Final

Source Water Assessment

for the

Town & Country Mobile Home Park Water System

Cecil 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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May 2003

Project No. 61726.01

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May 2003

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CHS	Controlled Hazardous Substances
CCL	Contaminant Candidate List
COMAR	Code of Maryland Regulations
DWEL	Drinking Water Equivalent Level
ft	Foot/Feet
gal	Gallon(s)
gpd	Gallon(s) Per Day
gpm	Gallon(s) Per Minute
GPS	Global Positioning System
GPTRAC	General Particle Tracking
GWUDI	Ground Water Under Direct Influence
IOC	Inorganic Compound
L	Liter(s)
LUST	Leaking Underground Storage Tank
MCL	Maximum Contaminant Level
MDE	Maryland Department of the Environment
mg	Milligram(s)
MGS	Maryland Geological Survey
MHP	Mobile Home Park
MTBE	Methyl-tert butyl-ether
PCB	Polychlorinated Biphenyls
pCi	Picocurie(s)
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
TCE	Trichloroethene

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

µg	Microgram(s)
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WHPA	Wellhead Protection Area

EXECUTIVE SUMMARY

EA Engineering, Science, and Technology was tasked to perform a Source Water Assessment for the Town & Country Mobile Home Park (MHP) water system in Cecil County, Maryland. This water system is identified as Public Water System Identification (PWSID) 0070235 by the Maryland Department of the Environment (MDE). EA has performed this study under Purchase Order No. U00P3200205, 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 Town & Country MHP's water supply is the Patapsco Formation, which is an unconfined Coastal Plain unconsolidated aquifer. The Source Water Protection Area (SWPA) for the three ground-water supply wells was delineated using the Wellhead Protection Area (WHPA) Code for unconfined, unconsolidated aquifers. Each of the three one-year-time-of travel SWPA is 18 acres and the ten-year-time-of-travel SWPA is 281 acres.

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, potential polychlorinated biphenyl (PCB) electricity transformers, and two automobile repair facilities were observed in or near the SWPA. Forests account for a majority of the 10-year-time of travel SWPA and is not generally considered a non-point source of contaminants. Well information and water quality data were also reviewed.

The susceptibility analysis for the Town & Country MHP 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 Town & Country MHP water supply is moderately susceptible to volatile organic compounds, synthetic organic compounds, and radon-222; and has a low susceptibility to inorganic compounds, other radionuclides, and microbiological contaminants.

Recommendations to protect the ground-water supply include creating a SWPA protection 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 Town & Country Mobile Home Park (MHP) water system in Cecil County, Maryland. EA has performed this study under Purchase Order No. U00P3200205, as authorized by the Maryland Department of the Environment (MDE).

The Town & Country MHP water system serves the communities of Town & Country Estates in Cecil County. The water treatment plant and the supply wells for the system are located within the development. The Town & Country MHP water system serves a population of 450 with 164 connections. The water is supplied by three wells (Figure 1).

1.1 GROUND-WATER SUPPLY SYSTEM INFORMATION

A review of the well data and sanitary surveys of the system indicates that well number 3 was drilled in 1974, in accordance with the State's current well construction standards, which were implemented in 1973. Each of the wells was located within separate pump houses. Each well was observed to be completed above grade and secure. Each wellhead was observed to be in good repair and secure with the exception of small cracks in the concrete floor around Well 1 were observed. The wells have a total average yield of 36,000 gallons per day (gpd). The individual pumping rates of wells are unknown. Table 1 below contains a summary of the well construction data.

TABLE 1. WELL INFORMATION

Source ID	Source Name	Permit No.	Total Depth (ft)	Casing Depth (ft)	Aquifer
01	Town & Country 1	Unknown	42	Unknown	Patapsco Formation
02	Town & Country 2	CE660547	71	45	Patapsco Formation
03	Town & Country 3 (back-up)	CE731092	50	40	Patapsco Formation

According to the MDE Public Water Supply Inspection Report for the water system dated January 2002, the operator of the water system is Charles E. Davidson.

Currently, the raw ground water is treated with sodium carbonate (soda ash) for corrosion control. The finished water is stored in one 15-gal bladder tank, two 500-gal hydropneumatic tanks, and one 10,000-gal hydropneumatic tank prior to distribution.

