Final

Source Water Assessment

for the

Goodwill Mennonite Home, Inc. Water System

Garrett County, Maryland

Prepared for:

Maryland Department of the Environment
Water Management Administration
Water Supply Program
1800 Washington Boulevard, Suite 625
Baltimore, Maryland 21230-1719

Prepared by:

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LIST OF ACRONYMS AND ABBREVIATIONS

BMP	Best Management Practice
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Act Information System
CHS	Controlled Hazardous Substances
COMAR	Code of Maryland Regulations
CREP	Conservation Reserve Program
DWEL	Drinking Water Equivalent Level
ft	Foot/Feet
gpd	Gallon(s) Per Day
gpm	Gallon(s) Per Minute
GPS	Global Positioning System
GWUDI	Ground Water Under the Direct Influence
in.	Inch(es)
IOC	Inorganic Compound
LUST	Leaking Underground Storage Tank
MCL	Maximum Contaminant Level
MDE	Maryland Department of the Environment
mg/L	Milligram(s) Per Liter
MGS	Maryland Geological Survey
NPL	National Priorities List
pCi/L	Picocurie(s) Per Liter
PWSID	Public Water System Identification
SDWA	Safe Drinking Water Act
SDWR	Secondary Drinking Water Regulations
SOC	Synthetic Organic Compound
SWAP	Source Water Assessment Plan
SWPA	Source Water Protection Area
SWPP	Source Water Protection Plan
µg/L	Microgram(s) Per Liter
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WHPA	Well Head Protection Area

EXECUTIVE SUMMARY

EA Engineering, Science, and Technology was tasked to perform a Source Water Assessment for the Goodwill Mennonite Home water system in Garrett County, Maryland. The Maryland Department of the Environment (MDE) identifies this water system as Public Water System Identification (PWSID) 0110205. EA has performed this study under Purchase Order No. U00P9200205, as authorized by MDE.

The required components of this report, as described in Maryland's Source Water Assessment Plan (SWAP), are:

- Delineation of the area that contributes water to the source
- Identification of potential sources of contamination
- Determination of the susceptibility of the water supply to contamination
- Recommendations for protecting the drinking water supply

The source of the Goodwill Mennonite Home water supply is the Conemaugh Formation, which is an unconfined, sandstone and shale aquifer. The Source Water Protection Area (SWPA) for the four ground-water supply wells was delineated using the watershed delineation method for fractured bedrock wells. The SWPA is based on land topography, nearby streams, and a calculation of the total ground-water contributing area during a drought. The SWPA is approximately 185 acres and is irregular in shape.

Potential point and non-point sources of contamination within the assessment area were identified based on site visits, a review of MDE's databases, and a review of sewer service area and land use maps. Septic systems and fuel storage containers were observed on-site and can be considered point sources of contaminants. Cropland and pastures were observed within the SWPA. Cropland and pastures account for 90 percent of the SWPA and can be considered a non-point source of contaminants. Well information and water quality data were also reviewed.

The susceptibility analysis for the Goodwill Mennonite Home's water supply is based on a review of the water quality data, potential sources of contamination, aquifer characteristics, and well integrity. It was determined that the Goodwill Mennonite Home's water supply has a low susceptibility to volatile organic compounds, synthetic organic compounds, inorganic compounds, radionuclides, and microbiological contaminants.

Recommendations to protect the ground-water supply include creating a SWPA team, resident awareness, and communication with County officials about future planning and land use.

1. INTRODUCTION

EA Engineering, Science, and Technology was tasked to perform a Source Water Assessment for the Goodwill Mennonite Home, Inc. water system in Garrett County, Maryland. EA has performed this study under Purchase Order No. U00P3200205, as authorized by the Maryland Department of the Environment (MDE).

The Goodwill Mennonite Home, Inc. serves the residents of the Goodwill Mennonite Home in northern Garrett County. The water treatment plant and supply wells for the system are located adjacent to the Goodwill Mennonite Home. The Goodwill Mennonite Home, Inc. serves a population of 285 with 24 connections. Four wells supply the water for this system (Figure 1).

1.1 GROUND-WATER SUPPLY SYSTEM INFORMATION

From a review of the well data and sanitary surveys of the system it was reported that the four supply wells were drilled between 31 July 1986 and 6 September 2001, in accordance with the current State well construction standards, which were implemented in 1973. The four production wells have a combined average yield of 24,600 gallons per day (gpd). The production wells were observed to be in good condition with tightly sealed caps. A summary of the well construction data is shown in Table 1 below:

TABLE 1. WELL INFORMATION

Source ID	Source Name	Permit No.	Total Depth (ft)	Casing Depth (ft)	Aquifer
01	Goodwill A	GA810560	186	42	Conemaugh Formation
02	Goodwill B	GA880446	250	49	Conemaugh Formation
03	Goodwill C	GA880447	350	49	Conemaugh Formation
06	Goodwill G	GA941978	404	53	Conemaugh Formation

Also, Goodwill H (GA941876) is filled with methane that was discovered while drilling. The well is securely capped, is drilled to 844 ft, and is not in use.

According to MDE, the operator of this system is Gary Bunnel (OT-1), the on-site Environmental Services Manager for Goodwill Mennonite Home, Inc.

Currently, the system uses sodium hypochlorite (bleach) for disinfection. Also, soda ash is added to increase the pH and prevent corrosion. Two Culligan treatment systems are used to soften the water.

1.2 HYDROGEOLOGY

Garrett County lies entirely within the Appalachian Plateau physiographic province, and is the westernmost county in Maryland. Pleistocene terraces and recent flood plains found along the larger streams and consolidated sedimentary rocks of the mid-Paleozoic (Devonian, Mississippian, and Pennsylvanian age) dominate the surface and subsurface geology.

2. DELINEATION OF THE AREA CONTRIBUTING WATER TO SOURCE

For ground-water systems, a wellhead protection area (WHPA) is considered to be the Source Water Protection Area (SWPA) for the system. Consistent with the recommended delineation in the Maryland Source Water Assessment Plan (SWAP) (MDE 1999), the watershed drainage area that contributes ground water to the supply wells methodology was used.

This delineation shape accounted for surface water bodies, topography, significant land features, and by using a conservative calculation of total ground-water recharge during a drought. For conservative purposes, a drought condition recharge value of 400 gpd per acre (or approximately 5.4 in. per year) was used to estimate the total ground-water contribution area required to supply the well.

The current Water Appropriation Permit for the Goodwill Mennonite Home, Inc. issued by the MDE Water Rights Division is for an average withdrawal of 24,600 gpd. To determine the total ground-water contribution area during a drought, the following equation was used:

Recharge Area (acre) = Average Use (gpd)/Drought Condition Recharge (gpd/acre)

From the equation above, the total ground-water contributing area during a drought is approximately 62 acres. The delineated SWPA is approximately 185 acres (Figure 2), and is therefore adequate to meet the average daily ground-water usage during a drought.

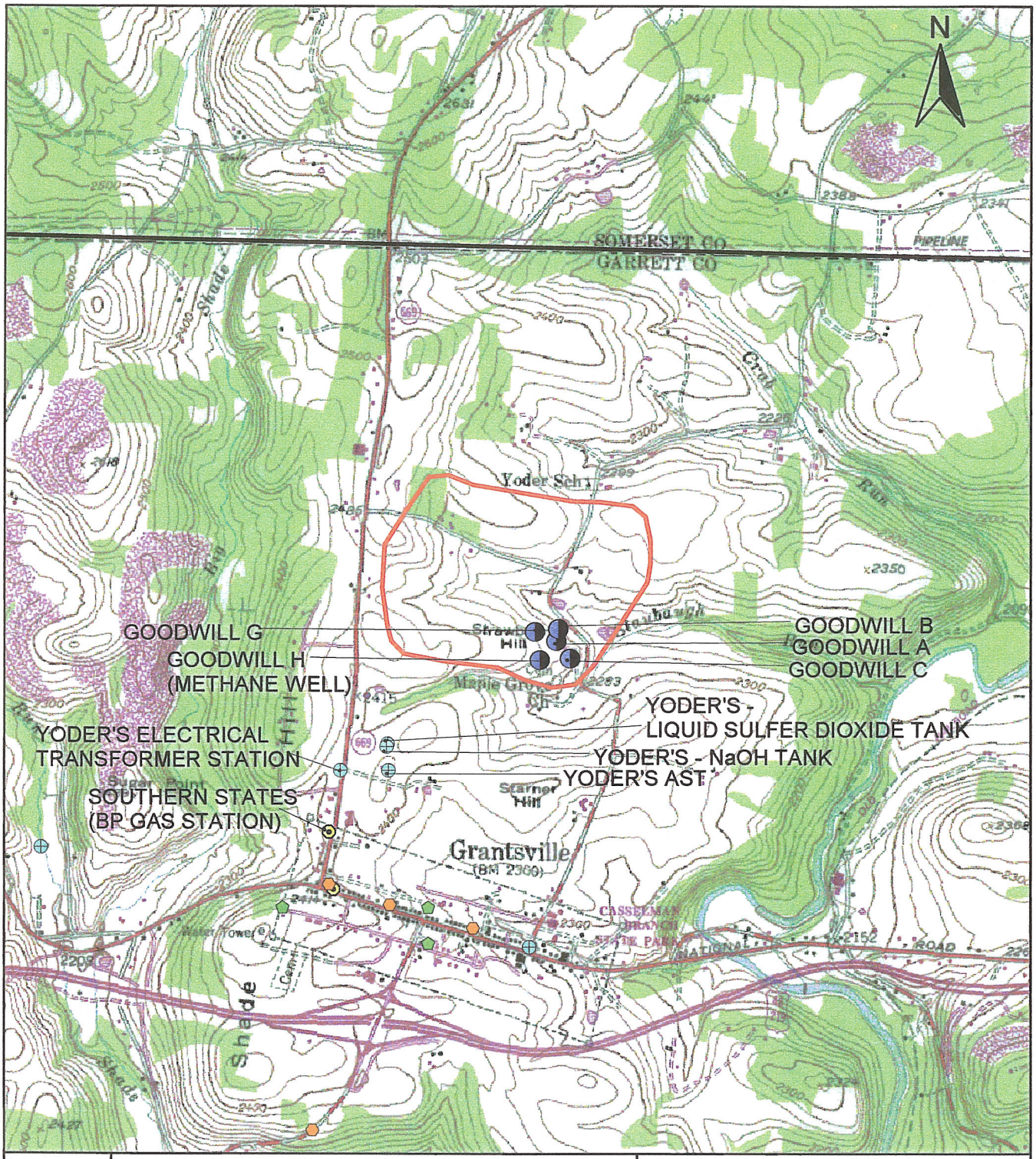


Figure 2. Goodwill Mennonite Home Source Water Protection Area Map with Potential Sources of Contamination

Source Water Assessment Program
2003

Legend:
- Supply Well
- SWPA Boundary
- UST
- Miscellaneous
- CHS
- Pesticide

Source: United States Geologic Survey. 1994. *7.5-minute Series Topographic Map for Grantsville, Maryland-Pennsylvania.*

United States Geologic Survey. 1947 (photorevised 1981). *7.5-minute Series Topographic Map for Avilton, Maryland-Pennsylvania.*

Scale:
1000 0 1000 2000 Feet

3. INVENTORY OF POTENTIAL CONTAMINANTS WITHIN THE DELINEATED AREA

A field survey was performed on 16 December 2002 to confirm potential sources of contamination identified in MDE databases around the ground-water wells. These databases include the Comprehensive Environmental Response, Compensation, and Liability Act Information System (CERCLIS), which includes National Priorities List (Superfund) sites, Maryland Registered Underground Storage Tank (UST) sites, Maryland Leaking Underground Storage Tank (LUST) sites, landfills, pesticide dealers, ground-water discharge permits, and Controlled Hazardous Substances (CHS) generator sites.

