SOURCE WATER ASSESSMENT
FOR GROUNDWATER SUPPLIES
SERVING TRANSIENT NON-COMMUNITY SYSTEMS
IN EASTERN FREDERICK COUNTY, MARYLAND

ALWI Project No. FR7S575

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Prepared for

THE MARYLAND DEPARTMENT OF THE ENVIRONMENT

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EXECUTIVE SUMMARY

Advanced Land and Water, Inc. (ALWI) was retained by the Maryland Department of the Environment (MDE) to prepare a source water assessment (SWA) for 72 groundwater wells serving 49 Transient Non-Community (TNC) public supplies located in eastern Frederick County, Maryland. This SWA was prepared in accordance with the 1999 MDE Source Water Assessment Plan (SWAP).

Herein, ALWI delineates SWA areas that follow the 1999 MDE SWAP. Within SWA areas, we identify and map existing and potential contaminant hazards, assess the susceptibility of the subject wells to contamination, and formulate specific strategies to reduce the future risk of contamination.

ALWI found that many of the wells are susceptible to bacteriologic contaminants, and by extension, possibly viral and protozoan contaminants as well. Many wells also are susceptible to nitrate-nitrogen contaminants. Other conditions of susceptibility may also be present; with few exceptions, only bacteriologic and nitrate sampling results were available for review because of limits on TNC water quality monitoring requirements.

We identified several instances of seemingly incompatible land uses proximal to one or more of the wells, where changed or relocated operations could mitigate the future risk of contamination. To the degree that they seem practical to implement, appropriate suggestions have been offered on a hazard-specific basis. Generally, our recommendations for improved wellhead protection include hazard reduction measures, wellhead integrity maintenance, contingency planning, customized water quality sampling protocols, contaminant release response protocols and public awareness in the form of focused outreach to the well owners.

1.0 INTRODUCTION

Advanced Land and Water, Inc. (ALWI) was retained by the Maryland Department of the Environment (MDE) to prepare source water assessments (SWAs) of Transient Non-Community (TNC) groundwater supplies located in Frederick and Howard Counties, Maryland. The work was funded and prepared for the Water Supply Program of MDE.

ALWI Proposal Nos. FR7S575 and HO7S475 were authorized by MDE on February 12, 2004. This source water assessment and wellhead protection plan then was developed pursuant to our contract with MDE, with references to the 1999 MDE Source Water Assessment Plan (SWAP).

1.1 REGULATORY FRAMEWORK

The Safe Drinking Water Act (SDWA) of 1974 required the U.S. Environmental Protection Agency (EPA) to develop enforceable drinking water quality standards to protect public health. In 1986, amendments made to the SDWA strengthened provisions for the protection of underground sources of drinking water. These amendments included provisions for establishing Wellhead Protection Programs by individual states under "umbrella" EPA oversight.

The EPA approved MDE's Wellhead Protection Program in June 1991. The 1996 Amendments to the SDWA required Maryland (and other states) to develop SWAs. On an individual system basis, the SDWA provides guidance for an approvable system-specific SWA. Wellhead protection programs and system-specific SWAs, therefore, are related in design and purpose.

As aforementioned, ALWI's work was designed and executed following the 1999 MDE SWAP. Authorized tasks included SWA area delineations, contaminant hazard identification, susceptibility analyses, and recommendations regarding the implementation and management of the SWA areas.

1.2 BACKGROUND INFORMATION

Before or shortly after the outset of our work, MDE provided baseline information from which ALWI gleaned the following background information to aid the development of this plan:

1. **Number and Type of Systems** - ALWI's overall SWAP work covered 157 TNC groundwater supply systems in Frederick County, and 56 TNC groundwater supply systems in Howard County. Community systems, non-transient systems and unclassified systems that serve very small populations were excluded from consideration herein.

2. **Number of Sources Per System** - Most systems subject to this SWA withdraw groundwater from a single on-site well. Some of the systems use more than one well, manifolded together. The source water assessments for TNC surface water intakes, if any exist were excluded from our contract.

3. **Regional Distribution of SWA Data** - Because a singular report covering all subject systems would be voluminous and unwieldy, ALWI judged it beneficial to subdivide the system list geographically and geologically. This approach resulted in a relatively even

distribution of systems across three regions in Frederick County and two in Howard County. The focus of this report is the eastern Frederick region (Figure 1), which geologically is dominated by metamorphic rocks (see Section 2.2). In total, there exist 72 wells serving 49 individual systems in this region (Table 1).

4. **Groundwater Withdrawal Rates** - The subject systems withdraw varying quantities of water. The approximate amount of water being used is known for systems permitted through the MDE Water Appropriation Program. MDE estimates groundwater withdrawal amounts, based on applicant and permittee interviews and submitted site plan data. Systems without permits generally are un-metered and water use is not known. MDE knew that getting accurate pumping information from these types of systems would be nearly impossible. A generic SWA area was developed by MDE to be used for all transient water systems pumping less than 10,000 gallons per day (gpd) from fractured rock aquifers. The delineation methodology is specified in the 1999 MDE SWAP. The generic SWA area directs a circle centered on the well with a 1,000 foot radius (see section 3.0). The generic SWA area errs on the side of conservatism to help ensure that the SWA area is large enough for all small systems where the groundwater withdrawal is unknown.