1.2 HYDROGEOLOGY

Cecil County has two distinct physiographic provinces, the Piedmont and the Atlantic Coastal Plain, divided by the Fall Line. In the northern third of the county, Precambrian to early Paleozoic crystalline igneous and metamorphic rock of the Piedmont province are exposed at the surface. In the southern two-thirds of the county, the crystalline rocks are overlain by Coastal Plain deposits consisting largely of unconsolidated pebbly sand, sand, sandy clay, and clay. The deposits form a wedge-shaped mass of materials that range in thickness from inches along the Fall Line to as much as 1,600 ft in the southeastern corner of the County (Overbeck et al. 1958).

The ground water used by the Town & Country MHP is from production wells drilled into the Patapsco Formation. The Patapsco Formation is described as "gray, brown, and red variegated silts and clays; lenticular, cross-bedded, argillaceous, subrounded sands; minor gravels" [Maryland Geological Survey (MGS) 1968].

The source of the ground water in Cecil County is from precipitation in the form of rainfall or snow melt (Otton et al. 1988). The ground water in the sands of the Coastal Plain resides in between the grains of the unconsolidated sediment. The water table in the aquifer generally mimics the surface topography. Yields of wells in the Potomac Group, of which the Patapsco Formation is part, range from 0.5 to 703 gallons per minute (gpm) and the median is 30 gpm. Specific capacities range from less than 0.1 to 40 gallons per minute per foot of drawdown and the median is 1.1 gallons per minute per foot of drawdown.

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 assessment area for the system. Consistent with the recommended delineation in the Maryland SWAP (MDE 1999) for an unconfined Coastal Plain aquifer such as the Patapsco Formation, the USEPA WHPA Code Version 2.0 was utilized. To provide the greatest resolution for the modeling efforts, the semi-analytical General Particle Tracking (GPTRAC) Module was selected. Per the MDE SWAP guidance, a 1-year time-of-travel and a 10-year-time-of-travel were assessed.

The semi-analytical GPTRAC module delineates time-related capture zones for pumping wells in homogenous aquifers with steady state and uniform ambient ground-water flow. Effects of well interference are accounted for in this module (USEPA 1991).

The GPTRAC module requires the following inputs:

- Transmissivity in ft^2/day
- Ground-water withdrawal rate in ft^3/day
- Ground-water gradient (ft/ft)
- Ground-water flow angle (degrees)
- Aquifer thickness (ft)

The value used for Transmissivity (735 ft^2/day) was chosen based on the average transmissivity values (720 ft^2/day) from pumping tests in Elkton (Otton et al. 1988), the average specific capacity value (3.7 gpm/ft * 192.5 = 715 ft^2/day) from Elkton pumping tests (Overbeck et al. 1958), and average transmissivity values from the U.S. Geological Survey (USGS) website for the Potomac aquifer (approximately 1,000 ft^2/day).

The current Water Appropriation Permit rate issued by the MDE Water Rights Division for the total ground water withdrawal is 36,000 gpd or 4,813 ft^3/day. This value was used as the ground water withdrawal rate in the WHPA Code.

The ground-water gradient of 0.0005 ft/ft was used from a data interpretation from historical ground-water levels (Willey et al. 1987).

A ground-water flow angle of 225 degrees, which is a southwest direction, was selected. This is based on the regional ground-water flow direction towards the Northeast River.

Aquifer thickness for each well was based on the total depth minus the bottom of steel casing. The values for total depth and bottom of casing are shown in Table 1.

The capture zones from the WHPA Code model efforts for both the one and 10-year time-of-travel scenarios are shown on Figure 2. Each of the 1-year-time-of-travel capture zones is approximately 18 acres. The 10-year-time-of-travel capture zone is approximately 281 acres.

3. INVENTORY OF POTENTIAL CONTAMINANTS WITHIN THE DELINEATED AREA

A field survey was performed on 5 November 2002 to confirm potential sources of contamination identified in MDE databases near the ground-water wells. These databases include the Comprehensive Environmental Response, Compensation, and Liability Act Information System (CERCLIS), which includes National Priority List (Superfund) sites, Maryland Registered Underground Storage Tank (UST) sites, Maryland Leaking Underground Storage Tank (LUST) sites, landfills, pesticide dealers, ground-water discharge permits, Colonial Tanks, and Controlled Hazard 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

Nine pole-mounted electrical transformers were identified within the development and within the 10 year-time-of-travel delineation area. One transformer is located within each 1-year-time-of-travel delineation area of each of the three wells. Prior to 1977, many transformers contained polychlorinated biphenyls (PCB) fluid as an insulator. It is possible that the transformers onsite contain PCBs. If the transformer leaks, the PCB oil could eventually leach through the soil overburden into the ground-water aquifer.