During the field survey, other sources of potential contamination not in the MDE databases were noted and the location was surveyed using a global positioning system (GPS) receiver for mapping purposes (Figure 2).

3.1 POINT SOURCES

A septic system drain field to the south and west of the facility was observed on-site. Septic discharge could contain contaminants if there is insufficient treatment of biological contaminants, such as coliforms, and inorganic compounds, such as nitrate. Septic system discharge could also contain contaminants that the system is not designed to treat, such as solvents and fuel.

Also, a large storage shed in the middle of the property, adjacent to the parking lot, was observed on-site. This shed contains various fuel and oil products for landscaping and property maintenance equipment. Repeated petroleum fuel releases and spills onto the surface could impact the ground water with volatile organic compounds (VOCs) and some synthetic organic compounds (SOCs).

Additionally, Goodwill H, the methane well, is not currently abandoned and sealed. If not maintained, the well could become a direct pathway for contaminants to enter the aquifer.

3.2 NON-POINT SOURCES

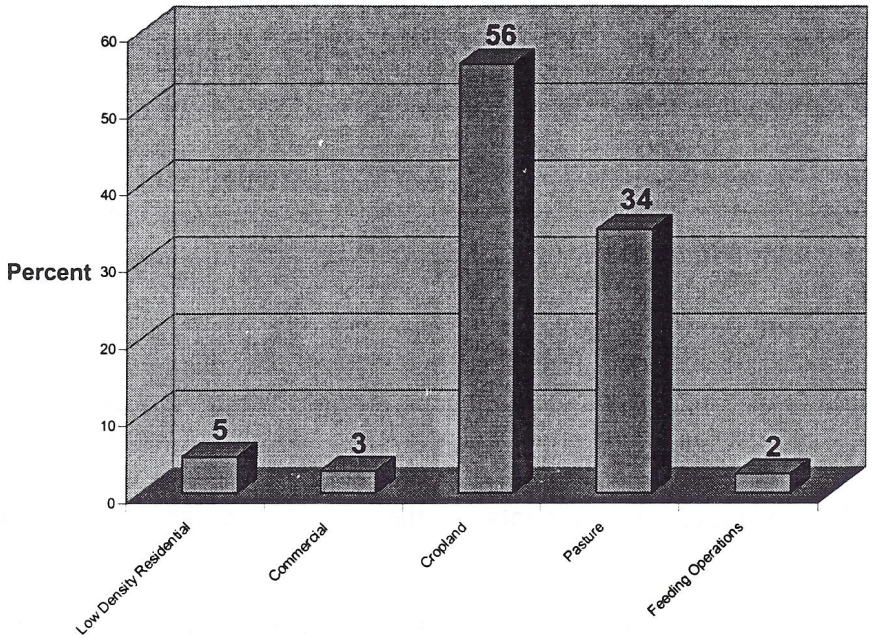
In addition to the above point sources, non-point source cropland and pastures were observed within the SWPA.

Using the Maryland Office of Planning 2000 Land Use/Land Cover map for Garrett County, potential non-point sources within the SWPA were also evaluated by land use designation (Figure 3). A summary of the percent and acreage of each type of land use is presented in the graphs on the following page.

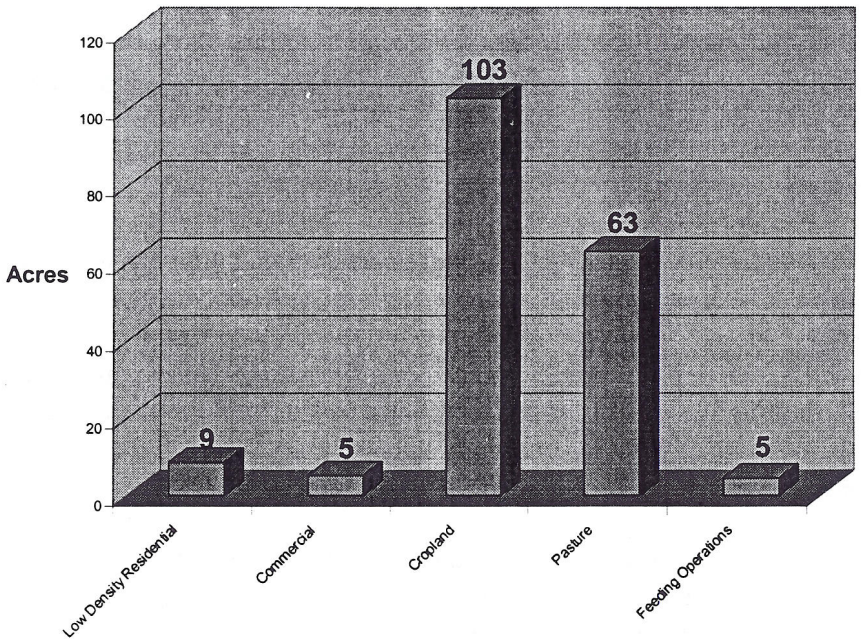
From an interpretation of the graphs, cropland (103 acres) and pastures (63 acres) account for nearly all of the SWPA (184.5 acres). The use of fertilizers in croplands is common, and excessive animal waste in pasture areas can be a source of nitrate pollution in ground water.

Using the 1993 Maryland Office of Planning Garrett County sewerage coverage, potential non-point sources from septic system users in the SWPA were assessed (Figure 4). By overlaying the SWPA on the sewerage coverage layer in Arc View GIS, it was determined that 100 percent of the SWPA does not have public sewer service, nor is any planned for the next 10 years.

PERCENTAGE OF EACH LAND USE TYPE



ACREAGE OF EACH LAND USE TYPE



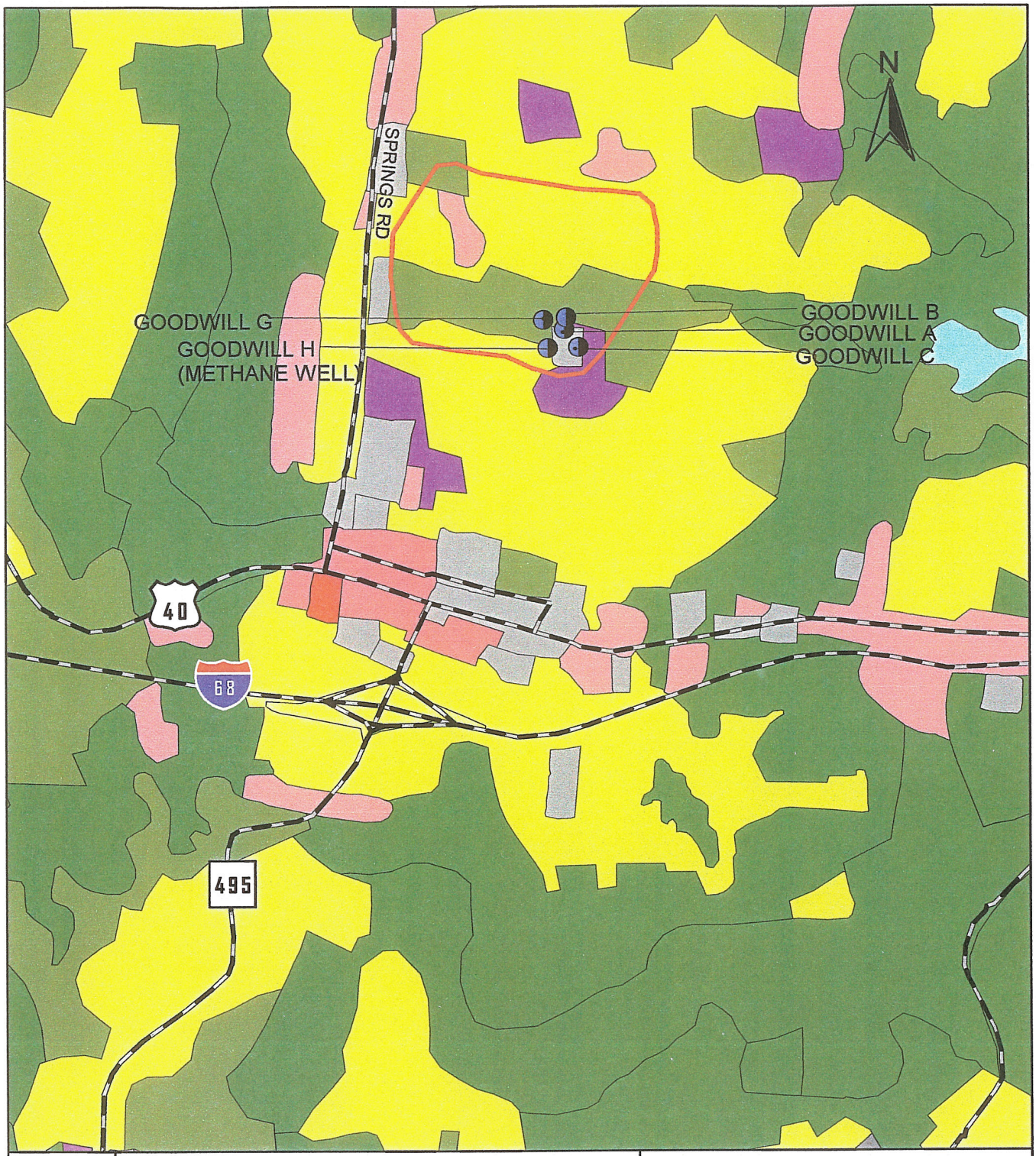


Figure 3. Goodwill Mennonite Home
Land Use Map of the
Source Water Protection Area
Source Water Assessment Program
2003

Scale: 2000 0 2000 Feet

Source: Maryland Office of Planning, 2000.

