.6	22.000	14.3	7.89	101	1245	692	22.0
	average	10911	90	87180	4.40	162	0.35	4.4	4.54	3.21	7.40	40.3	895	92.9	16.5
	Geo.Mean	3377	6.231	22806	0.65	8.2	0.25	2.2	2.60						
	S.D.			139966				4.0	7.00						

1993 CURB PROGRAM WATER QUALITY DATA
STATION B-21

This is the downstream sampling point at Tony Emond's at L15 C2 Elma Township.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
9:15	JUNE 22	240000	20	1100	0.167	1.58	0.15	17.4	0.385	0.196	7.25	9.2	653	8.8	16.0
8:30	JULY 7	700	0.01	510000	0.730	1.18	0.17	1.1	0.300	0.199	7.73	15.6	667	5.0	19.5
8:40	JULY 20	1430	0.01	2400	0.005	1.50	0.11	1.0	0.900	0.270	7.55	29.1	701	103.0	17.0
8:40	AUG 4	3400	4	2000	0.089	1.01	0.05	0.5	0.345	0.173	7.70	32.3	666	9.7	17.0
8:35	SEPT 14	410	184	2400	0.351	1.48	0.18	7.8	0.195	0.177	7.83	43.1	961	12.5	21.0
8:45	+SEPT 28	88000	52	280000	0.170	2.14	0.05	14.9	0.560	0.360	7.30	19.8	645	39.9	12.5
8:45	OCT 12	100	0.01	100	0.048	0.58	0.01	11.0	0.035	0.022	7.60	12.8	810	5.0	12.0
8:45	OCT 26	560	0.01	1000	0.124	0.67	0.25	10.2	0.124	0.022	7.99	17.1	810	8.2	14.0
	minimum	100	0.01	100	0.005	0.58	0.01	0.5	0.035	0.022	7.25	9.2	645	5.0	12.0
	maximum	240000	184	510000	0.730	2.14	0.25	17.4	0.900	0.36	7.99	43.1	961	103	21.0
	average	41825	32.51	99875	0.21	1.3	0.12	7.988	0.36	0.18	7.60	22.4	739	24.0	16.1
	Geo.Mean	2525	0.54	4541	0.11	1.2	0.09	4.3	0.25						
	S.D.			217592				7.6	0.29						

+ represents wet weather samples

DRY WEATHER SAMPLES

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
9:15	JUNE 22	240000	20	1100	0.167	1.58	0.15	17.4	0.385	0.196	7.25	9.2	653	8.8	16.0
8:30	JULY 7	700	0.01	510000	0.730	1.18	0.17	1.1	0.300	0.199	7.73	15.6	667	5.0	19.5
8:40	JULY 20	1430	0.01	2400	0.005	1.50	0.11	1.0	0.900	0.270	7.55	29.1	701	103.0	17.0
8:40	AUG 4	3400	4	2000	0.089	1.01	0.05	0.5	0.345	0.173	7.70	32.3	666	9.7	17.0
8:35	SEPT 14	410	184	2400	0.351	1.48	0.18	7.8	0.195	0.177	7.83	43.1	961	12.5	21.0
8:45	OCT 12	100	0.01	100	0.048	0.58	0.01	11.0	0.035	0.022	7.60	12.8	810	5.0	12.0
8:45	OCT 26	560	0.01	1000	0.124	0.67	0.25	10.2	0.124	0.022	7.99	17.1	810	8.2	14.0
	minimum	100	0.01	100	0.005	0.58	0.01	0.5	0.035	0.022	7.25	9.2	653	5.0	12.0
	maximum	240000	184	510000	0.730	1.58	0.25	17.4	0.900	0.27	7.99	43.1	961	103	21.0
	average	35229	29.72	74143	0.22	1.1	0.13	7.0	0.33	0.15	7.70	22.7	753	21.7	16.643
	Geo.Mean	1520	0.284	2521	0.10	1.1	0.09	3.6	0.23						
	S.D.			207182				7.4	0.30						

1993 CURB PROGRAM WATER QUALITY DATA
STATION B-22

This is the upstream sampling point at Tony Emond's at L15 C2 Elma Township.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
9:20	JUNE 22	1500	0.01	1000	0.047	1.38	0.15	18.4	0.245	0.189	7.31	7.9	652	5.0	18.0
8:30	JULY 7	900	0.01	31000	0.640	1.56	0.21	2.1	0.166	0.106	7.58	13.4	681	5.0	19.5
8:45	JULY 20	960	0.01	150											17.0
8:40	AUG 4	1000	0.01	490	0.011	0.96	0.01	0.1	0.147	0.030	7.27	34.2	717	20.3	17.0
8:40	SEPT 14	310	208	430	0.096	1.12	0.14	9.0	0.122	0.083	7.65	22.5	923	4.7	21.0
8:50	+SEPT 28	93000	48	250000	0.110	2.61	0.05	15.4	0.570	0.310	7.31	11.2	611	58.6	12.5
8:50	OCT 12	300	4	700	0.063	0.70	0.03	11.0	0.053	0.051	7.63	17.4	823	5.0	12.0
8:50	OCT 26	40	0.01	100	0.031	0.54	0.05	10.5	0.031	0.002	7.75	13.1	803	32.9	14.0
	minimum	40	0.01	100	0.011	0.54	0.01	0.1	0.031	0.002	7.27	7.9	611	4.7	12.0
	maximum	93000	208	250000	0.640	2.61	0.21	18.4	0.570	0.31	7.75	34.2	923	58.6	21.0
	average	12251	32.51	35484	0.14	1.3	0.09	9.5	0.19	0.11	7.5	17.1	744	18.8	16.4
	Geo.Mean	905	0.21	1426	0.07	1.1	0.06	4.8	0.13						
	S.D.			94619				8.3	0.19						