Septic system drain fields were observed on-site. Septic system discharge could contain contaminants if there is insufficient treatment of biological contaminants such as coliforms and inorganic compounds such as nitrogen. Septic system discharge could also contain contaminants that the systems were not designed to treat, such as solvents and fuels.

In addition to the above-stated point sources of contamination within the delineation zone, two auto repair facilities exist along Route 40 that are just outside the delineation area to the south.

3.2 NON-POINT SOURCES

Using the Maryland Office of Planning's 2000 Land Use/Land Cover map for Cecil County, potential non-point sources within the SWPA area were also evaluated by land use designation. This assessment was performed by overlaying the SWPA shape on the land use coverage layer in ArcView GIS (Figure 3). A summary of the percent and acreage of each type of land use is presented in Table 2.

TABLE 2. SUMMARY OF LAND USE IN THE SOURCE WATER PROTECTION AREA OF TOWN AND COUNTRY MOBILE HOME PARK

	1-Year Time-of-Travel						10-Year Time-of-Travel	
Well Number	1		2		3		1,2,3	
	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres
Low Density Residential	0.0	0.0	0.0	0.0	1.4	0.3	6.5	18.4
Medium Density Residential	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
High Density Residential	41.9	7.6	5.3	1.0	13.6	2.4	11.2	31.4
Commercial	30.9	5.6	62.8	11.4	0.0	0.0	19.7	55.6
Cropland	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.71
Pasture	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forest	27.2	4.9	31.9	5.8	85.0	15.3	62.3	175.4
Feeding Operations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Acreage		18.1		18.1		18.0		281.5

From an interpretation of Table 2, high-density residential (7.6 acres) and commercial (5.6 acres) areas accounts for a majority of the 1-year time-of-travel SWPA for well No. 1 (18 acres). Commercial (11.4 acres) and forests (5.8 acres) account for the majority of the 1-year time-of-travel SWPA for well No. 2 (18 acres). Forest (15 acres) accounts for a majority of the 1-year time-of-travel SPWA for well No. 3. Non-point sources of pollution from residential areas could include lawn pesticides, fertilizers, and septic systems. Potential sources of contamination in commercial areas are identified in Section 3.1, Point Sources. Therefore, there is some potential for the migration of potential contaminants from non-point sources into the ground water in the 1 year-time-of-travel SWPA.

Forest areas (175 acres) account for a majority of the 10-year-time-of-travel SWPA (281 acres). The only non-point source of pollution generally associated with forests is from logging activities. Therefore, there is little to no potential for the migration of potential contaminants from non-point sources into the ground water in the 10-year-time-of-travel SWPA.

Using the 1993 Maryland Office of Planning's Cecil County sewerage coverage, potential non-point sources from other septic system users in the SWPA were assessed (Figure 4). By overlaying the SWPA on the sewerage coverage layer in ArcView GIS, it was determined that approximately 78 percent of the 10 year-time-of-travel SWPA does not have public sewer service while 22 percent is either on public sewer service or is under construction.