2.0 HYDROGEOLOGIC FRAMEWORK

A scientifically sound and well-reasoned SWA area delineation is key to effective wellhead protection. For this reason, ALWI began its technical work by evaluating the hydrogeologic framework underlying the groundwater recharge areas contributing to the subject production wells. We used published information from the United States Geological Survey (USGS) and the Maryland Geological Survey to identify and describe the characteristics of the local hydrogeologic setting. We also obtained records from MDE and the Frederick County Health Department (FCHD) to help confirm specific information regarding the wells that are the subject of this SWA.

2.1 SITE TOPOGRAPHY

According to the USGS 7.5-minute series topographic quadrangle maps for eastern Frederick County, regional elevations generally range from 300 to 1300 feet above mean sea level, with the topographic high being Sugarloaf Mountain. Otherwise in the study area, the land surface is typified by flat to gently sloping terrain. Regionally, most broad hills and subtle valleys appear to trend northeast/southwest, parallel to geologic strike.

2.2 GEOLOGY/HYDROGEOLOGY

Eastern Frederick County is underlain by Late Proterozoic and Lower Cambrian metasedimentary and metavolcanic rocks of the western Piedmont (Southworth, 1999). The west side of the region is bordered by the rocks of the Araby Formation, which forms the Frederick Valley synclinorium along the Martic thrust fault (Knopf and Jonas, 1929; Cloos and Hietanen, 1941; Eisner, 1986). The Westminster Terrane, which contains the Sugarloaf Mountain anticlinorium, is thrust onto the Frederick Valley synclinorium along the Martic thrust fault (Southworth, 1999). The Sugarloaf Mountain Quartzite and Urbana Formation constitute the Sugarloaf Mountain anticlinorium. The Westminster Terrane is comprised of the remaining

formations listed below. The major geologic formations within eastern Frederick County, from youngest to oldest, are described as follows:

- Urbana Formation - The Cambrian aged Urbana Formation contains a wide variety of metasedimentary rocks, including metasiltstone and metagraywacke, calcareous sandstone and quartzite and marble (Southworth, 1999). The calcareous sandstone is medium-to-coarse grained quartz sand with calcite seams, and the quartzite consists of medium-to- coarse grained quartz and quartz lithic clasts. These two rock units, along with the marble unit, are found in low abundance in this region.

- Sugarloaf Mountain Quartzite - This Cambrian aged formation is characterized by medium bedded to massive, medium-to-coarse grained white quartzite (Southworth, 1999). Interbedded with the quartzite is a dark-blue to black, laminated siltstone and phyllite, which is lithologically similar to the Urbana Formation.

- Libertytown Metarhyolite - The Libertytown Metarhyolite is a purple, bluish-black and red, fine-grained metarhyolite. It contains feldspar phenocrysts, and is commonly interbedded with blue/purple metaandesites and green phyllitic slates (Cleaves et. al, 1968).

- Sams Creek Metabasalt - The metavolcanic rocks of the Sams Creek Formation varies depending on location. In general, this formation is a dark-greenish-gray to medium-bluish-gray, aphanitic to porphyritic, massive to schistose greenstone (Southworth, 1999). Other rocks units within the Sams Creek Formation are metavolcanic and metavolcaniclastic schist, muscovite-chlorite phyllite, quartzite, and other minor rock units.

- Ijamsville Formation - Rocks mapped in the Ijamsville Formation, in decreasing abundance, are phyllite, phyllonite, slate, greenstone, quartzite, limestone and calcareous quartzite (Southworth, 1999). The phyllites and phyllonites range in color from blue, bluish-gray, red-purple, greenish-gray to pale-olive and consist predominantly of muscovite and chlorite. The greenstones can be dark-greenish-gray to yellow-green in color and be aphanitic to porphyritic.

- Marburg Schist - The Marburg Formation of Edwards (1994) is a metamorphosed marine shale and siltstone of probable Cambro-Ordovician age. Usually the Marburg Formation appears as a silvery gray to tan waxy phyllite that weathers to gray or tan chips. In certain localities, it can contain light gray, tan, to dark brown-to-gray quartzite beds and/or dark-gray calcareous phyllite. Unpublished work now underway for another ALWI client northeast of Libertytown suggests that the quartzite and calcareous members are locally important water producers.

Additionally, eastern Frederick County is crossed by several north-to-south trending Triassic-aged diabase dikes. These dikes may form a partial barrier to local groundwater flow.

2.3 AQUIFER RECHARGE

Precipitation infiltrating through the soil, particularly near and up-gradient of the subject wells, is the primary source of aquifer recharge. Generally, overlying soil horizons act to absorb and then

slowly release infiltrating precipitation. A portion of the precipitation percolates downward through the soil mantle and then may migrate through narrow, interconnected joints, fractures, faults and cleavage planes in the bedrock.