+ represents wet weather samples

DRY WEATHER SAMPLES

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
9:20	JUNE 22	1500	0.01	1000	0.047	1.38	0.15	18.4	0.245	0.189	7.31	7.9	652	5.0	18.0
8:30	JULY 7	900	0.01	31000	0.640	1.56	0.21	2.1	0.166	0.106	7.58	13.4	681	5.0	19.5
8:45	JULY 20	960	0.01	150											17.0
8:40	AUG 4	1000	0.01	490	0.011	0.96	0.01	0.1	0.147	0.030	7.27	34.2	717	20.3	17.0
8:40	SEPT 14	310	208	430	0.096	1.12	0.14	9.0	0.122	0.083	7.65	22.5	923	4.7	21.0
8:50	OCT 12	300	4	700	0.063	0.70	0.03	11.0	0.053	0.051	7.63	17.4	823	5.0	12.0
8:50	OCT 26	40	0.01	100	0.031	0.54	0.05	10.5	0.031	0.002	7.75	13.1	803	32.9	14.0
	minimum	40	0.01	100	0.011	0.54	0.01	0.1	0.031	0.002	7.27	7.9	652	4.7	12.0
	maximum	1500	208	31000	0.640	1.56	0.21	18.4	0.245	0.189	7.75	34.2	923	32.9	21.0
	average	716	30.29	4839	0.15	1.0	0.10	8.5	0.13	0.08	7.50	18.1	767	12.2	16.929
	Geo.Mean	467	0.097	682	0.06	1.0	0.06	4.0	0.10						
	S.D.			12383				8.5	0.09						

1993 CURB PROGRAM WATER QUALITY DATA
STATION B-16

This site is at the tile outlet at L10 C16 Elma Township.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
9:10	JUNE 7	390	0.01	220	1.100	1.21	0.13	5.6	0.115	0.054	7.04	54.4	871	7.0	9.0
9:25	JUNE 22	890	0.01	540	0218	1.02	0.07	4.5	0.073	0.052	7.12	12.6	722	5.0	14.0
8:55	JULY 7	140	0.01	200	2.310	2.35	0.09	3.3	0.057	0.013	6.99	74.6	1171	7.8	15.0
8:55	JULY 20	610	16	680											15.0
8:45	AUG 4	1500	40	1000	1.890	2.00	0.11	3.7	0.143	0.037	7.15	43.1	926	10.0	16.0
8:50	AUG 17	670	4	340	2.310	3.80	0.07	2.6	0.051	0.006	7.06	71.3	1175	6.0	16.0
8:40	AUG 31	1000	296	1000											21.0
8:50	SEPT 14	80	0.01	30	3.170	5.20	0.10	2.8	0.048	0.019	7.18	60.0	1216	4.1	21.0
8:55	+SEPT 28	41000	60	5400	0.120	1.19	0.01	3.1	0.220	0.140	7.07	10.7	652	7.9	11.0
855	OCT 12	100	0.01	100	0.480	1.41	0.04	26	0.038	0.016	7.61		862		13.0
8:55	OCT 26	32	0.01	0.01	0.093	0.66	0.02	1.7	0.021	0.008	7.44	24.4	816	29.2	13.5
	minimum	32	0.01	0.01	0.093	0.66	0.01	1.7	0.021	0.006	6.99	10.7	652	4.1	9.0
	maximum	41000	296	5400	3.170	52	0.13	5.6	0.220	0.14	7.61	74.6	1216	29.2	21.0
	average	4219	37.82	865	1.30	2.1	0.07	3.3	0.09	0.04	7.20	43.9	935	9.6	15.0
	Geo.Mean	480	0.40	150	0.70	1.7	0.06	3.2	0.07						
	S.D.			1718				1.2	0.07						

+ represents wet weather samples

DRY WEATHER
SAMPLES

The	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
9:10	JUNE 7	390	0.01	220	1.100	1.21	0.13	5.6	0.115	0.054	7.04	54.4	871	7.0	9.0
9:25	JUNE 22	890	0.01	540	0.218	1.02	0.07	4.5	0.073	0.052	7.12	12.6	722	5.0	14.0
8:55	JULY 7	140	0.01	200	2.310	2.35	0.09	3.3	0.057	0.013	6.99	74.6	1171	7.8	15.0
8:55	JULY 20	610	16	680											15.0
8:45	AUG 4	1500	40	1000	1.890	2.00	0.11	3.7	0.143	0.037	7.15	43.1	926	10.0	16.0
8:50	AUG 17	670	4	340	2.310	3.80	0.07	2.6	0.051	0.006	7.06	71.3	1175	6.0	16.0
8:40	AUG 31	1000	296	1000											21.0
8:50	SEPT 14	80	0.01	30	3.170	5.20	0.10	2.8	0.048	0.019	7.18	60.0	1216	4.1	21.0
8:55	OCT 12	100	0.01	100	0.480	1.41	0.04	2.6	0.038	0.016	7.61		862		13.0
8:55	OCT 26	32	0.01	0.01	0.093	0.66	0.02	1.7	0.021	0.008	7.44	24.4	816	29.2	13.5
	minimum	32	0.01	0.01	0.093	0.66	0.02	1.7	0.021	0.006	6.99	12.6	722	4.1	9.0
	maximum	1500	296	1000	3.170	5.2	0.13	5.6	0.143	0.054	7.61	74.6	1216	29.2	21.0
	average	541	35.61	411	1.45	2.2	0.08	3.4	0.07	0.03	7.20	48.6	970	9.9	15.4
	Geo.Mean	308	0.244	105	0.87	1.8	0.07	3.2	0.06						
	S.D.			496				1.3	0.04						