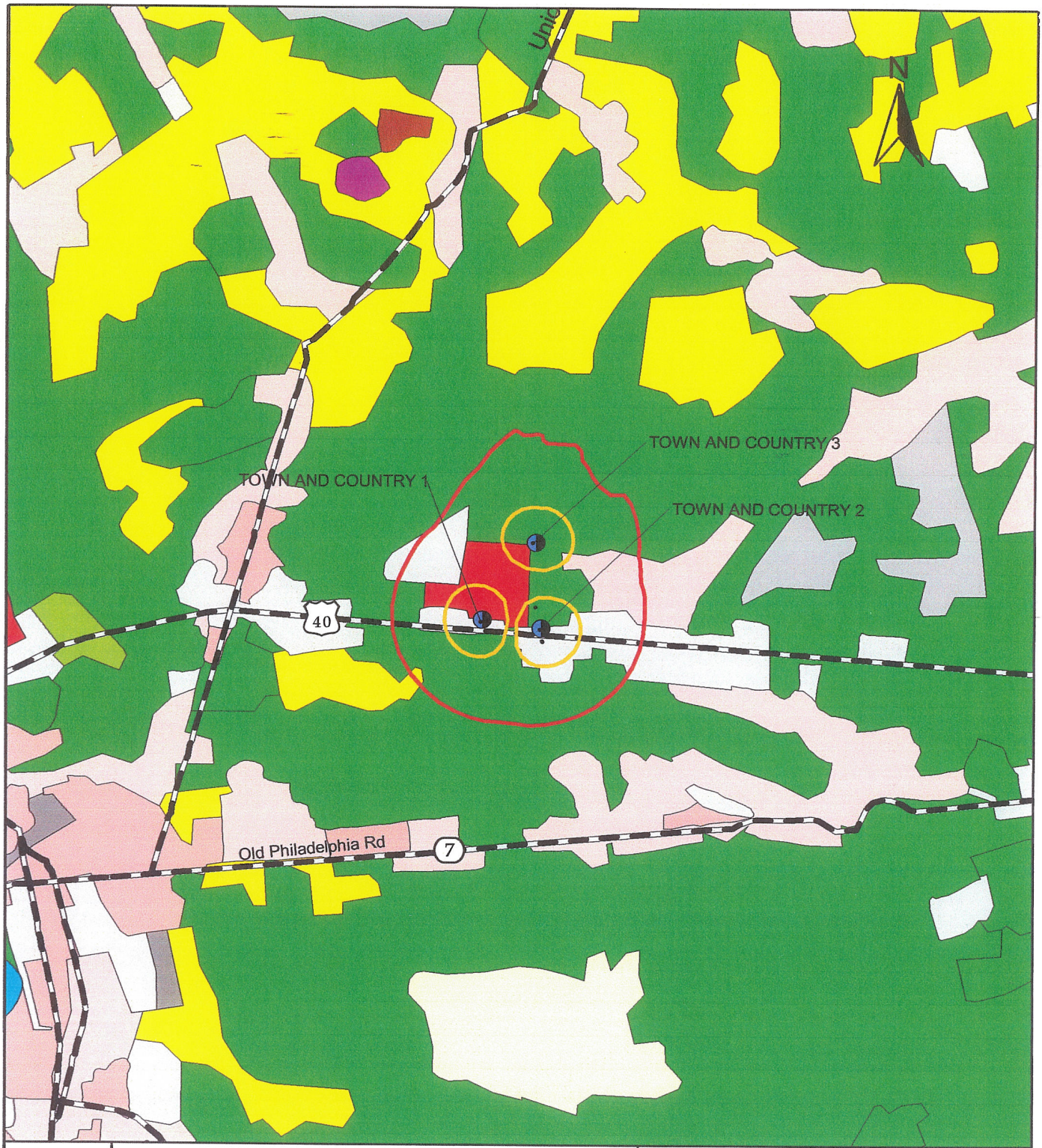

Figure 3. Town and Country MHP Land Use Map of the Source Water Protection Area

Source Water Assessment Program
2003

Scale: 1000 0 1000 2000 Feet

Source: Maryland Office of Planning, 2000.

Legend:

- MHP Wells
- SWPA Boundary, 1 yr Time of Travel
- SWPA Boundary, 10 yr Time of Travel
- Major Roads

Land Use

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Industrial
- Extractive
- Open Urban Land
- Cropland
- Pasture
- Forest
- Water
- Feeding Operations
- Barren Land