Legend:

- Supply Well
- SWPA Boundary
- Major Roads

Land Use

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Extractive
- Cropland
- Pasture
- Forest
- Feeding Operations
- Wetlands

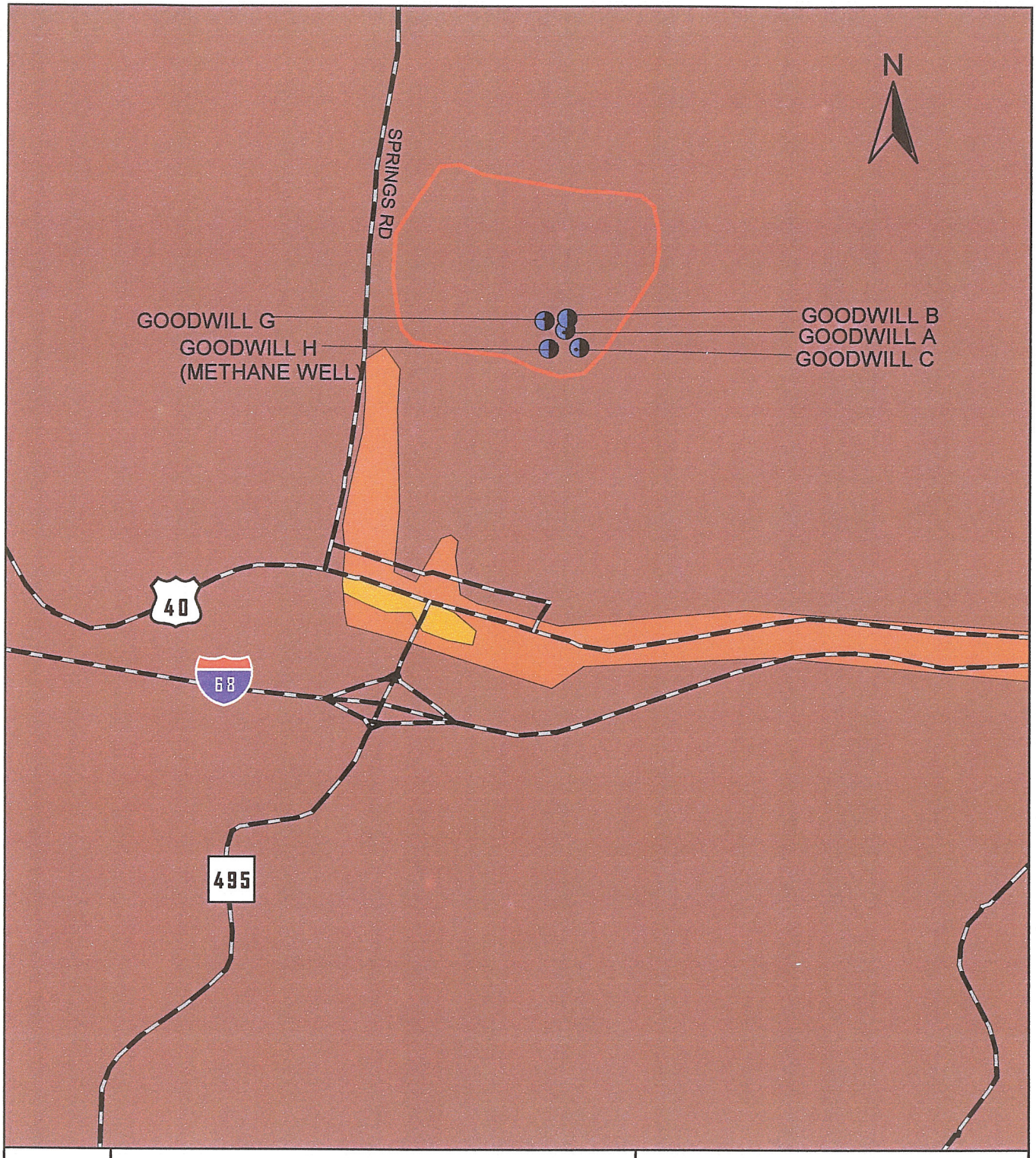


Figure 4. Goodwill Mennonite Home Sewer Service Map of the Source Water Protection Area

Source Water Assessment Program
2003

Legend:

- Supply Well
- SWPA Boundary
- Major Roads

Sewer

- No planned service area
- Existing service area
- Area programmed for service 3 to 6-7 years

Source: Maryland Office of Planning, 1993.

Scale: 1000 0 1000 2000 Feet

4. REVIEW OF WATER QUALITY DATA

Water quality data were obtained from the MDE Water Supply Program database of Safe Drinking Water Act (SDWA) contaminants. The results reported are for finished (treated) ground water (unless noted).

A review of the water quality data from 1993-2002 has been performed for Goodwill Mennonite Home finished water samples. The results of the ground-water sample analysis are shown in Appendix A.

Ground-water analytical results were compared to 50 percent of the U.S. Environmental Protection Agency (USEPA) Maximum Contaminant Levels (MCLs) or the USEPA Secondary Drinking Water Regulations (SDWR). If no MCL or SDWR was available, the Drinking Water Equivalent Level (DWEL) was substituted as recommended by the USEPA Office of Water.

4.1 GENERAL WATER QUALITY PARAMETERS

No general water quality parameters were reported in the ground-water samples at concentrations greater than 50 percent of the comparison criteria.

Two ground-water samples for pH were collected 20 May 1996 and 19 September 2001 with pH values of 6.9 and 7.6, respectively. Both are within the normal SDWR range of 6.5 to 8.5.

4.2 VOLATILE ORGANIC COMPOUNDS

No VOCs were reported in the ground-water samples at concentrations greater than 50 percent of the comparison criteria.

Low levels of chloroethane (0.7 µg/L) were detected in ground-water samples collected on 24 March 1999. Currently, there is no USEPA MCL, SDWR, or DWEL for this compound.

4.3 SYNTHETIC ORGANIC COMPOUNDS

No SOCs were reported in the ground-water samples at concentrations greater than 50 percent of the comparison criteria.

A low-level concentration of dalapon (0.16 µg/L) was detected in a ground-water sample collected on 24 March 1999. The USEPA MCL for dalapon, a common herbicide, is 200 µg/L.

4.4 INORGANIC COMPOUNDS

The inorganic compound (IOC) manganese was reported at a concentration (0.05 mg/L) equal to the SDWR (0.05 mg/L) in water sample collection on 19 September 2001. This was the only sample submitted for analysis of manganese.

Also, iron (0.68 mg/L) was found to exceed the 50 percent SDWR criteria in the only sample collected on 19 September 2001 that was submitted for iron analysis. A summary of the manganese and iron concentrations in the ground-water sample collected is shown in Table 2.

TABLE 2. SUMMARY OF MANGANESE AND IRON ANALYSIS

Plant ID	Sample Date	Contaminant	Result	Unit
01	9/19/01	MANGANESE	0.05	mg/L
01	9/19/01	IRON	0.68	mg/L

Note:
Shaded values are greater than or equal to the SDWR.

Low-level concentrations of nitrate were reported in ground-water samples collected between 22 December 1993 and 30 January 2001, ranging from 0.9 to 3.8 mg/L. A low-level nitrite concentration (0.003 mg/L) was reported in ground-water samples collected on 20 May 1996. The reported nitrate and nitrite concentrations are below the USEPA primary drinking water standard parameters of 10 and 1 mg/L, respectively.

Fluoride was detected in ground-water samples collected between 25 October 1995 and 24 March 1999. Fluoride concentrations ranged from 0.12 to 0.15 mg/L, which is below the USEPA MCL for fluoride of 4.0 mg/L.

Sodium was detected in ground-water samples collected on 24 March 1999 and 19 September 2001. The reported concentrations were 120 and 2.2 mg/L, respectively. USEPA has an advisory range for sodium between 30 and 60 mg/L.

Sulfate was detected at low levels in two ground-water samples collected on 20 May 1996 (26.8 mg/L) and 24 March 1999 (31.9 mg/L). These concentrations are less than the SDWR for sulfate of 250 mg/L.

A low-level concentration of barium (0.15 mg/L) was reported in a ground-water sample collected on 19 September 2001, which is below the USEPA MCL for barium of 2 mg/L.

Additionally, a low-level concentration of chloride (13 mg/L) was detected in a ground-water sample collected on 19 September 2001 below the SDWR for chloride of 250 mg/L.

4.5 MICROBIOLOGICAL CONTAMINANTS

No total or fecal coliforms have been detected in samples of the finished water from January 1997 to August 2002.

4.5.1 Ground Water Under the Direct Influence (GWUDI)

Surface water that directly recharges the aquifer through major fractures in rock does not pass through the soil overburden that both filters and contains beneficial microorganisms that break down contaminants. If significant variances in the ground-water results from dry and storm conditions are observed, it is possible that the ground water is under the direct influence of surface water.

To assess the potential of Ground Water Under the Direct Influence (GWUDI) of surface water, ground-water sampling records (during dry and storm conditions) in MDE databases were assessed and information from Public Water Reports were reviewed.

Wells A, B, and C samples collected on 2 December 1998 had no detectable total coliform or fecal coliform bacteria. From an assessment of GWUDI ground-water results by MDE, these wells are not under the influence of surface water. No data is available to date to evaluate Well G.

4.6 RADIONUCLIDES

No radionuclides were reported in the ground-water samples greater than 50 percent of the more conservative proposed MCL.

Gross alpha and radon-222 were detected in the ground-water samples. The reported gross alpha concentration [1.4 picocuries per liter (pCi/L)] is less than the MCL of 15 pCi/L. Radon-222 had a detected concentration of 95 pCi/L, which is less than the more conservative proposed MCL of 300 pCi/L. This MCL is a proposed MCL established by USEPA since there is no current MCL for this contaminant (USEPA 1999). However, if the State has a program to address the more significant risk from radon in indoor air, then 4,000 pCi/L can be used as an alternate MCL. For the purpose of this investigation, the more conservative number was used.

5. SUSCEPTIBILITY ANALYSIS

To evaluate the integrity of the ground-water source, the following criteria were used to conduct the susceptibility analysis:

1. Available water quality data
2. Presence of potential contaminant sources in the SWPA
3. Aquifer characteristics
4. Well integrity
5. Likelihood of change to the natural conditions

The aquifer that supplies the Goodwill Mennonite Home, Inc. drinking water is an unconfined aquifer.

For the Susceptibility Analysis in this report, rankings of "high," "moderate," and "low" susceptibility to contamination were utilized after a review of current information. However, other SWAP reports for the State of Maryland also utilized rankings of "is," "may be," and "is not" susceptible to contamination. For consistency between the ranking systems, the following details their equivalence. The ranking of "highly susceptible" is equivalent to "is susceptible," "moderately susceptible" is equivalent to "may be susceptible," and "low susceptibility" is equivalent to "is not susceptible."

5.1 VOLATILE ORGANIC COMPOUNDS

No VOC concentrations were reported greater than 50 percent of any comparison criteria in any of the water samples analyzed.

Chloroethane (or ethyl chloride) was detected in low concentration (0.7 µg/L) in one water sample collected in March 1999. Chloroethane is typically found in solvents and refrigerants; however, this compound was only detected in one sample during one sampling event and no potential sources were observed within the SWPA. Chloroethane currently has no MCL, SDWR, or DWEL.

Based on the water quality reviewed, the integrity of the wells, and the absence of observed or reported facilities that could cause VOC contamination in the SWPA, the water supply at the Goodwill Mennonite Home has a low susceptibility to VOCs.

5.2 SYNTHETIC ORGANIC COMPOUNDS

No SOCs were reported in the ground-water samples greater than 50 percent of the comparison criteria.

The commercial herbicide dalapon was detected at a low concentration in a single sample collected in March 1999. Dalapon is a herbicide used to control grasses in a wide variety of crops, and is also registered for use in a number of non-crop applications such as lawns.

Dalapon may be in compounds used for landscaping and controlling weeds on or near the property.

From well construction records, there is approximately 40 to 50 ft of unconsolidated material between the surface and the bedrock aquifer. SOCs have an affinity to sorb to soil particles and generally have low solubilities in water.