1993 CURB PROGRAM WATER QUALITY DATA

STATION B-19

This is Carl Bolton's downstream sampling site at 114 C9 McKillop Twp on the Barron Municipal Drain.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
9:40	JUNE 7	220	0.01	170	0.064	0.67	0.10	5.8	0.027	0.007	8.13	12.3	524	5.0	15.5
9:50	JUNE 22	1500	8	4500	0.062	0.87	0.10	20.4	0.134	0.091	7.68	12.7	627	13.1	15.0
9:25	JULY 7	100	0.01	1600	0.046	0.60	0.13	8.4	0.034	0.001	8.04	14.3	564	9.4	22.5
9:20	JULY 20	1500	8	1000											19.5
9:10	AUG 4	2400	0.01	9000	0.032	0.79	0.06	1.4	0.066	0.011	7.87	12.3	422	18.7	17.0
9:25	AUG 17	950	0.01	2100	0.065	0.98	0.03	0.2	0.080	0.013	7.83	11.3	423	13.4	21.0
9:10	AUG 31	6400	64	1000	0.043	0.94	0.15	2.0	0.078	0.010	8.24	14.0	449	31.4	23.0
9:25	SEPT 14	770	4	3400	0.005	0.60	0.06	4.9	0.070	0.020	8.18	16.7	594	32.7	22.0
9:30	+SEPT 28	33000	96	38000	0.060	0.98	0.04	7.2	0.300	0.130	7.60	11.2	509	430.0	12.0
9:20	OCT 12	180	0.01	180	0.038	0.49	0.01	7.7	0.027	0.004	7.95	14.9	640	101.0	13.0
9:25	OCT 26	192	0.01	20	0.030	0.38	0.01	7.1	0.017	0.001	7.95	14.0	665	55.1	13.0
	minimum	100	0.01	20	0.005	0.38	0.01	0.2	0.017	0.001	7.60	11.2	422	5.0	12.0
	maximum	33000	96	38000	0.065	0.98	0.15	20.4	0.300	0.13	8.24	16.7	665	430	23.0
	average	4292	16.37	5543	0.04	0.7	0.07	6.51	0.08	0.03	7.90	13.4	542	71.0	17.6
	Geo.Mean	959	0.30	1241	0.04	0.7	0.05	4.0	0.06						
	S.D.			11964				6.2	0.09						

+ represents wet weather samples

DRY WEATHER SAMPLES

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
9:40	JUNE 7	220	0.01	170	0.064	0.67	0.10	5.8	0.027	0.007	8.13	12.3	524	5.0	15.5
9:50	JUNE 22	1500	8	4500	0.062	0.87	0.10	20.4	0.134	0.091	7.68	12.7	627	13.1	15.0
9:25	JULY 7	100	0.01	1600	0.046	0.60	0.13	8.4	0.034	0.001	8.04	14.3	564	9.4	22.5
9:30	JULY 20	1500	8	1000											19.5
9:10	AUG 4	2400	0.01	9000	0.032	0.79	0.06	1.4	0.066	0.011	7.87	12.3	422	18.7	17.0
9:25	AUG 17	950	0.01	2100	0.065	0.98	0.03	0.2	0.080	0.013	7.83	11.3	423	13.4	21.0
9:10	AUG 31	6400	64	1000	0.043	0.94	0.15	2.0	0.078	0.010	8.24	14.0	449	31.4	23.0
9:25	SEPT 14	770	4	3400	0.005	0.60	0.06	4.9	0.070	0.020	8.18	16.7	594	32.7	22.0
9:30	OCT 12	180	0.01	180	0.038	0.49	0.01	7.7	0.027	0.004	7.95	14.9	640	101.0	13.0
9:25	OCT 26	192	0.01	20	0.030	0.38	0.01	7.1	0.017	0.001	7.95	14.0	665	55.1	13.0
	minimum	100	0.01	20	0.005	0.38	0.01	0.2	0.017	0.001	7.68	11.3	422	5.0	13.0
	maximum	6400	64	9000	0.065	0.98	0.15	20.4	0.134	0.091	8.24	16.7	665	101.0	23.0
	average	1421	8.41	2297	0.04	0.7	0.07	6.4	0.06	0.02	8.00	13.6	545	31.1	18.15
	Geo.Mean	674	0.17	881	0.04	0.7	0.05	3.8	0.05						
	S.D.			3147				6.6	0.04						

1993 CURB PROGRAM WATER QUALITY DATA

STATION B-20

This is Carl Bolton's upstream sampling site at L14 C9 McKillop Twp on the Barron Municipal Drain.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
9:55	JUNE 7	160	0.01	210	0.051	0.65	0.10	5.8	0.029	0.010	8.01	12.0	531	5.0	15.5
9:55	JUNE 22	1500	8	1000	0.027	0.90	0.10	19.4	0.125	0.089	7.65	12.5	628	10.5	15.0
9:25	JULY 7	300	0.01	3900	0.037	0.59	0.11	9.3	0.030	0.002	7.77	14.1	555	5.0	22.5
9:40	JULY 20	930	4	550											19.5
9:20	AUG 4	960	0.01	700	0.036	0.70	0.04	2.9	0.031	0.007	7.81	11.8	395	11.0	17.0
9:35	AUG 17	510	0.01	180	0.051	0.74	0.03	1.3	0.032	0.001	7.85	11.4	451	8.3	21.0
9:20	AUG 31	3300	8	700	0.019	0.96	0.19	3.2	0.080	0.010	8.13	12.0	497	53.5	23.0
9:35	SEPT 14	680	8	300	0.011	0.54	0.05	5.0	0.073	0.030	8.32	16.6	608	19.0	22.0
9:40	+SEPT 28	31000	112	30000	0.090	0.97	0.04	6.8	0.300	0.130	7.57	11.2	515	361.0	12.0
9:40	OCT 12	220	0.01	50	0.017	0.56	0.01	7.8	0.022	0.001	8.03	15.0	679	58.6	13.0
9:20	OCT 26	20	0.01	10	0.021	0.38	0.01	7.2	0.017	0.001	8.05	14.4	659	61.9	13.0
	minimum	20	0.01	10	0.011	028	0.01	1.3	0.017	0.001	7.57	11.2	395	5.0	12.0
	maximum	31000	112	30000	0.090	0.97	0.19	19.4	0.300	0.13	8.32	16.6	679	361.0	23.0
	average	3598	12.73	3418	0.04	0.7	0.07	6.87	0.07	0.03	7.90	13.1	552	59.4	17.6
	Geo.Mean	658	0.25	456	0.03	0.7	0.05	5.5	0.05						
	S.D.			9411				5.3	0.09						