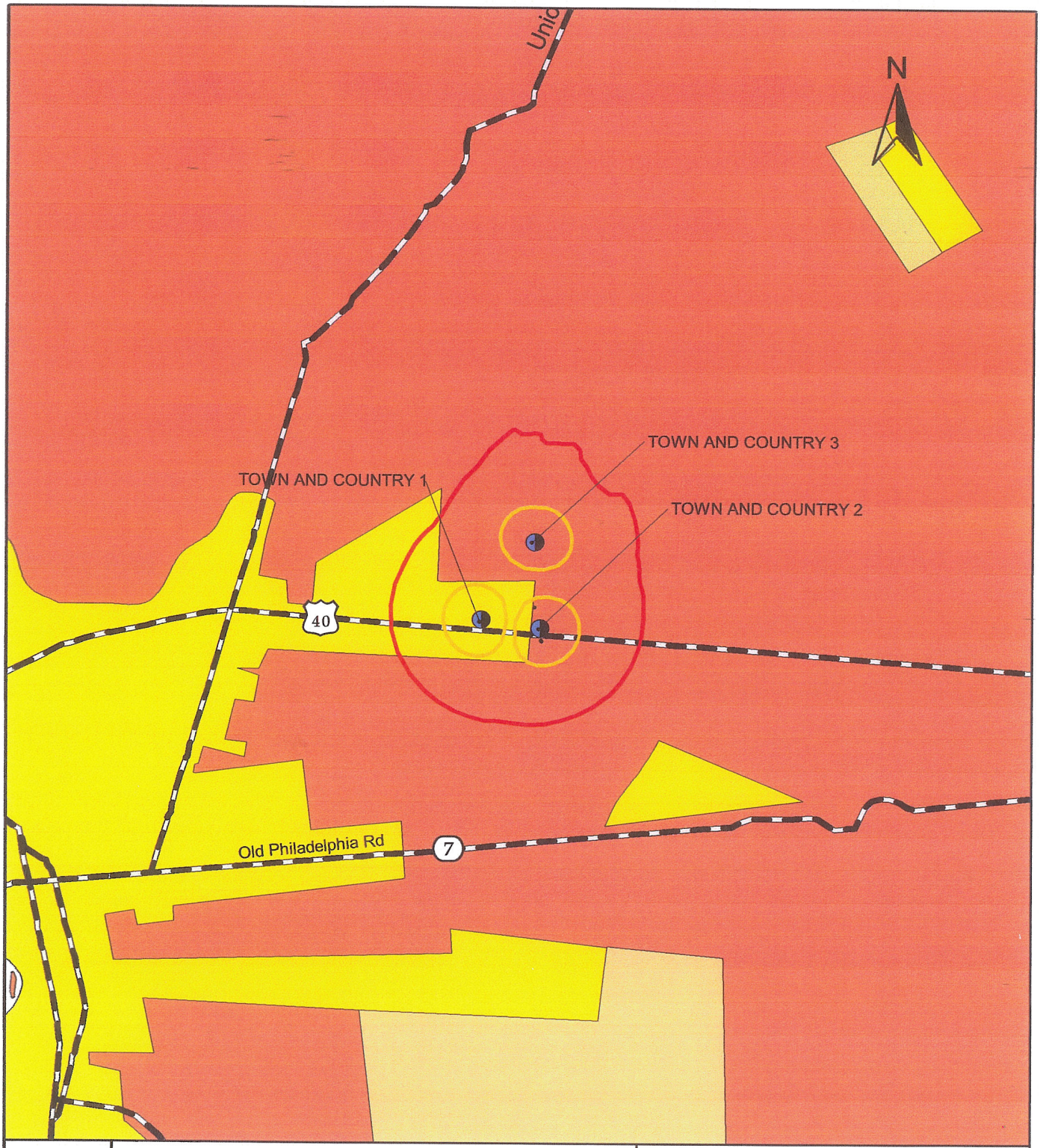

Figure 4. Town and Country MHP Sewer Service Map of the Source Water Protection Area

Source Water Assessment Program
2003

Legend:

- MHP Wells
- SWPA Boundary
- SWPA Boundary, 1 yr Time of Travel
- Major Roads

Sewer

- No planned service area
- Existing service area
- Area programmed for service within 5 years
- Area programmed for service within 5 ot 10 years

Source: Maryland Office of Planning, 1993.

Scale: 1000 0 1000 2000 Feet

4. REVIEW OF WATER QUALITY DATA

Water quality data was 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 1991 to 2002 has been performed for Town & Country MHP's finished water samples. All detected compounds from ground-water samples collected are shown in Appendix A.

Ground-water analytical results were compared to 50 percent of the United States Environmental Protection Agency (USEPA) Maximum Contaminant Levels (MCLs) or the USEPA Secondary Drinking Water Regulations (SDWR). If no MCL or SDWR is 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 above 50 percent of the USEPA MCL.

4.2 VOLATILE ORGANIC COMPOUNDS

No volatile organic compounds (VOCs) were reported in the ground-water samples above 50 percent of the USEPA MCL.

However, methyl-tert-butyl-ether (MTBE) was detected in the ground-water samples at concentrations ranging from 0.5 to 1.3 µg/L. MTBE is used as an additive to gasoline. The presence of MTBE in the ground-water aquifer is likely a result of a leaking gasoline underground storage tank. MTBE is presently on the USEPA Contaminant Candidate List (CCL) for evaluation of whether placement on the Primary Drinking Water Standards list is warranted. Due to its presence on the CCL, MTBE currently has no MCL; however, USEPA has an advisory level of 20 to 40 µg/L for the compound.