Based on the water quality reviewed, the absence of observed or reported facilities that could cause SOC contamination in the SWPA, and the relative thickness of the soil overburden, the water supply at the Goodwill Mennonite Home has a low susceptibility to SOCs.

5.3 INORGANIC COMPOUNDS

Manganese concentrations (0.05 mg/L) were detected in water samples that were equal to the SDWR. According to Garrett County general water quality parameters, manganese typically ranges between 0 and 1.2 mg/L, with an average concentration of 0.13 mg/L (MGS 1980). The reported concentration is within this range and less than the average detected manganese. Manganese is a naturally occurring substance found in many types of rock and soil; it is ubiquitous in the environment and found at low levels in water and soil.

Iron (0.68 mg/L) was detected at more than twice the SDWR of 0.3 mg/L in samples from September 2001. Iron is naturally present at low levels in ground water, and ranges from 0.03 to 51 mg/L in Garrett County ground water, with an average concentration of 1.7 mg/L (MGS 1980). The reported iron concentration is within this range and less than the average detected iron. Iron is a common, naturally occurring element found in rock and soil and is likely present from natural sources within the aquifer.

One hundred percent of the SWPA is not served by public sewerage and residential and commercial areas likely uses septic systems, which can cause nitrate pollution in ground water. However, no concentrations of nitrate have been reported greater than 3.8 mg/L, which is below the USEPA MCL of 10 mg/L. No trends in the reported nitrate concentrations have been observed over time. Any potentially elevated levels could occur due to the influx of agricultural chemicals or fertilizers, from animal waste, or septic system effluent into the drinking water.

Chloride, sodium, sulfate, and calcium are all major ionic compounds of natural ground water. All four were detected at low concentrations, and are within the range of each constituent for the general water quality parameters of Garrett County (MGS 1980).

Based on the water quality data reviewed, lack of sources of IOC contamination, and a review of regional background ground-water concentrations, the water supply for the Goodwill Mennonite Home has a low susceptibility to IOC contamination.

5.4 RADIONUCLIDES

The presence of radionuclides in ground water is generally attributed to the decay of naturally occurring minerals such as uranium in the aquifer; however, no radionuclides were reported in the ground-water samples greater than 50 percent of the comparison criteria.

Therefore, the water supply at the Goodwill Mennonite Home has a low susceptibility to radionuclides.

5.5 MICROBIOLOGICAL CONTAMINANTS

No total or fecal coliforms have been detected in samples of the water system's finished water from January 1997 to August 2002.

From an assessment of GWUDI ground-water results by MDE, wells A, B, and C are not under the influence of surface water. No sampling data was available to date to make the GWUDI determination for Well G.

From the documentation, all production wells were constructed after 1973, the year that current well construction standards were required. All wellheads were observed to be in good repair and tightly sealed.

In addition, the raw water is disinfected with chlorine prior to distribution.

Based on the water quality review and the GWUDI results, the water supply for the Goodwill Mennonite Home has a low susceptibility to microbiological contamination.

6. RECOMMENDATIONS FOR PROTECTING THE WATER SUPPLY

With the information contained in this report, the Goodwill Mennonite Home, Inc. has a basis for better understanding of the risks to its drinking water supply. Being aware of the SWPA, knowing potential contaminant sources, evaluating current and future development, working with agricultural producers and soil conservation agencies, and effective outreach and education are examples of management practices that will help protect the water supply.

Recommendations for the protection of the ground-water supply are intended for the water supplier and its residents. Specific management recommendations for consideration are listed below.

6.1 PROTECTION TEAM

The team should represent all the interests in the community, such as water suppliers, community associations officers, the County Health Department, local planning agencies, local businesses, developers, property owners, and residents within and near the SWPAs. The team should work to reach a consensus on how to protect the water supply.

6.2 PUBLIC AWARENESS AND OUTREACH

The water supplier should consider discussing with property owners and businesses located within the SWPA the activities that could have impacts to the ground water and its quality.

The water supplier should also consider sending pamphlets, flyers, or bill stuffers to its residents to educate them about the SWPA. An example pamphlet, "Gardening in a Wellhead Protection Area," is available from MDE. The residents should also be encouraged to notify the Goodwill Mennonite Home management of any significant spills from gasoline or any other potentially hazardous substances.

Placing signs at the SWPA boundaries is an effective way to make the public aware of protecting their source of water supply, and to help in the event of spill notification and response.

The Executive Summary of this report should also be listed in the Consumer Confidence Report for the water system, and should also indicate that the report is available to the general public by contacting the water supplier, the local library, or MDE.

6.3 PLANNING/NEW DEVELOPMENT

The water supplier should also inform the Garrett County Health and Planning Departments of any concerns about future development or zoning changes for properties that are within the SWPA.

6.4 MONITORING

The water supplier should continue to monitor the ground water for all SWDA contaminants as required by MDE.

Annual raw water sampling at each well for microbiological contaminants is a good way to check the integrity of each well.

Well G was not tested for GWUDI to date. GWUDI samples should be collected and submitted for laboratory analysis as soon as possible.

6.5 CONTINGENCY PLAN

As required by the Code of Maryland Regulations (COMAR) 26.04.01.22, all water system owners are required to prepare and submit a plan to provide safe drinking water under emergency conditions for approval by MDE.

The water supplier should develop a Spill Contingency Plan. Quick and effective spill response in the event of accidental spills or leaks is an important element in the water supplier's SWPP. This plan should identify the procedures and resources to be used to mitigate any discharge of oil or hazardous substances in the SWPA. It should also establish responsibilities, duties, procedures, and resource containment, mitigation, and cleanup of accidental discharges of oil and hazardous substances that may occur within the SWPA. In all cases when spills may present a significant risk of contamination to ground water within the SWPA the local fire department should be notified of the incident.

6.6 CHANGES IN USES

The water supplier are required to inform the Water Supply Program at MDE of any changes to pumping rates and when a change in the number of wells used is anticipated. Any changes to the pumping rate and/or the number of supply wells will affect the size and shape of the SWPA.

6.7 CONTAMINANT SOURCE INVENTORY UPDATES/INSPECTIONS

The water supplier should conduct its own survey of the SWPA to ensure that there are no additional potential sources of contamination.

A regular inspection and maintenance program of the supply wells should be considered to prevent a failure in the integrity of the wells, which could provide a pathway for contaminants to the aquifer.

Any depressions around the wellheads should be filled and graded to prevent surface water ponding that could occur during rain events. This will help to prevent surface water infiltration into the well.

6.8 PURCHASE CONSERVATION EASEMENTS OR PROPERTY

Loans are available for the purchase of property or for the purchase of easements for protection of the water supply. Eligible property must lie within the designated SWPA. Loans are currently offered at zero percent interest and zero points. Please contact the Water Supply Program of the MDE for more information.

6.9 COOPERATIVE EFFORTS WITH OTHER AGENCIES

The water supplier may request the assistance of the University of Maryland Agricultural Extension Service, Soil Conservation Service to work with the nearby farmers to adopt Best Management Practices (BMPs) for cropland located within the SWPA. The nearby farmers can also participate in the New Conservation Reserve Program (CREP) applicable to the cropland located within the SWPA. Government funding is available to qualified farmers equal to the cost and financial benefit of farming the area. The Natural Resources Conservation Service is responsible for determining the relative environmental benefits of each acre offered for participation.

7. REFERENCES

The following sources of information were consulted as a part of this investigation:

1. Maryland Geological Survey (MGS). 1980. *Garrett County Water-Well Records, Chemical-Quality Data, Ground-Water Use, Coal Test-Hole Data and Surface-Water Data*. 102 pp.

2. Maryland Department of the Environment (MDE), Water Supply Program. 1999. *Maryland's Source Water Assessment Plan*. 36 pp.

3. United States Environmental Protection Agency (USEPA). 1999. *Proposed Radon in Drinking Water Rule*. EPA 815-F-99-006. USEPA Office of Water.

SOURCES OF DATA

Water Appropriation and Use Database
Public Water Supply Inspection Reports
Monitoring Reports
MDE Water Supply Program Oracle Database
MDE Waste Management Sites Database
Maryland Office of Planning 2000 Garrett County Land Use Map
Maryland Office of Planning 1993 Garrett County Sewer Service Map
USGS Topographic 7.5-minute Quadrangle Map – 1994 Grantsville, Maryland Quad
USGS Topographic 7.5-minute Quadrangle Map – 1947 Avilton, Maryland Quad

Appendix A

Results of Ground-Water Sample Analysis

SUMMARY GOODWILL MENNONITE HOME, INC. WATER SAMPLE ANALYSIS

Plant ID	Sample Date	Contaminant Name	Result	MCL
Volatile Organic Compounds			µg/L	µg/L
01	1/17/1995	1,1,1,2-TETRACHLOROETHANE	--	
01	4/3/1995	1,1,1,2-TETRACHLOROETHANE	--	
01	7/3/1995	1,1,1,2-TETRACHLOROETHANE	--	
01	10/2/1995	1,1,1,2-TETRACHLOROETHANE	--	
01	5/29/1996	1,1,1,2-TETRACHLOROETHANE	--	
01	1/31/1997	1,1,1,2-TETRACHLOROETHANE	--	
01	1/29/1998	1,1,1,2-TETRACHLOROETHANE	--	
01	3/24/1999	1,1,1,2-TETRACHLOROETHANE	--	
01	9/19/2001	1,1,1,2-TETRACHLOROETHANE	--	
01	1/17/1995	1,1,1-TRICHLOROETHANE	--	
01	4/3/1995	1,1,1-TRICHLOROETHANE	--	
01	7/3/1995	1,1,1-TRICHLOROETHANE	--	
01	10/2/1995	1,1,1-TRICHLOROETHANE	--	
01	5/29/1996	1,1,1-TRICHLOROETHANE	--	
01	1/31/1997	1,1,1-TRICHLOROETHANE	--	
01	1/29/1998	1,1,1-TRICHLOROETHANE	--	
01	3/24/1999	1,1,1-TRICHLOROETHANE	--	
01	9/19/2001	1,1,1-TRICHLOROETHANE	--	
01	1/17/1995	1,1,2,2-TETRACHLOROETHANE	--	
01	4/3/1995	1,1,2,2-TETRACHLOROETHANE	--	
01	7/3/1995	1,1,2,2-TETRACHLOROETHANE	--	
01	10/2/1995	1,1,2,2-TETRACHLOROETHANE	--	
01	5/29/1996	1,1,2,2-TETRACHLOROETHANE	--	
01	1/31/1997	1,1,2,2-TETRACHLOROETHANE	--	
01	1/29/1998	1,1,2,2-TETRACHLOROETHANE	--	
01	3/24/1999	1,1,2,2-TETRACHLOROETHANE	--	
01	9/19/2001	1,1,2,2-TETRACHLOROETHANE	--	
01	1/17/1995	1,1,2-TRICHLOROETHANE	--	
01	4/3/1995	1,1,2-TRICHLOROETHANE	--	
01	7/3/1995	1,1,2-TRICHLOROETHANE	--	
01	10/2/1995	1,1,2-TRICHLOROETHANE	--	
01	5/29/1996	1,1,2-TRICHLOROETHANE	--	
01	1/31/1997	1,1,2-TRICHLOROETHANE	--	
01	1/29/1998	1,1,2-TRICHLOROETHANE	--	
01	3/24/1999	1,1,2-TRICHLOROETHANE	--	
01	9/19/2001	1,1,2-TRICHLOROETHANE	--	
01	1/17/1995	1,1-DICHLOROETHANE	--	
01	4/3/1995	1,1-DICHLOROETHANE	--	
01	7/3/1995	1,1-DICHLOROETHANE	--	
01	10/2/1995	1,1-DICHLOROETHANE	--	
01	5/29/1996	1,1-DICHLOROETHANE	--	
01	1/31/1997	1,1-DICHLOROETHANE	--	
01	1/29/1998	1,1-DICHLOROETHANE	--	
01	3/24/1999	1,1-DICHLOROETHANE	--	
01	9/19/2001	1,1-DICHLOROETHANE	--	
01	1/17/1995	1,1-DICHLOROETHYLENE	--	
01	4/3/1995	1,1-DICHLOROETHYLENE	--	