+ represents wet weather samples

DRY WEATHER SAMPLES

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
9:55	JUNE 7	160	0.01	210	0.051	0.65	0.10	5.8	0.029	0.010	8.01	12.0	531	5.0	15.5
9:55	JUNE 22	1500	8	1000	0.027	0.90	0.10	19.4	0.125	0.089	7.65	12.5	628	10.5	15.0
9:35	JULY 7	300	0.01	3900	0.037	0.59	0.11	9.3	0.030	0.002	7.77	14.1	555	5.0	22.5
9:40	JULY 20	930	4	550											19.5
9:20	AUG 4	960	0.01	700	0.036	0.70	0.04	2.9	0.031	0.007	7.81	11.8	395	11.0	17.0
9:35	AUG 17	510	0.01	180	0.051	0.74	0.03	1.3	0.032	0.001	7.85	11.4	451	8.3	21.0
9:20	AUG 31	3300	8	700	0.019	0.96	0.19	3.2	0.080	0.010	8.13	12.0	497	53.5	23.0
9:25	SEPT 14	680	8	300	0.011	0.54	0.05	5.0	0.073	0.030	8.32	16.6	608	19.0	22.0
9:40	OCT 12	220	0.01	50	0.017	0.56	0.01	7.8	0.022	0.001	8.03	15.0	679	58.6	13.0
9:30	OCT 26	20	0.01	10	0.021	0.38	0.01	7.2	0.017	0.001	8.05	14.4	659	61.9	13.0
	minimum	20	0.01	10	0.011	0.38	0.01	1.3	0.017	0.001	7.65	11.4	395	5.0	13.0
	maximum	3300	8	3900	0.051	0.96	0.19	19.4	0.125	0.089	8.32	16.6	679	61.9	23.0
	average	858	2.81	760	0.03	0.7	0.07	6.9	0.05	0.02	8.00	13.3	556	25.9	18.15
	Geo.Mean	448	0.14	300	0.03	0.6	0.05	5.3	0.04						
	S.D.			1247				5.6	0.04						

1993 CURB PROGRAM WATER QUALITY DATA
STATION D-160

This site is the Beauchamp Drain at L6 C14 Grey Twp.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
9:25	JUNE 7	220	0.01	170	0.048	0.85	0.02	1.5	0.034	0.009	8.11	9.9	504	5.0	15.0
9:25	JUNE 22	1500	28	1000	0.080	1.34	0.15	17.4	0.153	0.112	7.53	11.9	531	13.2	16.5
9:10	JULY 7	100	0.01	150	0.058	1.01	0.04	2.5	0.037	0.001	7.98	12.3	555	7.3	22.5
9:15	JULY 20	700	0.01	1000											19.0
9:05	AUG 4	1300	4	850	0.005	0.94	0.03	2.2	0.037	0.002	7.85	13.6	482	8.4	17.0
9:10	AUG 17	240	0.01	130	0.072	0.85	0.02	0.9	0.031	0.001	7.84	10.2	459	5.0	19.0
8:55	AUG 31	170	0.01	260											22.0
9:10	SEPT 14	310	0.01	280	0.020	1.04	0.04	2.8	0.029	0.006	8.26	20.8	639	3.3	21.0
9:10	+SEPT 28	7700	8	210	0.030	0.92	0.01	2.9	0.060	0.030	7.92	15.2	598	17.3	11.0
9:10	OCT 12	220	0.01	200			0.02	5.3			8.26		722		11.5
9:05	OCT 26	100	8	76	0.093	0.66	0.02	1.7	0.021	0.008	7.44	24.4	816	292	11.5
	minimum	100	0.01	76	0.005	0.66	0.01	0.9	0.021	0.001	7.44	9.9	459	3.3	11.0
	maximum	7700	28	1000	0.093	1.34	0.15	17.4	0.153	0.112	8.26	24.4	816	292	22.5
	average	1142	4.37	393	0.05	1.0	0.04	4.133	0.05	0.02	7.90	14.8	590	11.1	16.9
	Geo.Mean	416	0.12	274	0.04	0.9	0.03	2.5	0.04						
	S.D.			385				5.4	0.04						