Low levels of ethylbenzene, toluene, and xylenes were reported in ground-water samples. Ethylbenzene, toluene, and xylenes were detected in the May 1996 ground-water sample at 1, 4, and 6 µg/L, respectively. These compounds are constituents in gasoline and may be present in ground water as a result of discharge from leaking underground storage tanks at gasoline stations or other facilities.

Additionally, low levels of 1,1,1-trichloroethene were reported in the ground-water sample collected in September 1994 at 0.8 µg/L. The current MCL for 1,1,1-trichloroethane is 20 µg/L.

4.3 SYNTHETIC ORGANIC COMPOUNDS

No synthetic organic compounds (SOCs) were reported in the ground-water samples above 50 percent of the USEPA MCL.

However, low levels of di(2-ethylhexyl) phthalate were reported in ground-water samples ranging from 0.6 to 1.6 µg/L. Di(2-ethylhexyl) phthalate is a common laboratory cross-contaminant and has a USEPA MCL of 6 µg/L.

p-Dichlorobenzene was detected in one ground-water sample in February 1997 at 0.6 µg/L. p-Dichlorobenzene is a chemical used in moth and insect control and has a USEPA Primary Drinking Water Standard MCL of 75 µg/L.

2,4-D was detected in one ground-water sample in January 2001 at 0.15 µg/L. 2,4-D is a chemical used as an herbicidal row crop treatment and has a USEPA Primary Drinking Water Standard MCL of 70 µg/L.

4.4 INORGANIC COMPOUNDS

No inorganic compounds (IOCs) were reported in the ground-water samples above 50 percent of the USEPA MCL.

However, low levels of nitrate were reported in ground-water samples, which ranged from 0.3 to 0.5 mg/L. Low levels of nitrite were also reported in ground-water samples, which ranged from 0.004 to 0.006 mg/L. Nitrate and nitrite are USEPA primary drinking water standard parameters with a USEPA MCL of 10 and 1 mg/L, respectively. Elevated levels may occur due to the influx of agricultural animal waste, agricultural chemicals or fertilizers, and/or septic system effluent into the drinking water.

Additionally, chromium, a USEPA primary drinking water standard parameter with an MCL of 0.1 mg/L, was detected in the September 1994 ground-water sample. Chromium present in drinking water may be a result of the erosion of natural deposits, erosion of chromium-containing painted surfaces, discharge from steel and pulp mills, or from wood treatment facilities.

4.5 MICROBIOLOGICAL CONTAMINANTS

No total or fecal coliform has been detected in ground-water samples of the water system's finished water from January 1997 to August 2002.

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 Supply Inspection Reports were reviewed.

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. Surface water that directly recharges the aquifer does not pass through the soil overburden that both filters and contains beneficial microorganisms that break down potential contaminants.

From an assessment of the GWUDI ground-water results from October and December 1998 by MDE, the ground-water supply for Town & Country MHP is not under the direct influence of surface water.

4.6 RADIONUCLIDES

Radionuclides are primary drinking water standard parameters. The MCL used for comparing detections of Radon-222 was 300 picocuries per liter (pCi/L). This MCL is a proposed MCL established by USEPA since there is no current MCL for this contaminant (EPA 1999). However, if a 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 utilized. Radon-222 was detected above the more conservative MCL as illustrated in Table 3 below.

TABLE 3. SUMMARY OF RADON-222 ANALYSIS

Plant ID	Sample Date	Contaminant Name	Result	Unit
01	11-Oct-00	Radon-222	**305**	pCi/L
02	11-Oct-00	Radon-222	**690**	pCi/L

ND = Not Detected.
Shaded values are greater than the more conservative MCL.

Additionally, gross alpha was detected below 50 percent of the MCL of 15 pCi/L in three sampling events at concentrations ranging from 1 to 3 pCi/L, respectively.

5. SUSCEPTIBILITY ANALYSIS

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

1. available water quality data
2. presence of potential contaminant sources in the SWPA
3. aquifer characteristics
4. well integrity
5. the likelihood of change to the natural conditions

The aquifer that supplies Town & Country MHP's 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 COMPOUNDS

No VOC concentrations were reported above 50 percent of the MCL in any of the water samples analyzed.