- -=Not Detected
NA=No Criteria
*=SDWR
^=DWEL
+=Drinking Water Adv Level

SUMMARY GOODWILL MENNONITE HOME, INC. WATER SAMPLE ANALYSIS

Plant ID	Sample Date	Contaminant Name	Result	MCL
Volatile Organic Compounds			µg/L	µg/L
01	1/29/1998	1,3-DICHLOROPROPENE	--	
01	3/24/1999	1,3-DICHLOROPROPENE	--	
01	9/19/2001	1,3-DICHLOROPROPENE	--	
01	1/17/1995	2,2-DICHLOROPROPANE	--	
01	4/3/1995	2,2-DICHLOROPROPANE	--	
01	7/3/1995	2,2-DICHLOROPROPANE	--	
01	10/2/1995	2,2-DICHLOROPROPANE	--	
01	5/29/1996	2,2-DICHLOROPROPANE	--	
01	1/31/1997	2,2-DICHLOROPROPANE	--	
01	1/29/1998	2,2-DICHLOROPROPANE	--	
01	3/24/1999	2,2-DICHLOROPROPANE	--	
01	9/19/2001	2,2-DICHLOROPROPANE	--	
01	1/17/1995	BENZENE	--	
01	4/3/1995	BENZENE	--	
01	7/3/1995	BENZENE	--	
01	10/2/1995	BENZENE	--	
01	5/29/1996	BENZENE	--	
01	1/31/1997	BENZENE	--	
01	1/29/1998	BENZENE	--	
01	3/24/1999	BENZENE	--	
01	9/19/2001	BENZENE	--	
01	1/17/1995	BROMOBENZENE	--	
01	4/3/1995	BROMOBENZENE	--	
01	7/3/1995	BROMOBENZENE	--	
01	10/2/1995	BROMOBENZENE	--	
01	5/29/1996	BROMOBENZENE	--	
01	1/31/1997	BROMOBENZENE	--	
01	1/29/1998	BROMOBENZENE	--	
01	3/24/1999	BROMOBENZENE	--	
01	9/19/2001	BROMOBENZENE	--	
01	1/17/1995	BROMOCHLOROMETHANE	--	
01	4/3/1995	BROMOCHLOROMETHANE	--	
01	7/3/1995	BROMOCHLOROMETHANE	--	
01	10/2/1995	BROMOCHLOROMETHANE	--	
01	5/29/1996	BROMOCHLOROMETHANE	--	
01	1/31/1997	BROMOCHLOROMETHANE	--	
01	1/29/1998	BROMOCHLOROMETHANE	--	
01	3/24/1999	BROMOCHLOROMETHANE	--	
01	9/19/2001	BROMOCHLOROMETHANE	--	
01	7/3/1995	BROMODICHLOROMETHANE	--	
01	10/2/1995	BROMODICHLOROMETHANE	--	
01	5/29/1996	BROMODICHLOROMETHANE	--	
01	1/31/1997	BROMODICHLOROMETHANE	--	
01	1/29/1998	BROMODICHLOROMETHANE	--	
01	3/24/1999	BROMODICHLOROMETHANE	--	
01	9/19/2001	BROMODICHLOROMETHANE	--	
01	7/3/1995	BROMOFORM	--	

- --=Not Detected
NA=No Criteria
*=SDWR
^=DWEL
+=Drinking Water Adv Level

SUMMARY GOODWILL MENNONITE HOME, INC. WATER SAMPLE ANALYSIS

Plant ID	Sample Date	Contaminant Name	Result	MCL
Volatile Organic Compounds			µg/L	µg/L
01	10/2/1995	BROMOFORM	--	
01	5/29/1996	BROMOFORM	--	
01	1/31/1997	BROMOFORM	--	
01	1/29/1998	BROMOFORM	--	
01	3/24/1999	BROMOFORM	--	
01	9/19/2001	BROMOFORM	--	
01	1/17/1995	BROMOMETHANE	--	
01	4/3/1995	BROMOMETHANE	--	
01	7/3/1995	BROMOMETHANE	--	
01	10/2/1995	BROMOMETHANE	--	
01	5/29/1996	BROMOMETHANE	--	
01	1/31/1997	BROMOMETHANE	--	
01	1/29/1998	BROMOMETHANE	--	
01	3/24/1999	BROMOMETHANE	--	
01	9/19/2001	BROMOMETHANE	--	
01	1/17/1995	CARBON TETRACHLORIDE	--	
01	4/3/1995	CARBON TETRACHLORIDE	--	
01	7/3/1995	CARBON TETRACHLORIDE	--	
01	10/2/1995	CARBON TETRACHLORIDE	--	
01	5/29/1996	CARBON TETRACHLORIDE	--	
01	1/31/1997	CARBON TETRACHLORIDE	--	
01	1/29/1998	CARBON TETRACHLORIDE	--	
01	3/24/1999	CARBON TETRACHLORIDE	--	
01	9/19/2001	CARBON TETRACHLORIDE	--	
01	1/17/1995	CHLOROETHANE	--	
01	4/3/1995	CHLOROETHANE	--	
01	7/3/1995	CHLOROETHANE	--	
01	10/2/1995	CHLOROETHANE	--	
01	5/29/1996	CHLOROETHANE	--	
01	1/31/1997	CHLOROETHANE	--	
01	1/29/1998	CHLOROETHANE	--	
01	3/24/1999	CHLOROETHANE	0.7	NA
01	9/19/2001	CHLOROETHANE	--	
01	7/3/1995	CHLOROFORM	--	
01	10/2/1995	CHLOROFORM	--	
01	5/29/1996	CHLOROFORM	--	
01	1/31/1997	CHLOROFORM	--	
01	1/29/1998	CHLOROFORM	--	
01	3/24/1999	CHLOROFORM	--	
01	9/19/2001	CHLOROFORM	--	
01	1/17/1995	CHLOROMETHANE	--	
01	4/3/1995	CHLOROMETHANE	--	
01	7/3/1995	CHLOROMETHANE	--	
01	10/2/1995	CHLOROMETHANE	--	
01	5/29/1996	CHLOROMETHANE	--	
01	1/31/1997	CHLOROMETHANE	--	
01	1/29/1998	CHLOROMETHANE	--	

- -=Not Detected
NA=No Criteria
*=SDWR
^=DWEL
+=Drinking Water Adv Level

SUMMARY GOODWILL MENNONITE HOME, INC. WATER SAMPLE ANALYSIS

Plant ID	Sample Date	Contaminant Name	Result	MCL
Volatile Organic Compounds			µg/L	µg/L
01	3/24/1999	CHLOROMETHANE	--	
01	9/19/2001	CHLOROMETHANE	--	
01	1/17/1995	cis-1,2-DICHLOROETHYLENE	--	
01	4/3/1995	cis-1,2-DICHLOROETHYLENE	--	
01	7/3/1995	cis-1,2-DICHLOROETHYLENE	--	
01	10/2/1995	cis-1,2-DICHLOROETHYLENE	--	
01	5/29/1996	cis-1,2-DICHLOROETHYLENE	--	
01	1/31/1997	cis-1,2-DICHLOROETHYLENE	--	
01	1/29/1998	cis-1,2-DICHLOROETHYLENE	--	
01	3/24/1999	cis-1,2-DICHLOROETHYLENE	--	
01	9/19/2001	cis-1,2-DICHLOROETHYLENE	--	
01	7/3/1995	DIBROMOCHLOROMETHANE	--	
01	10/2/1995	DIBROMOCHLOROMETHANE	--	
01	5/29/1996	DIBROMOCHLOROMETHANE	--	
01	1/31/1997	DIBROMOCHLOROMETHANE	--	
01	1/29/1998	DIBROMOCHLOROMETHANE	--	
01	3/24/1999	DIBROMOCHLOROMETHANE	--	
01	9/19/2001	DIBROMOCHLOROMETHANE	--	
01	1/17/1995	DIBROMOMETHANE	--	
01	4/3/1995	DIBROMOMETHANE	--	
01	7/3/1995	DIBROMOMETHANE	--	
01	10/2/1995	DIBROMOMETHANE	--	
01	5/29/1996	DIBROMOMETHANE	--	
01	1/31/1997	DIBROMOMETHANE	--	
01	1/29/1998	DIBROMOMETHANE	--	
01	3/24/1999	DIBROMOMETHANE	--	
01	9/19/2001	DIBROMOMETHANE	--	
01	1/17/1995	DICHLORODIFLUOROMETHANE	--	
01	4/3/1995	DICHLORODIFLUOROMETHANE	--	
01	7/3/1995	DICHLORODIFLUOROMETHANE	--	
01	10/2/1995	DICHLORODIFLUOROMETHANE	--	
01	5/29/1996	DICHLORODIFLUOROMETHANE	--	
01	1/31/1997	DICHLORODIFLUOROMETHANE	--	
01	1/29/1998	DICHLORODIFLUOROMETHANE	--	
01	3/24/1999	DICHLORODIFLUOROMETHANE	--	
01	9/19/2001	DICHLORODIFLUOROMETHANE	--	
01	1/17/1995	ETHYLBENZENE	--	
01	4/3/1995	ETHYLBENZENE	--	
01	7/3/1995	ETHYLBENZENE	--	
01	10/2/1995	ETHYLBENZENE	--	
01	5/29/1996	ETHYLBENZENE	--	
01	1/31/1997	ETHYLBENZENE	--	
01	1/29/1998	ETHYLBENZENE	--	
01	3/24/1999	ETHYLBENZENE	--	
01	9/19/2001	ETHYLBENZENE	--	
01	1/17/1995	HEXACHLOROBUTADIENE	--	
01	4/3/1995	HEXACHLOROBUTADIENE	--	