+ represents wet weather samples

DRY WEATHER SAMPLES

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
9:25	JUNE 7	220	0.01	170	0.048	0.85	0.02	1.5	0.034	0.009	8.11	9.9	504	5.0	15.0
9:25	JUNE 22	1500	28	1000	0.080	1.34	0.15	17.4	0.153	0.112	7.53	11.9	531	132	16.5
9:10	JULY 7	100	0.01	150	0.058	1.01	0.04	2.5	0.037	0.001	7.98	12.3	555	7.3	22.5
9:15	JULY 20	700	0.01	1000											19.0
9:05	AUG 4	1300	4	850	0.005	0.94	0.03	2.2	0.037	0.002	7.85	13.6	482	8.4	17.0
9:10	AUG 17	240	0.01	130	0.072	0.85	0.02	0.9	0.031	0.001	7.84	10.2	459	5.0	19.0
8:55	AUG 31	170	0.01	260											22.0
9:10	SEPT 14	310	0.01	280	0.020	1.04	0.04	2.8	0.029	0.006	8.26	20.8	639	3.3	21.0
9:10	OCT 12	220	0.01	200			0.02	5.3			8.26		722		11.5
9:05	OCT 26	100	8	76	0.093	0.66	0.02	1.7	0.021	0.008	7.44	24.4	816	29.2	11.5
	minimum	100	0.01	76	0.005	0.66	0.02	0.9	0.021	0.001	7.44	9.9	459	3.3	11.5
	maximum	1500	28	1000	0.093	1.34	0.15	17.4	0.153	0.112	8.26	24.4	816	29.2	22.5
	average	486	4.01	412	0.05	1.0	0.04	4.3	0.05	0.02	7.90	14.7	589	10.2	17.5
	Geo.Mean	311	0.079	281	0.04	0.9	0.03	2.5	0.04						
	S.D.			402				5.8	0.05						

1993 CURB PROGRAM WATER QUALITY DATA
STATION D-230

This is the sampling site on the Blyth Brook at Walkerburn (L39 C13 Hullett Twp.)

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
10:15	JUNE 7	200	0.01	220	0.016	0.64	0.03	3.5	0.015	0.003	8.35	10.9	544	5.0	15.0
10:20	JUNE 22	910	0.01	1000	0.005	1.12	0.06	9.7	0.076	0.025	8.09	11.5	596	17.1	16.0
10:00	JULY 7	240	0.01	1500	0.028	0.73	0.03	4.3	0.021	0.001	8.24	12.2	556	5.0	22.0
10:00	JULY20	1010	16	1000											19.0
9:50	AUG 4	2600	4	2600	0.005	0.98	0.02	2.9	0.116	0.006	8.13	11.5	523	69.6	18.0
9:55	AUG 17	490	0.01	380	0.018	0.67	0.02	2.7	0.029	0.001	8.15	11.6	531	5.0	20.0
9:45	AUG 31	450	0.01	310	0.013	0.60	0.02	2.7	0.020	0.004	8.14	14.0	533	5.0	21.5
9:50	SEPT 14	140	0.01	330	0.013	0.67	0.02	3.0	0.030	0.007	8.27	11.8	536	2.8	23.0
10:10	+SEPT 28	31000	60	16000	0.060	1.65	0.03	3.5	0.310	0.080	7.89	12.3	504	157.0	11.0
9:55	OCT 12	150	0.01	220	0.008	0.54	0.01	3.6	0.013	0.001	8.13	14.9	616	21.6	13.5
9:55	OCT 26	80	0.01	30	0.012	0.54	0.01	4.3	0.013	0.001	8.21	15.0	644	102	15.0
	minimum	80	0.01	30	0.005		0.01	2.7	0.013	0.001	7.89	10.9	504	2.8	11.0
	maximum	31000	60	16000	0.060	1.65	0.06	9.7	0.310	0.08	8.35	15.0	644	157.0	23.0
	average	3388	7.28	2145	0.02	0.8	0.03	4.0	0.06	0.01	8.20	12.6	558	29.8	17.6
	Geo.Mean	547	0.07	598	0.01	0.8	0.02	3.7	0.03						
	S.D.			4931				2.1	0.10						

+ represents wet weather samples

DRY WEATHER SAMPLES

The	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
10:15	JUNE 7	200	0.01	220	0.016	0.64	0.03	3.5	0.015	0.003	8.35	10.9	544	5.0	15.0
10:20	JUNE 22	910	0.01	1000	0.005	1.12	0.06	9.7	0.076	0.025	8.09	11.5	596	17.1	16.0
10:00	JULY 7	240	0.01	1500	0.028	0.73	0.03	4.3	0.021	0.001	8.24	12.2	556	5.0	22.0
10:00	JULY20	1010	16	1000											19.0
9:50	AUG 4	2600	4	2600	0.005	0.98	0.02	2.9	0.116	0.006	8.13	11.5	523	69.6	18.0
9:55	AUG 17	490	0.01	380	0.018	0.67	0.02	2.7	0.029	0.001	8.15	11.6	531	5.0	20.0
9:45	AUG 31	450	0.01	310	0.013	0.60	0.02	2.7	0.020	0.004	8.14	14.0	533	5.0	21.5
9:50	SEPT 14	140	0.01	330	0.013	0.67	0.02	3.0	0.030	0.007	8.27	11.8	536	2.8	23.0
9:55	OCT 12	150	0.01	220	0.008	0.54	0.01	3.6	0.013	0.001	8.13	14.9	616	21.6	13.5
9:55	OCT 26	80	0.01	30	0.012	0.54	0.01	4.3	0.013	0.001	8.21	15.0	644	10.2	15.0
	minimum	80	0.01	30	0.005	0.54	0.01	2.7	0.013	0.001	8.09	10.9	523	2.8	13.5
	maximum	2600	16	2600	0.028	1.12	0.06	9.7	0.116	0.025	8.35	15	644	69.6	23.0
	average	627	2.01	759	0.01	0.7	0.02	4.1	0.04	0.01	8.20	12.6	564	15.7	18.3
	Geo.Mean	365	0.04	431	0.01	0.7	0.02	3.7	0.03						
	S.D.			868				2.2	0.04						