Low-levels of the gasoline constituents and MTBE, a gasoline additive for cleaner air emissions, were reported in the water samples analyzed. The industrial solvent 1,1,1-trichloroethene was reported in the September 1994 water sample with a concentration of 0.8 µg/L. Two point sources were observed within the SWPA including Cecil County Auto Body, E Sprague Champion Service Auto Repair, and B&H New and Used Auto Parts. Gasoline spills and/or releases of solvents at the facilities could allow for the transport of these contaminants into the ground water. However, non-point sources such as roadway spills of gasoline along Route 40 are possible and may have affected the ground-water quality.

Based on the recent water quality data reviewed and the presence of facilities within the SWPA that may cause VOC contamination in the SWPA, the water supply at Town and County MHP is moderately susceptible to VOCs.

5.2 SYNTHETIC ORGANIC COMPOUNDS

No SOCs were reported in the ground-water samples above 50 percent of the MCL.

Low levels of di(2-ethylhexyl)phthalate were reported well below the MCL in water samples analyzed and are most likely the result of laboratory cross-contamination.

The possible use of fertilizers, herbicides, and pesticides on lawns of residential areas within the SWPA can be considered a potential non-point source of SOCs. An insecticide (p-dichlorobenzene) and a herbicide (2,4-D) were reported in low concentrations in two water samples analyzed. 2,4-D was reported in the January 2001 water sample.

While PCB transformers were observed onsite, PCB has a high affinity to sorb to soil particles and a low solubility in water and is not likely to affect ground-water quality.

Based on the water quality data reviewed and the potential point sources and non-point sources of SOCs, the water supply at Town & Country MHP is moderately susceptible to SOCs.

5.3 INORGANIC COMPOUNDS

No IOC concentrations were reported above 50 percent of the MCL in any of the water samples analyzed.

Seventy-eight percent of the SWPA is not served by public sanitary sewer systems and most likely uses septic systems, which can cause nitrate pollution in ground water. However, no concentrations of nitrate have been reported above 1 mg/L. No trends in the reported nitrate concentrations in the water samples have been observed over time.

Based on the water quality data reviewed and the lack of point sources of IOCs, the water supply at Town & Country MHP has a low susceptibility to IOCs.

5.4 RADIONUCLIDES

Radon-222 was reported above the more conservative proposed MCL of 300 pCi/L in the two water samples collected in October 2000.

While the presence of radon-222 is generally attributed to decay of naturally occurring minerals like uranium in the aquifer sediments (Bolton 1996), the concentration of radon-222 is higher than the more conservative proposed MCL. However, this proposed rule is not enforceable and

MDE is waiting for the USEPA's final rule to determine how radon will be regulated for public water systems (USEPA 1999).

Based on the water quality review and the characteristics of the aquifer, the water supply at Town & County MHP is moderately susceptible to radon-222 and has a low susceptibility to other radionuclides.

5.5 MICROBIOLOGICAL CONTAMINANTS

No coliform bacterium has been detected in the water samples since 1997. From an assessment of GWUDI ground-water results by MDE, the ground-water supply for Town & Country MHP is not under the direct influence of surface water. From documentation reviewed, at least one of the three supply wells was constructed after 1973, the year that current well construction standards were required. Two of the three wells were observed to be in good repair.

Based on the water quality review, the water supply at Town & Country MHP has a low susceptibility to microbiological contaminants.

6. RECOMMENDATIONS FOR PROTECTING THE WATER SUPPLY

With the information contained in this report, Town & Country MHP has a basis for better understanding of the risks to its drinking water supply. Being aware of the source water protection area, 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 mobile home park owner and its residents. Specific management recommendations for consideration are listed below.

6.1 PROTECTION TEAM

The management of the mobile home park should be aware of the Source Water Protection Area limits and evaluate the possible effects to the quality of the ground water prior to building or making any changes.

The management of the mobile home park should also contact the owner of the electricity transformers observed onsite to assess whether they contain PCB oil.

6.2 PUBLIC AWARENESS AND OUTREACH

The management of the mobile home park should consider discussing with property owners and businesses located within the SWPA activities that may have impacts to the ground water and its quality.

The management of the mobile home park 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 mobile home park 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 MHP owner, the local library, or MDE.