- --=Not Detected
NA=No Criteria
*=SDWR
^=DWEL
+=Drinking Water Adv Level

SUMMARY GOODWILL MENNONITE HOME, INC. WATER SAMPLE ANALYSIS

Plant ID	Sample Date	Contaminant Name	Result	MCL
Volatile Organic Compounds			µg/L	µg/L
01	7/3/1995	HEXACHLOROBUTADIENE	--	
01	10/2/1995	HEXACHLOROBUTADIENE	--	
01	5/29/1996	HEXACHLOROBUTADIENE	--	
01	1/31/1997	HEXACHLOROBUTADIENE	--	
01	1/29/1998	HEXACHLOROBUTADIENE	--	
01	3/24/1999	HEXACHLOROBUTADIENE	--	
01	9/19/2001	HEXACHLOROBUTADIENE	--	
01	1/17/1995	ISOPROPYLBENZENE	--	
01	4/3/1995	ISOPROPYLBENZENE	--	
01	7/3/1995	ISOPROPYLBENZENE	--	
01	10/2/1995	ISOPROPYLBENZENE	--	
01	5/29/1996	ISOPROPYLBENZENE	--	
01	1/31/1997	ISOPROPYLBENZENE	--	
01	1/29/1998	ISOPROPYLBENZENE	--	
01	3/24/1999	ISOPROPYLBENZENE	--	
01	9/19/2001	ISOPROPYLBENZENE	--	
01	1/17/1995	m-DICHLOROBENZENE	--	
01	4/3/1995	m-DICHLOROBENZENE	--	
01	7/3/1995	m-DICHLOROBENZENE	--	
01	10/2/1995	m-DICHLOROBENZENE	--	
01	5/29/1996	m-DICHLOROBENZENE	--	
01	1/31/1997	m-DICHLOROBENZENE	--	
01	1/29/1998	m-DICHLOROBENZENE	--	
01	3/24/1999	m-DICHLOROBENZENE	--	
01	9/19/2001	m-DICHLOROBENZENE	--	
01	1/17/1995	METHYLENE CHLORIDE	--	
01	4/3/1995	METHYLENE CHLORIDE	--	
01	7/3/1995	METHYLENE CHLORIDE	--	
01	10/2/1995	METHYLENE CHLORIDE	--	
01	5/29/1996	METHYLENE CHLORIDE	--	
01	1/31/1997	METHYLENE CHLORIDE	--	
01	1/29/1998	METHYLENE CHLORIDE	--	
01	3/24/1999	METHYLENE CHLORIDE	--	
01	9/19/2001	METHYLENE CHLORIDE	--	
01	1/17/1995	METHYL-TERT-BUTYL-ETHER	--	
01	1/17/1995	METHYL-TERT-BUTYL-ETHER	--	
01	4/3/1995	METHYL-TERT-BUTYL-ETHER	--	
01	4/3/1995	METHYL-TERT-BUTYL-ETHER	--	
01	7/3/1995	METHYL-TERT-BUTYL-ETHER	--	
01	7/3/1995	METHYL-TERT-BUTYL-ETHER	--	
01	10/2/1995	METHYL-TERT-BUTYL-ETHER	--	
01	10/2/1995	METHYL-TERT-BUTYL-ETHER	--	
01	5/29/1996	METHYL-TERT-BUTYL-ETHER	--	
01	5/29/1996	METHYL-TERT-BUTYL-ETHER	--	
01	1/31/1997	METHYL-TERT-BUTYL-ETHER	--	
01	1/31/1997	METHYL-TERT-BUTYL-ETHER	--	
01	1/29/1998	METHYL-TERT-BUTYL-ETHER	--	

- -=Not Detected
NA=No Criteria
*=SDWR
^=DWEL
+=Drinking Water Adv Level

SUMMARY GOODWILL MENNONITE HOME, INC. WATER SAMPLE ANALYSIS

Plant ID	Sample Date	Contaminant Name	Result	MCL
Volatile Organic Compounds			µg/L	µg/L
01	1/29/1998	METHYL-TERT-BUTYL-ETHER	--	
01	3/24/1999	METHYL-TERT-BUTYL-ETHER	--	
01	3/24/1999	METHYL-TERT-BUTYL-ETHER	--	
01	9/19/2001	METHYL-TERT-BUTYL-ETHER	--	
01	9/19/2001	METHYL-TERT-BUTYL-ETHER	--	
01	1/17/1995	MONOCHLOROBENZENE	--	
01	4/3/1995	MONOCHLOROBENZENE	--	
01	7/3/1995	MONOCHLOROBENZENE	--	
01	10/2/1995	MONOCHLOROBENZENE	--	
01	5/29/1996	MONOCHLOROBENZENE	--	
01	1/31/1997	MONOCHLOROBENZENE	--	
01	1/29/1998	MONOCHLOROBENZENE	--	
01	3/24/1999	MONOCHLOROBENZENE	--	
01	9/19/2001	MONOCHLOROBENZENE	--	
01	1/17/1995	m-XYLENE	--	
01	4/3/1995	m-XYLENE	--	
01	7/3/1995	m-XYLENE	--	
01	10/2/1995	m-XYLENE	--	
01	5/29/1996	m-XYLENE	--	
01	1/31/1997	m-XYLENE	--	
01	3/24/1999	m-XYLENE	--	
01	9/19/2001	m-XYLENE	--	
01	1/17/1995	NAPHTHALENE	--	
01	4/3/1995	NAPHTHALENE	--	
01	7/3/1995	NAPHTHALENE	--	
01	10/2/1995	NAPHTHALENE	--	
01	5/29/1996	NAPHTHALENE	--	
01	1/31/1997	NAPHTHALENE	--	
01	1/29/1998	NAPHTHALENE	--	
01	3/24/1999	NAPHTHALENE	--	
01	9/19/2001	NAPHTHALENE	--	
01	1/17/1995	N-BUTYLBENZENE	--	
01	4/3/1995	N-BUTYLBENZENE	--	
01	7/3/1995	N-BUTYLBENZENE	--	
01	10/2/1995	N-BUTYLBENZENE	--	
01	5/29/1996	N-BUTYLBENZENE	--	
01	1/31/1997	N-BUTYLBENZENE	--	
01	1/29/1998	N-BUTYLBENZENE	--	
01	3/24/1999	N-BUTYLBENZENE	--	
01	9/19/2001	N-BUTYLBENZENE	--	
01	1/17/1995	n-PROPYLBENZENE	--	
01	4/3/1995	n-PROPYLBENZENE	--	
01	7/3/1995	n-PROPYLBENZENE	--	
01	10/2/1995	n-PROPYLBENZENE	--	
01	5/29/1996	n-PROPYLBENZENE	--	
01	1/31/1997	n-PROPYLBENZENE	--	
01	1/29/1998	n-PROPYLBENZENE	--	

- -=Not Detected
NA=No Criteria
*=SDWR
^=DWEL
+=Drinking Water Adv Level

SUMMARY GOODWILL MENNONITE HOME, INC. WATER SAMPLE ANALYSIS

Plant ID	Sample Date	Contaminant Name	Result	MCL
Volatile Organic Compounds			µg/L	µg/L
01	3/24/1999	n-PROPYLBENZENE	--	
01	9/19/2001	n-PROPYLBENZENE	--	
01	1/17/1995	o-CHLOROTOLUENE	--	
01	4/3/1995	o-CHLOROTOLUENE	--	
01	7/3/1995	o-CHLOROTOLUENE	--	
01	10/2/1995	o-CHLOROTOLUENE	--	
01	5/29/1996	o-CHLOROTOLUENE	--	
01	1/31/1997	o-CHLOROTOLUENE	--	
01	1/29/1998	o-CHLOROTOLUENE	--	
01	3/24/1999	o-CHLOROTOLUENE	--	
01	9/19/2001	o-CHLOROTOLUENE	--	
01	1/17/1995	o-DICHLOROBENZENE	--	
01	4/3/1995	o-DICHLOROBENZENE	--	
01	7/3/1995	o-DICHLOROBENZENE	--	
01	10/2/1995	o-DICHLOROBENZENE	--	
01	5/29/1996	o-DICHLOROBENZENE	--	
01	1/31/1997	o-DICHLOROBENZENE	--	
01	1/29/1998	o-DICHLOROBENZENE	--	
01	3/24/1999	o-DICHLOROBENZENE	--	
01	9/19/2001	o-DICHLOROBENZENE	--	
01	1/17/1995	o-XYLENE	--	
01	4/3/1995	o-XYLENE	--	
01	7/3/1995	o-XYLENE	--	
01	10/2/1995	o-XYLENE	--	
01	5/29/1996	o-XYLENE	--	
01	1/31/1997	o-XYLENE	--	
01	3/24/1999	o-XYLENE	--	
01	9/19/2001	o-XYLENE	--	
01	1/17/1995	p-CHLOROTOLUENE	--	
01	4/3/1995	p-CHLOROTOLUENE	--	
01	7/3/1995	p-CHLOROTOLUENE	--	
01	10/2/1995	p-CHLOROTOLUENE	--	
01	5/29/1996	p-CHLOROTOLUENE	--	
01	1/31/1997	p-CHLOROTOLUENE	--	
01	1/29/1998	p-CHLOROTOLUENE	--	
01	3/24/1999	p-CHLOROTOLUENE	--	
01	9/19/2001	p-CHLOROTOLUENE	--	
01	1/17/1995	p-DICHLOROBENZENE	--	
01	4/3/1995	p-DICHLOROBENZENE	--	
01	7/3/1995	p-DICHLOROBENZENE	--	
01	10/2/1995	p-DICHLOROBENZENE	--	
01	5/29/1996	p-DICHLOROBENZENE	--	
01	1/31/1997	p-DICHLOROBENZENE	--	
01	1/29/1998	p-DICHLOROBENZENE	--	
01	3/24/1999	p-DICHLOROBENZENE	--	
01	9/19/2001	p-DICHLOROBENZENE	--	
01	1/17/1995	P-ISOPROPYLTOLUENE	--	

- -=Not Detected
NA=No Criteria
*=SDWR
^=DWEL
+=Drinking Water Adv Level

SUMMARY GOODWILL MENNONITE HOME, INC. WATER SAMPLE ANALYSIS

Plant ID	Sample Date	Contaminant Name	Result	MCL
Volatile Organic Compounds			µg/L	µg/L
01	4/3/1995	P-ISOPROPYLTOLUENE	--	
01	7/3/1995	P-ISOPROPYLTOLUENE	--	
01	10/2/1995	P-ISOPROPYLTOLUENE	--	
01	5/29/1996	P-ISOPROPYLTOLUENE	--	
01	1/31/1997	P-ISOPROPYLTOLUENE	--	
01	1/29/1998	P-ISOPROPYLTOLUENE	--	
01	3/24/1999	P-ISOPROPYLTOLUENE	--	
01	9/19/2001	P-ISOPROPYLTOLUENE	--	
01	1/17/1995	p-XYLENE	--	
01	4/3/1995	p-XYLENE	--	
01	7/3/1995	p-XYLENE	--	
01	10/2/1995	p-XYLENE	--	
01	5/29/1996	p-XYLENE	--	
01	1/31/1997	p-XYLENE	--	
01	3/24/1999	p-XYLENE	--	
01	9/19/2001	p-XYLENE	--	
01	1/17/1995	SEC-BUTYLBENZENE	--	
01	4/3/1995	SEC-BUTYLBENZENE	--	
01	7/3/1995	SEC-BUTYLBENZENE	--	
01	10/2/1995	SEC-BUTYLBENZENE	--	
01	5/29/1996	SEC-BUTYLBENZENE	--	
01	1/31/1997	SEC-BUTYLBENZENE	--	
01	1/29/1998	SEC-BUTYLBENZENE	--	
01	3/24/1999	SEC-BUTYLBENZENE	--	
01	9/19/2001	SEC-BUTYLBENZENE	--	
01	1/17/1995	STYRENE	--	
01	4/3/1995	STYRENE	--	
01	7/3/1995	STYRENE	--	
01	10/2/1995	STYRENE	--	
01	5/29/1996	STYRENE	--	
01	1/31/1997	STYRENE	--	
01	1/29/1998	STYRENE	--	
01	3/24/1999	STYRENE	--	
01	9/19/2001	STYRENE	--	
01	1/17/1995	TERT-BUTYLBENZENE	--	
01	4/3/1995	TERT-BUTYLBENZENE	--	
01	7/3/1995	TERT-BUTYLBENZENE	--	
01	10/2/1995	TERT-BUTYLBENZENE	--	
01	5/29/1996	TERT-BUTYLBENZENE	--	
01	1/31/1997	TERT-BUTYLBENZENE	--	
01	1/29/1998	TERT-BUTYLBENZENE	--	
01	3/24/1999	TERT-BUTYLBENZENE	--	
01	9/19/2001	TERT-BUTYLBENZENE	--	
01	1/17/1995	TETRACHLOROETHYLENE	--	
01	4/3/1995	TETRACHLOROETHYLENE	--	
01	7/3/1995	TETRACHLOROETHYLENE	--	
01	10/2/1995	TETRACHLOROETHYLENE	--	