1993 CURB PROGRAM WATER QUALITY DATA

STATION B-5

This sample is taken beside Huron County Road 27 at L2829 C2 East Wawanosh Two. downstream of Emma Franken's manure storage.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
10:25	JUNE 7	290	12	210	0.205	0.69	0.05	5.2	0.103	0.099	7.98	15.7	646	24.7	15.0
10:20	JUNE 22	910	4	1000	0.084	1.41	0.12	9.9	0.174	0.117	7.58	9.6	549	11.6	16.0
10:10	JULY 7	60	0.01	100	0.326	2.26	0.17	8.6	0.330	0.116	7.76	13.8	687	20.5	20.0
10:15	JULY 20	1500	196	1000											12.0
10:05	AUG 4	3800	10	2200	0.149	1.28	0.20	7.6	0.196	0.065	7.81	13.0	655	18.7	18.0
10:05	AUG 17	200	16	580	0.199	1.31	0.19	7.6	0.108	0.005	7.82	11.5	648	9.4	18.0
10:00	AUG 31	150	0.01	100	0.010	1.11	0.26	6.6	0.085	0.046	7.85	12.1	639	7.9	23.0
10:05	SEPT 14	220	12	3100	0.085	1.02	0.17	5.2	0.330	0.200	8.04	20.6	683	4.5	23.0
10:20	+SEPT 28	58000	0.01	37000	0.070	1.45	0.04	3.3	0.620	0.420	7.50	9.6	412	40.3	11.0
10:05	OCT 12	150	0.01	660	0.060	0.65	0.06	6.9	0.061	0.035	7.78	15.9	696	31.1	13.0
10:05	OCT 26	90	0.01	20	0.020	0.67	0.04	6.3	0.064	0.022	7.88	12.1	661	6.9	14.5
	minimum	60	0.01	20	0.010	0.65	0.04	3.3	0.061	0.005	7.50	9.6	412	4.5	11.0
	maximum	58000	196	37000	0.326	226	0.26	9.9	0.620	0.420	8.04	20.6	696	40.3	23.0
	average	5943	22.73	4179	0.12	1.2	0.13	6.7	021	0.11	7.80	13.4	628	17.6	16.7
	Geo.Mean	498	0.56	606	0.08	1.1	0.11	6.5	0.16						
	S.D.			11552				1.9	0.18						

+ represents wet weather samples

DRY WEATHER SAMPLES

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
10:25	JUNE 7	290	12	210	0.205	0.69	0.05	5.2	0.103	0.099	7.98	15.7	646	24.7	15.0
10:30	JUNE 22	910	4	1000	0.084	1.41	0.12	9.9	0.174	0.117	7.58	9.6	549	11.6	16.0
10:10	JULY 7	60	0.01	100	0.326	226	0.17	8.6	0.330	0.116	7.76	13.8	687	20.5	20.0
10:15	JULY 20	1500	196	1000											12.0
10:05	AUG 4	3800	10	2200	0.149	1.28	0.20	7.6	0.196	0.065	7.81	13.0	655	18.7	18.0
10:05	AUG 17	200	16	580	0.199	1.31	0.19	7.6	0.108	0.005	7.82	11.5	648	9.4	18.0
10:00	AUG 31	150	0.01	100	0.010	1.11	0.26	6.6	0.085	0.046	7.85	12.1	639	7.9	23.0
10:05	SEPT 14	220	12	3100	0.085	1.02	0.17	5.2	0.330	0.200	8.04	20.6	683	4.5	23.0
10:05	OCT 12	150	0.01	660	0.060	0.65	0.06	6.9	0.061	0.035	7.78	15.9	696	31.1	13.0
10:05	OCT 26	90	0.01	20	0.020	0.67	0.04	6.3	0.064	0.022	7.88	12.1	661	6.9	14.5
	minimum	60	0.01	20	0.010	0.65	0.04	5.2	0.061	0.005	7.58	9.6	549	4.5	12.0
	maximum	3800	196	3100	0.326	226	0.26	9.9	0.330	0.200	8.04	20.6	696	31.1	23.0
	average	737	25.00	897	0.13	1.2	0.14	7.1	0.16	0.08	7.80	13.8	652	15.0	17.3
	Geo.Mean	309	0.84	402	0.08	1.1	0.12	7.0	0.13						
	S.D.			1140				1.5	0.11						

1993 CURB PROGRAM WATER QUALITY DATA
STATION B-8

This sampling site is at L25 C6 West Wawanosh Twp., on the St. Augustine Creek, just south of Robinson's sugar shack.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
10:25	JUNE 7	110	0.01	170	0.020	0.71	0.01	0.7	0.029	0.007	7.97	5.0	464	5.4	14.0
10:40	JUNE 22	260	0.01	330	0.005	0.81	0.03	0.7	0.027	0.011	7.78	3.5	435	4.1	18.0
10:20	JULY 7	160	0.01	540	0.112	0.90	0.01	0.4	0.043	0.001	7.73	5.7	493	6.7	21.0
10:25	JULY 20	470	0.01	410											19.5
10:15	AUG 4	710	0.01	460	0.040	0.71	0.01	0.3	0.040	0.005	7.74	6.0	456	9.7	19.0
10:15	AUG 17	150	0.01	180	0.035	0.69	0.01	0.2	0.039	0.001	7.70	6.1	457	6.9	19.0
10:10	AUG 31	150	0.01	100											20.5
10:20	SEPT 14	110	0.01	130	0.011	0.61	0.01	0.3	0.036	0.002	8.10	7.3	469	10.7	22.0
10:30	+SEPT 28	860	4	680	0.050	0.61	0.01	0.3	0.030	0.020	7.77	9.2	426	7.6	11.0
10:15	OCT 12	30	0.01	70	0.010	0.46	0.01	0.5	0.012	0.004	7.78	6.0	506	5.0	13.0
10:15	OCT 26	10	0.01	20	0.010	0.51	0.01	0.3	0.011	0.001	7.88	8.6	480	2.8	12.0
	minimum	10	0.01	20	0.005	0.46	0.01	0.2	0.011	0.001	7.70	3.5	426	2.8	11.0
	maximum	860	4	680	0.112	0.9	0.03	0.7	0.043	0.020	8.10	9.2	506	10.7	22.0
	average	275	0.37	281	0.03	0.7	0.01	0.4	0.03	0.006	7.80	6.4	465	6.5	17.2
	Geo.Mean	152	0.02	192	0.02	0.7	0.01	0.4	0.03						
	S.D.			236				0.2	0.01						