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 Cecil County Land Use Map
Maryland Office of Planning 1993 Cecil County Land Use Map
USGS Topographic 7.5 minute Quadrangle Map – 1992 North East, Maryland Quad
USGS Topographic 7.5 minute Quadrangle Map – 1992 Bay View, Maryland Quad

Appendix A

Detected Compounds in Ground-Water Samples

SUMMARY OF DETECTED COMPOUNDS IN TOWN & COUNTRY MOBILE HOME PARK WATER SAMPLES				
Plant ID	**Sample Date**	**Contaminant Name**	**Result**	**Unit**
Volatile Organic Compounds				
02	21-May-96	ETHYLBENZENE	1	ug/L
02	21-May-96	METHYL-TERT-BUTYL-ETHER	4	ug/L
01	13-Aug-98	METHYL-TERT-BUTYL-ETHER	1.3	ug/L
01	18-Jan-00	METHYL-TERT-BUTYL-ETHER	1.2	ug/L
02	18-Jan-00	METHYL-TERT-BUTYL-ETHER	0.5	ug/L
03	18-Jan-00	METHYL-TERT-BUTYL-ETHER	1.1	ug/L
01	22-Jan-01	METHYL-TERT-BUTYL-ETHER	0.9	ug/L
02	22-Jan-01	METHYL-TERT-BUTYL-ETHER	0.6	ug/L
03	22-Jan-01	METHYL-TERT-BUTYL-ETHER	0.6	ug/L
01	12-Jun-02	METHYL-TERT-BUTYL-ETHER	0.7	ug/L
02	12-Jun-02	METHYL-TERT-BUTYL-ETHER	1.3	ug/L
03	12-Jun-02	METHYL-TERT-BUTYL-ETHER	0.7	ug/L
01	13-Feb-97	p-DICHLOROBENZENE	0.6	ug/L
02	21-May-96	TOLUENE	4	ug/L
01	21-Sep-94	TRICHLOROETHYLENE	0.8	ug/L
02	21-May-96	XYLENES, TOTAL	6	ug/L
Synthetic Organic Compounds				
01	22-Jan-01	2,4-D	0.15	ug/L
01	21-Sep-94	DECACHLOROBIPHENYL	0.1	ug/L
01	08-Oct-96	DI(2-ETHYLHEXYL) PHTHALATE	0.614	ug/L
03	08-Oct-96	DI(2-ETHYLHEXYL) PHTHALATE	0.614	ug/L
01	13-Aug-98	DI(2-ETHYLHEXYL) PHTHALATE	1.4	ug/L
03	18-Jan-00	DI(2-ETHYLHEXYL) PHTHALATE	0.6	ug/L
02	11-Oct-00	DI(2-ETHYLHEXYL) PHTHALATE	0.8	ug/L
01	22-Jan-01	DI(2-ETHYLHEXYL) PHTHALATE	1.6	ug/L
Inorganic Compounds				
01	21-Sep-94	CHROMIUM	0.006	mg/L
01	21-Sep-94	NICKEL	0.004	mg/L
01	21-Sep-94	NITRATE	0.39	mg/L
01	08-Oct-96	NITRATE	0.5	mg/L
03	08-Oct-96	NITRATE	0.4	mg/L
02	15-Oct-96	NITRATE	0.5	mg/L
01	18-Jan-00	NITRATE	0.4	mg/L
02	18-Jan-00	NITRATE	0.4	mg/L
03	18-Jan-00	NITRATE	0.3	mg/L
01	08-Oct-96	NITRITE	0.004	mg/L
03	08-Oct-96	NITRITE	0.004	mg/L
02	15-Oct-96	NITRITE	0.006	mg/L
01	08-Oct-96	SODIUM	51.6	mg/L
03	08-Oct-96	SODIUM	58.8	mg/L
02	15-Oct-96	SODIUM	52.8	mg/L
01	18-Jan-00	SODIUM	34.1	mg/L
02	18-Jan-00	SODIUM	64.3	mg/L
03	18-Jan-00	SODIUM	34.2	mg/L

SUMMARY OF DETECTED COMPOUNDS IN TOWN & COUNTRY MOBILE HOME PARK WATER SAMPLES, con't				
General Water Quality Parameters				
01	08-Oct-96	pH	6.5	s.u.
03	08-Oct-96	pH	7	s.u.
02	15-Oct-96	pH	6.5	s.u.
Radionuclides				
00	28-Oct-92	GROSS ALPHA	2	pCi/L
00	14-Jan-97	GROSS ALPHA	2	pCi/L
02	22-Jan-01	GROSS ALPHA	1	pCi/L
01	22-Jan-01	GROSS ALPHA	3	pCi/L
03	22-Jan-01	GROSS ALPHA	2	pCi/L
02	11-Oct-00	RADON-222	690	pCi/L
01	11-Oct-00	RADON-222	305	pCi/L

s.u. – standard units.