- -=Not Detected
NA=No Criteria
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SUMMARY GOODWILL MENNONITE HOME, INC. WATER SAMPLE ANALYSIS

Plant ID	Sample Date	Contaminant Name	Result	MCL
Volatile Organic Compounds			µg/L	µg/L
01	5/29/1996	TETRACHLOROETHYLENE	--	
01	1/31/1997	TETRACHLOROETHYLENE	--	
01	1/29/1998	TETRACHLOROETHYLENE	--	
01	3/24/1999	TETRACHLOROETHYLENE	--	
01	9/19/2001	TETRACHLOROETHYLENE	--	
01	1/17/1995	TOLUENE	--	
01	4/3/1995	TOLUENE	--	
01	7/3/1995	TOLUENE	--	
01	10/2/1995	TOLUENE	--	
01	5/29/1996	TOLUENE	--	
01	1/31/1997	TOLUENE	--	
01	1/29/1998	TOLUENE	--	
01	3/24/1999	TOLUENE	--	
01	9/19/2001	TOLUENE	--	
01	1/17/1995	trans-1,2-DICHLOROETHYLENE	--	
01	4/3/1995	trans-1,2-DICHLOROETHYLENE	--	
01	7/3/1995	trans-1,2-DICHLOROETHYLENE	--	
01	10/2/1995	trans-1,2-DICHLOROETHYLENE	--	
01	5/29/1996	trans-1,2-DICHLOROETHYLENE	--	
01	1/31/1997	trans-1,2-DICHLOROETHYLENE	--	
01	1/29/1998	trans-1,2-DICHLOROETHYLENE	--	
01	3/24/1999	trans-1,2-DICHLOROETHYLENE	--	
01	9/19/2001	trans-1,2-DICHLOROETHYLENE	--	
01	1/17/1995	TRICHLOROETHYLENE	--	
01	4/3/1995	TRICHLOROETHYLENE	--	
01	7/3/1995	TRICHLOROETHYLENE	--	
01	10/2/1995	TRICHLOROETHYLENE	--	
01	5/29/1996	TRICHLOROETHYLENE	--	
01	1/31/1997	TRICHLOROETHYLENE	--	
01	1/29/1998	TRICHLOROETHYLENE	--	
01	3/24/1999	TRICHLOROETHYLENE	--	
01	9/19/2001	TRICHLOROETHYLENE	--	
01	1/17/1995	TRICHLOROFLUOROMETHANE	--	
01	4/3/1995	TRICHLOROFLUOROMETHANE	--	
01	7/3/1995	TRICHLOROFLUOROMETHANE	--	
01	10/2/1995	TRICHLOROFLUOROMETHANE	--	
01	5/29/1996	TRICHLOROFLUOROMETHANE	--	
01	1/31/1997	TRICHLOROFLUOROMETHANE	--	
01	1/29/1998	TRICHLOROFLUOROMETHANE	--	
01	3/24/1999	TRICHLOROFLUOROMETHANE	--	
01	9/19/2001	TRICHLOROFLUOROMETHANE	--	
01	1/17/1995	VINYL CHLORIDE	--	
01	4/3/1995	VINYL CHLORIDE	--	
01	7/3/1995	VINYL CHLORIDE	--	
01	10/2/1995	VINYL CHLORIDE	--	
01	5/29/1996	VINYL CHLORIDE	--	
01	1/31/1997	VINYL CHLORIDE	--	

- -=Not Detected
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SUMMARY GOODWILL MENNONITE HOME, INC. WATER SAMPLE ANALYSIS

Plant ID	Sample Date	Contaminant Name	Result	MCL
Volatile Organic Compounds			µg/L	µg/L
01	1/29/1998	VINYL CHLORIDE	--	
01	3/24/1999	VINYL CHLORIDE	--	
01	9/19/2001	VINYL CHLORIDE	--	
01	1/17/1995	XYLENES, TOTAL	--	
01	4/3/1995	XYLENES, TOTAL	--	
01	7/3/1995	XYLENES, TOTAL	--	
01	10/2/1995	XYLENES, TOTAL	--	
01	5/29/1996	XYLENES, TOTAL	--	
01	1/31/1997	XYLENES, TOTAL	--	
01	1/29/1998	XYLENES, TOTAL	--	
01	3/24/1999	XYLENES, TOTAL	--	
01	9/19/2001	XYLENES, TOTAL	--	
Synthetic Organic Compounds			µg/L	µg/L
01	1/17/1995	1,2-DIBROMO-3-CHLOROPROPANE	--	
01	4/3/1995	1,2-DIBROMO-3-CHLOROPROPANE	--	
01	7/3/1995	1,2-DIBROMO-3-CHLOROPROPANE	--	
01	10/2/1995	1,2-DIBROMO-3-CHLOROPROPANE	--	
01	5/20/1996	1,2-DIBROMO-3-CHLOROPROPANE	--	
01	5/29/1996	1,2-DIBROMO-3-CHLOROPROPANE	--	
01	1/31/1997	1,2-DIBROMO-3-CHLOROPROPANE	--	
01	1/29/1998	1,2-DIBROMO-3-CHLOROPROPANE	--	
01	3/24/1999	1,2-DIBROMO-3-CHLOROPROPANE	--	
01	3/10/1993	2,4,5-T	--	
01	5/20/1996	2,4,5-T	--	
01	3/24/1999	2,4,5-T	--	
01	3/10/1993	2,4,5-TP (SILVEX)	--	
01	5/20/1996	2,4,5-TP (SILVEX)	--	
01	3/24/1999	2,4,5-TP (SILVEX)	--	
01	3/10/1993	2,4-D	--	
01	5/20/1996	2,4-D	--	
01	3/24/1999	2,4-D	--	
01	3/24/1999	3-HYDROXYCARBOFURAN	--	
01	3/10/1993	ALACHLOR (LASSO)	--	
01	5/20/1996	ALACHLOR (LASSO)	--	
01	3/24/1999	ALACHLOR (LASSO)	--	
01	3/24/1999	ALDICARB	--	
01	3/24/1999	ALDICARB SULFONE	--	
01	3/24/1999	ALDICARB SULFOXIDE	--	
01	3/10/1993	ALDRIN	--	
01	5/20/1996	ALDRIN	--	
01	3/24/1999	ALDRIN	--	
01	3/10/1993	ATRAZINE	--	
01	5/20/1996	ATRAZINE	--	
01	3/24/1999	ATRAZINE	--	
01	5/20/1996	BENZO(a)PYRENE	--	
01	3/24/1999	BENZO(a)PYRENE	--	
01	3/10/1993	BHC-GAMMA(LINDANE)	--	

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SUMMARY GOODWILL MENNONITE HOME, INC. WATER SAMPLE ANALYSIS

Plant ID	Sample Date	Contaminant Name	Result	MCL
Synthetic Organic Compounds			µg/L	µg/L
01	5/20/1996	BHC-GAMMA(LINDANE)	--	
01	3/24/1999	BHC-GAMMA(LINDANE)	--	
01	3/10/1993	BUTACHLOR (MACHETE)	--	
01	5/20/1996	BUTACHLOR (MACHETE)	--	
01	3/24/1999	BUTACHLOR (MACHETE)	--	
01	3/24/1999	CARBARYL	--	
01	3/24/1999	CARBOFURAN	--	
01	3/10/1993	CHLORDANE	--	
01	5/20/1996	CHLORDANE	--	
01	3/24/1999	CHLORDANE	--	
01	3/10/1993	DALAPON	--	
01	5/20/1996	DALAPON	--	
01	3/24/1999	DALAPON	0.16	200
01	3/10/1993	DECACHLOROBIPHENYL	--	
01	5/20/1996	DECACHLOROBIPHENYL	--	
01	5/20/1996	DI(2-ETHYLHEXYL) ADIPATE	--	
01	3/24/1999	DI(2-ETHYLHEXYL) ADIPATE	--	
01	5/20/1996	DI(2-ETHYLHEXYL) PHTHALATE	--	
01	3/24/1999	DI(2-ETHYLHEXYL) PHTHALATE	--	
01	3/10/1993	DIAZINON (SPECTRACIDE)	--	
01	5/20/1996	DIAZINON (SPECTRACIDE)	--	
01	3/10/1993	DICAMBA	--	
01	5/20/1996	DICAMBA	--	
01	3/24/1999	DICAMBA	--	
01	3/10/1993	DIELDRIN	--	
01	5/20/1996	DIELDRIN	--	
01	3/24/1999	DIELDRIN	--	
01	3/10/1993	DINOSEB	--	
01	5/20/1996	DINOSEB	--	
01	3/24/1999	DINOSEB	--	
01	3/10/1993	DURSBAN	--	
01	5/20/1996	DURSBAN	--	
01	3/10/1993	ENDRIN	--	
01	5/20/1996	ENDRIN	--	
01	3/24/1999	ENDRIN	--	
01	1/17/1995	ETHYLENE DIBROMIDE (EDB)	--	
01	4/3/1995	ETHYLENE DIBROMIDE (EDB)	--	
01	7/3/1995	ETHYLENE DIBROMIDE (EDB)	--	
01	10/2/1995	ETHYLENE DIBROMIDE (EDB)	--	
01	5/20/1996	ETHYLENE DIBROMIDE (EDB)	--	
01	5/29/1996	ETHYLENE DIBROMIDE (EDB)	--	
01	1/31/1997	ETHYLENE DIBROMIDE (EDB)	--	
01	1/29/1998	ETHYLENE DIBROMIDE (EDB)	--	
01	3/24/1999	ETHYLENE DIBROMIDE (EDB)	--	
01	3/10/1993	HEPTACHLOR	--	
01	5/20/1996	HEPTACHLOR	--	
01	3/24/1999	HEPTACHLOR	--	

- -=Not Detected
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SUMMARY GOODWILL MENNONITE HOME, INC. WATER SAMPLE ANALYSIS