+ represents wet weather samples

DRY WEATHER SAMPLES

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
10:35	JUNE 7	110	0.01	170	0.020	0.71	0.01	0.7	0.029	0.007	7.97	5.0	464	5.4	14.0
10:40	JUNE 22	260	0.01	330	0.005	0.81	0.03	0.7	0.027	0.011	7.78	3.5	435	4.1	18.0
10:20	JULY 7	160	0.01	540	0.112	0.90	0.01	0.4	0.043	0.001	7.73	5.7	493	6.7	21.0
10:25	JULY 20	470	0.01	410											19.5
10:15	AUG 4	710	0.01	460	0.040	0.71	0.01	0.3	0.040	0.005	7.74	6.0	456	9.7	19.0
10:15	AUG 17	150	0.01	180	0.035	0.69	0.01	0.2	0.039	0.001	7.70	6.1	457	6.9	19.0
10:10	AUG 31	150	0.01	100											20.5
10:20	SEPT 14	110	0.01	130	0.011	0.61	0.01	0.3	0.036	0.002	8.10	7.3	469	10.7	22.0
10:15	OCT 12	30	0.01	70	0.010	0.46	0.01	0.5	0.012	0.004	7.78	6.0	506	5.0	13.0
10:15	OCT 26	10	0.01	20	0.010	0.51	0.01	0.3	0.011	0.001	7.88	8.6	480	2.8	12.0
	minimum	10	0.01	20	0.005	0.46	0.01	0.2	0.011	0.001	7.70	3.5	435	2.8	12.0
	maximum	710	0.01	540	0.112	0.9	0.03	0.7	0.043	0.011	8.10	8.6	506	10.7	22.0
	average	216	0.01	241	0.03	0.7	0.01	0.4	0.03	0.004	7.80	6.0	470	6.4	17.8
	Geo.Mean	127	0.01	169	0.02	0.7	0.01	0.4	0.03						
	S.D.			196				0.2	0.02						

1993 CURB PROGRAM WATER QUALITY DATA
STATION B-9

This site is on Be!grave Creek at L37 C6 East Wawanosh Twp.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
10:55	JUNE 7	90	0.01	130	0.041	0.65	0.03	2.1	0.029	0.009	8.13	15.0	541	5.0	16.5
10:50	JUNE 22	510	4	700	0.005	1.10	0.05	5.8	0.072	0.029	7.99	10.0	547	5.5	17.0
10:40	JULY 7	60	0.01	1000	0.043	0.65	0.04	2.1	0.034	0.001	8.06	15.1	572	5.0	23.5
10:40	JULY 20	430	8	540											18.5
10:25	AUG 4	140	0.01	360	0.015	0.50	0.03	1.5	0.020	0.001	7.91	16.8	562	3.9	19.0
10:25	AUG 17	200	0.01	190	0.046	0.61	0.03	0.7	0.030	0.001	7.84	16.1	549	4.6	22.0
10:25	AUG 31	340	0.01	220	0.022	0.53	0.02	0.7	0.027	0.006	7.84	17.8	545	5.2	21.0
10:30	SEPT 14	400	0.01	330	0.013	0.59	0.01	1.0	0.026	0.002	8.06	24.0	593	3.6	19.0
10:50	+SEPT 28	1000	36	1000	0.050	0.51	0.01	1.7	0.100	0.030	7.93	23.2	563	6.6	10.0
10:25	OCT 12	150	0.01	100	0.015	0.45	0.01	2.1	0.020	0.002	7.98	20.4	628	22.1	9.0
10:20	OCT 26	40	0.01	60	0.006	0.50	0.02	3.3	0.015	0.001	8.08	19.2	642	22.7	13.5
	minimum	40	0.01	60	0.005	0.45	0.01	0.7	0.015	0.001	7.84	10	54	3.6	9.0
	maximum	1000	36	1000	0.050	1.1	0.05	5.8	0.100	0.030	8.13	24.0	642	22.7	23.5
	average	305	4.37	421	0.03	0.6	0.03	2.1	0.04	0.01	8.00	17.8	574	8.4	17.2
	Geo.Mean	205	0.07	295	0.02	0.6	0.02	1.7	0.03						
	S.D.			369				1.6	0.03						

+ represents wet weather samples

DRY WEATHER SAMPLES

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
10:55	JUNE 7	90	0.01	130	0.041	0.65	0.03	2.1	0.029	0.009	8.13	15.0	541	5.0	16.5
10:50	JUNE 22	510	4	700	0.005	1.10	0.05	5.8	0.072	0.029	7.99	10.0	547	5.5	17.0
10:40	JULY 7	60	0.01	1000	0.043	0.65	0.04	2.1	0.034	0.001	8.06	15.1	572	5.0	23.5
10:40	JULY 20	430	8	540											18.5
10:25	AUG 4	140	0.01	360	0.015	0.50	0.03	1.5	0.020	0.001	7.91	16.8	562	3.9	19.0
10:25	AUG 17	200	0.01	190	0.046	0.61	0.03	0.7	0.030	0.001	7.84	16.1	549	4.6	22.0
10:25	AUG 31	340	0.01	220	0.022	0.53	0.02	0.7	0.027	0.006	7.84	17.8	545	5.2	21.0
1020	SEPT 14	400	0.01	330	0.013	0.59	0.01	1.0	0.026	0.002	8.06	24.0	593	3.6	19.0
10:35	OCT 12	150	0.01	100	0.015	0.45	0.01	2.1	0.020	0.002	7.98	20.4	628	22.1	9.0
10:30	OCT 26	40	0.01	60	0.006	0.50	0.02	3.3	0.015	0.001	8.08	19.2	642	22.7	13.5
	minimum	40	0.01	60	0.005	0.45	0.01	0.7	0.015	0.001	7.84	10	541	3.6	9.0
	maximum	510	8	1000	0.046	1.1	0.05	5.8	0.072	0.029	8.13	24	642	22.7	23.5
	average	236	1.21	363	0.02	0.6	0.03	2.1	0.03	0.01	8.00	17.2	575	8.6	17.9
	Geo.Mean	175	0.04	261	0.02	0.6	0.02	1.7	0.03						
	S.D.			320				1.7	0.02						

1993 CURB PROGRAM WATER QUALITY DATA
STATION D-190

This site is on the North Maitland River at the bridge on the B Line east of Wingham.

Time	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
11:15	JUNE 7	10	0.01	50	0.018	0.65	0.01	2.3	0.015	0.001	8.40	12.9	484	5.0	14.0
11:10	JUNE 22	700	12	1000	0.050	128	0.06	5.5	0.800	0.080	7.95	12.5	518	3.7	17.0
10:55	JULY 7	50	0.01	90	0.027	0.69	0.02	2.2	0.016	0.001	8.42	12.7	480	5.0	25.0
10:55	JULY20	120	0.01	120											21.5
11:05	AUG 4	180	0.01	100	0.012	0.57	0.01	0.8	0.013	0.001	8.39	13.7	415	5.0	20.0
10:45	AUG 17	40	0.01	50	0.027	0.63	0.01	0.5	0.016	0.001	8.50	13.8	437	5.0	24.0
10:45	AUG 31	140	0.01	120	0.029	0.56	0.01	0.3	0.012	0.001	8.29	15.0	433	5.0	23.0
10:55	SEPT 14	100	0.01	170	0.008	0.54	0.01	0.7	0.012	0.001	8.36	14.2	457	1.9	22.0
11:10	+SEPT 28	100	0.01	150	0.050	0.55	0.01	1.3	0.010	0.010	8.29	14.3	496		10.0
10:55	OCT 12	10	0.01	60	0.010	0.51	0.01	2.2	0.008	0.001	8.21	17.0	558	5.0	12.0
10:45	OCT 26	20	0.01	10	0.014	0.66	0.01	3.8	0.010	0.001	8.29	16.5	633	19.5	13.5
	minimum	10	0.01	10	0.008	0.51	0.01	0.3	0.008	0.0	7.90	12.5	15	1.9	10.0
	maximum	700	12	1000	0.050	1.28	0.06	5.5	0.800	0.080	8.50	17.0	633	19.5	25.0
	average	134	1.10	175	0.02	0.7	0.02	2.0	0.09	0.01	8.30	14.3	491	6.1	18.4
	Geo.Mean	65	0.02	94	0.02	0.6	0.01	1.4	0.02						
	S.D.			290				1.8	0.26						

+ represents wet weather samples

DRY WEATHER SAMPLES

The	Date	F.Strep	Ps.A	E.Coli	NH_4-N	TKN	NO_2^-	NO_3^-	Tot. P	Sol. P	pH	Chlor.	Cond.	Turb.	Temp.
11:15	JUNE 7	10	0.01	50	0.018	0.65	0.01	2.3	0.015	0.001	8.40	12.9	484	5.0	14.0
11:10	JUNE22	700	12	1000	0.050	1.28	0.06	5.5	0.800	0.080	7.95	12.5	518	3.7	17.0
10:55	JULY 7	50	0.01	90	0.027	0.69	0.02	2.2	0.016	0.001	8.42	12.7	480	5.0	25.0
10:55	JULY20	120	0.01	120											21.5
11:05	AUG 4	180	0.01	100	0.012	0.57	0.01	0.8	0.013	0.001	8.39	13.7	415	5.0	20.0
10:45	AUG 17	40	0.01	50	0.027	0.63	0.01	0.5	0.016	0.001	8.50	13.8	437	5.0	24.0
10:45	AUG 31	140	0.01	120	0.029	0.56	0.01	0.3	0.012	0.001	8.29	15.0	433	5.0	23.0
10:55	SEPT 14	100	0.01	170	0.008	0.54	0.01	0.7	0.012	0.001	8.36	14.2	457	1.9	22.0
10:55	OCT 12	10	0.01	60	0.010	0.51	0.01	2.2	0.008	0.001	8.21	17.0	558	5.0	12.0
10:45	OCT 26	20	0.01	10	0.014	0.66	0.01	3.8	0.010	0.001	8.29	16.5	633	19.5	13.5
	minimum	10	0.01	10	0.008	0.51	0.01	0.3	0.008	0.001	7.95	12.5	415	1.9	12.0
	maximum	700	12	1000	0.050	1.28	0.06	5.5	0.800	0.080	8.50	17.0	633	19.5	25.0
	average	137	1.21	177	0.02	0.7	0.02	2.0	0.10	0.01	8.30	14.3	491	6.1	19.2
	Geo.Mean	62	0.02	90	0.02	0.7	0.01	1.4	0.02						
	S.D.			307				1.9	0.28						