Plant ID	Sample Date	Contaminant Name	Result	MCL
Synthetic Organic Compounds			µg/L	µg/L
01	3/10/1993	HEPTACHLOR EPOXIDE	--	
01	5/20/1996	HEPTACHLOR EPOXIDE	--	
01	3/24/1999	HEPTACHLOR EPOXIDE	--	
01	5/20/1996	HEXACHLOROBENZENE (HCB)	--	
01	3/24/1999	HEXACHLOROBENZENE (HCB)	--	
01	3/10/1993	HEXACHLOROCYCLOPENTADIENE	--	
01	5/20/1996	HEXACHLOROCYCLOPENTADIENE	--	
01	3/24/1999	HEXACHLOROCYCLOPENTADIENE	--	
01	3/24/1999	METHOMYL	--	
01	3/10/1993	METHOXYCHLOR	--	
01	5/20/1996	METHOXYCHLOR	--	
01	3/24/1999	METHOXYCHLOR	--	
01	3/10/1993	METOLACHLOR	--	
01	5/20/1996	METOLACHLOR	--	
01	3/24/1999	METOLACHLOR	--	
01	3/10/1993	METRIBUZIN (SENCOR)	--	
01	5/20/1996	METRIBUZIN (SENCOR)	--	
01	3/24/1999	METRIBUZIN (SENCOR)	--	
01	3/24/1999	OXAMYL (VYDATE)	--	
01	3/10/1993	PENTACHLOROPHENOL	--	
01	5/20/1996	PENTACHLOROPHENOL	--	
01	3/24/1999	PENTACHLOROPHENOL	--	
01	3/10/1993	PICLORAM	--	
01	5/20/1996	PICLORAM	--	
01	3/24/1999	PICLORAM	--	
01	3/10/1993	PROPACHLOR (RAMROD)	--	
01	5/20/1996	PROPACHLOR (RAMROD)	--	
01	3/24/1999	PROPACHLOR (RAMROD)	--	
01	3/10/1993	SIMAZINE	--	
01	5/20/1996	SIMAZINE	--	
01	3/24/1999	SIMAZINE	--	
01	3/10/1993	TOXAPHENE	--	
01	5/20/1996	TOXAPHENE	--	
Radionuclides			pCi/L	pCi/L
00	10/2/1995	GROSS ALPHA	1.4	15
01	3/24/1999	GROSS ALPHA	--	
01	3/24/1999	GROSS ALPHA (SHORT TERM)	--	
00	10/2/1995	GROSS BETA	--	
01	3/24/1999	GROSS BETA	--	
01	3/24/1999	GROSS BETA (SHORT TERM)	--	
01	6/23/1999	RADON-222	95	300
Inorganic Compounds			mg/L	mg/L
01	5/20/1996	ANTIMONY	--	
01	3/24/1999	ANTIMONY	--	
01	9/19/2001	ANTIMONY	--	
01	5/20/1996	ARSENIC	--	
01	10/16/1996	ARSENIC	--	

- -=Not Detected
NA=No Criteria
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SUMMARY GOODWILL MENNONITE HOME, INC. WATER SAMPLE ANALYSIS

Plant ID	Sample Date	Contaminant Name	Result	MCL
Inorganic Compounds			mg/L	mg/L
01	3/24/1999	ARSENIC	--	
01	9/19/2001	ARSENIC	--	
01	5/20/1996	BARIUM	--	
01	3/24/1999	BARIUM	--	
01	9/19/2001	BARIUM	0.15	2
01	5/20/1996	BERYLLIUM	--	
01	3/24/1999	BERYLLIUM	--	
01	9/19/2001	BERYLLIUM	--	
01	5/20/1996	CADMIUM	--	
01	3/24/1999	CADMIUM	--	
01	9/19/2001	CADMIUM	--	
01	9/19/2001	CALCIUM	45.8	NA
01	9/19/2001	CHLORIDE	13	250 *
01	5/20/1996	CHROMIUM	--	
01	3/24/1999	CHROMIUM	--	
01	9/19/2001	CHROMIUM	--	
01	10/25/1995	FLUORIDE	0.12	4
01	5/20/1996	FLUORIDE	0.15	4
01	3/24/1999	FLUORIDE	0.12	4
01	9/19/2001	FLUORIDE	--	
01	9/19/2001	IRON	0.68	0.3 *
01	9/19/2001	MANGANESE	0.05	0.05 *
01	5/20/1996	MERCURY	--	
01	3/24/1999	MERCURY	--	
01	9/19/2001	MERCURY	--	
01	5/20/1996	NICKEL	--	
01	3/24/1999	NICKEL	--	
01	9/19/2001	NICKEL	--	
01	12/22/1993	NITRATE	3.8	10
01	12/14/1994	NITRATE	3.1	10
01	10/25/1995	NITRATE	1.2	10
01	5/20/1996	NITRATE	1.7	10
01	10/16/1996	NITRATE	1.6	10
01	11/11/1997	NITRATE	1.1	10
01	9/21/1998	NITRATE	0.9	10
01	9/21/1998	NITRATE	0.9	10
01	3/24/1999	NITRATE	1.7	10
01	9/13/1999	NITRATE	1.8	10
01	1/26/2000	NITRATE	1.6	10
01	1/4/2001	NITRATE	1.6	10
01	9/19/2001	NITRATE	1.53	10
01	12/18/2001	NITRATE	1.2	10
01	1/30/2002	NITRATE	2.8	10
01	10/25/1995	NITRITE	--	
01	5/20/1996	NITRITE	0.003	1
01	5/20/1996	SELENIUM	--	
01	3/24/1999	SELENIUM	--	

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SUMMARY GOODWILL MENNONITE HOME, INC. WATER SAMPLE ANALYSIS

Plant ID	Sample Date	Contaminant Name	Result	MCL
Inorganic Compounds			mg/L	mg/L
01	9/19/2001	SELENIUM	--	
01	3/24/1999	SODIUM	120	60 +
01	9/19/2001	SODIUM	2.2	60 +
01	5/20/1996	SULFATE	26.8	250 +
01	3/24/1999	SULFATE	31.9	250 +
01	9/19/2001	SULFATE	--	
01	5/20/1996	THALLIUM	--	
01	3/24/1999	THALLIUM	--	
01	9/19/2001	THALLIUM	--	
01	9/19/2001	ZINC	--	
General Water Quality Parameters				
01	9/19/2001	ALKALINITY, TOTAL	131	
01	9/19/2001	HARDNESS, TOTAL (AS CAC03)	158	
01	5/20/1996	pH	6.9	6.5-8.5 *
01	9/19/2001	pH	7.6	6.5-8.5 *
01	9/19/2001	TOTAL DISSOLVED SOLIDS (TDS)	188	

- -=Not Detected
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SUMMARY OF MICROBILOGICAL CONTAMINANT ANALYSIS FOR GOODWILL MENNONITE HOME WATER SAMPLES

Sample Date	Samples Taken	Total Coliform	Total Fecal	Total Indeterminate	Sample Repeats	Repeat Coliforms	Repeat Fecal	Repeat Indeterminate
1/1/1997	1	0	0	0	--	--	--	--
2/1/1997	1	0	0	0	--	--	--	--
3/1/1997	1	0	0	0	--	--	--	--
4/1/1997	1	0	0	0	--	--	--	--
5/1/1997	1	0	0	0	--	--	--	--
6/1/1997	1	0	0	0	--	--	--	--
7/1/1997	1	0	0	0	--	--	--	--
8/1/1997	1	0	0	0	--	--	--	--
9/1/1997	1	0	0	0	--	--	--	--
10/1/1997	1	0	0	0	--	--	--	--
11/1/1997	1	0	0	0	--	--	--	--
12/1/1997	1	0	0	0	--	--	--	--
1/1/1998	1	0	0	0	--	--	--	--
2/1/1998	1	0	0	0	--	--	--	--
3/1/1998	1	0	0	0	--	--	--	--
4/1/1998	1	0	0	0	--	--	--	--
5/1/1998	1	0	0	0	--	--	--	--
6/1/1998	1	0	0	0	--	--	--	--
7/1/1998	1	0	0	0	--	--	--	--
8/1/1998	1	0	0	0	--	--	--	--
9/1/1998	1	0	0	0	--	--	--	--
10/1/1998	1	0	0	0	--	--	--	--
11/1/1998	1	0	0	0	--	--	--	--
12/1/1998	1	0	0	0	--	--	--	--
1/1/1999	1	0	0	0	--	--	--	--
2/1/1999	1	0	0	0	--	--	--	--
3/1/1999	1	0	0	0	--	--	--	--
4/1/1999	1	0	0	0	--	--	--	--
5/1/1999	1	0	0	0	--	--	--	--
6/1/1999	1	0	0	0	--	--	--	--
7/1/1999	1	0	0	0	--	--	--	--
8/1/1999	1	0	0	0	--	--	--	--
9/1/1999	1	0	0	0	--	--	--	--
10/1/1999	1	0	0	0	--	--	--	--
11/1/1999	1	0	0	0	--	--	--	--
12/1/1999	1	0	0	0	--	--	--	--
1/1/2000	1	0	0	0	--	--	--	--
2/1/2000	1	0	0	0	--	--	--	--
3/1/2000	1	0	0	0	--	--	--	--
4/1/2000	1	0	0	0	--	--	--	--

-- = not applicable 0 = not detected

SUMMARY OF MICROBILOGICAL CONTAMINANT ANALYSIS FOR GOODWILL MENNONITE HOME WATER SAMPLES

Sample Date	Samples Taken	Total Coliform	Total Fecal	Total Indeterminate	Sample Repeats	Repeat Coliforms	Repeat Fecal	Repeat Indeterminate
5/1/2000	1	0	0	0	--	--	--	--
6/1/2000	1	0	0	0	--	--	--	--
7/1/2000	1	0	0	0	--	--	--	--
8/1/2000	1	0	0	0	--	--	--	--
9/1/2000	1	0	0	0	--	--	--	--
10/1/2000	1	0	0	0	--	--	--	--
11/1/2000	1	0	0	0	--	--	--	--
12/1/2000	1	0	0	0	--	--	--	--
1/1/2001	1	0	0	0	--	--	--	--
2/1/2001	1	0	0	0	--	--	--	--
3/1/2001	1	0	0	0	--	--	--	--
4/1/2001	1	0	0	0	--	--	--	--
5/1/2001	1	0	0	0	--	--	--	--
6/1/2001	1	0	0	0	--	--	--	--
7/1/2001	1	0	0	0	--	--	--	--
8/1/2001	1	0	0	0	--	--	--	--
9/1/2001	1	0	0	0	--	--	--	--
10/1/2001	1	0	0	0	--	--	--	--
11/1/2001	1	0	0	0	--	--	--	--
12/1/2001	1	0	0	0	--	--	--	--
1/1/2002	1	0	0	0	--	--	--	--
2/1/2002	1	0	0	0	--	--	--	--
3/1/2002	1	0	0	0	--	--	--	--
4/1/2002	1	0	0	0	--	--	--	--
5/1/2002	1	0	0	0	--	--	--	--
6/1/2002	1	0	0	0	--	--	--	--
7/1/2002	1	0	0	0	--	--	--	--
8/1/2002	1	0	0	0	--	--	--	--

-- = not applicable 0 = not detected