2.4 WATER QUALITY AND CONTAMINATION RISK

Groundwater within eastern Frederick County generally is considered suitable for consumption. Nitrate concentrations tend to be elevated as a consequence of historic agricultural activities atop underlying geology regimes subject to this assessment, but generally remain below the drinking water standard. Regionally, the groundwater generally has favorable secondary (aesthetic) characteristics. A discussion of the quantitative susceptibility of the groundwater to contamination, as indicated from the available water quality records, is provided in Chapter 5 herein.

Certain wells in eastern Frederick County could be particularly vulnerable to contamination hazards in areas where major fracture zones occur. A majority of the wells in eastern Frederick County are completed within metasedimentary or metavolcanic rocks which can contain bedrock fracture zones (where present) that can function as both downward and lateral water conduits. As a result, fracture zones receive and transmit water at a rate higher than would otherwise be available in unfractured areas. Recharge features and wide flow paths may limit natural filtration processes.

3.0 SWA AREA DELINEATIONS

In accordance with the 1999 MDE SWAP, ALWI delineated the areas surrounding the subject wells using the fixed radius method. The 1999 MDE SWAP specifies a 1,000 foot radius, based on an assumed drought-year recharge rate of 400 gpd per acre and an assumed withdrawal rate as high as 10,000 gpd. As discussed in Section 1.2, for most of the systems the withdrawal rate is far less than 10,000 gpd. This creates an adequate safety factor. The resultant delineations are summarized in detailed maps presented in Appendix A.

4.0 CONTAMINANT THREATS ASSESSMENT

ALWI identified existing and potential contaminant sources within each SWA area. The techniques used for identifying a hazard included spatially indexed database reports, regulatory inquiries, field observations and personal interviews. The SWAP suggests that the following potential contamination point sources be inventoried and mapped, for groundwater sources:

- Sites/facilities that hold groundwater discharge permits;
- Land disposal sites, such as landfills, certain less formal refuse disposal areas, and trenched sludge disposal sites;
- Underground storage tanks (USTs), including release sites and fuel lines;
- Coal mining areas (none exist in eastern Frederick County); and

- Areas prone to salt water intrusion (none exist in eastern Frederick County).

Herein, we collectively term these "SWAP-classifiable point-source hazards." Other possible point-sources of groundwater contamination also may exist. Only those deemed SWAP-classifiable required specific identification and mapping for compliance with the 1999 MDE SWAP. ALWI identified potential contamination hazards in stepwise fashion in the order of the report subsections within this Chapter.

4.1 Regulatory Database Reviews

ALWI began the process of identifying potential point-source contamination hazards by acquiring a spatially indexed list of SWAP-classifiable point source hazards from MDE. Among other regulatory information[1], the MDE listing provides spatially indexed information on regulated landfills, UST and leaking UST facilities, groundwater discharge permittees, petroleum release sites, trenched sludge disposal sites, pesticide dealers and regulated dumpsites.

4.2 Field Reconnaissance

Guided by the MDE databases, ALWI performed a visual reconnaissance of publicly accessible portions of each wellhead and surrounding SWA area to observe wellhead conditions, facilities or land use practices potentially constituting a SWAP-classifiable point-source contamination hazard. Pertinent information regarding existing and potential SWAP-classifiable point source contamination hazards (mapped within Appendix A) were noted (Table 2).

Wellhead locations and on-site, point-source contamination hazards were mapped using differentially-correcting GPS, capable of acquiring data with sub-meter precision (see Section 4.3). Off-site contamination hazard locations were mapped from the subject parcel(s) and public rights-of-way, resulting in mapping locations with a level of precision meeting or exceeding contract requirements[2], but without engendering trespass concerns.

ALWI observed each wellhead to the degree exposed and observable without excavation, confined-space entry, or other exposure to unusual personal hazards. Most of the subject wells appeared to possess good physical integrity at the wellheads (exceptions noted in Table 2), though no subsurface or invasive work of a confirmatory nature was performed. In nearly all cases, no visual evidence of existing, direct contamination to the wells was observed.

Subject wellheads generally were observed in outdoor locations, with casing stickup and pitless connections. Observations of potential concern at the wellheads and/or within the delineated SWA areas are summarized in Table 2; photographs are contained within Appendix B[3] (see

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[1] MDE also provided other information (e.g., facilities where hazardous waste is generated and/or stored), not specifically germane to this SWA as set forth in the SWAP.

[2] ALWI used a handheld GPS unit, capable of acquiring data at a precision level of 3-15 meters, which satisfied contract specifications. Differential correction would have provided a false aura of accuracy, given that the GPS unit was operated at locations remote from the identified, private-property hazards.

[3] In a few circumstances, field conditions rendered photography infeasible (e.g., PWSID Nos. 1101001, 1101207, and 1101233(2)).

enclosed disc).

4.3 Summary Classifications of Wellhead Hazards Observed

Design, construction and present condition are important factors in determining the contamination susceptibility of a well. Certain observations, warranting consideration, concern, and/or improved practices, were as follows:

1. **Wellheads in Frost Pits, Vaults and Other Manmade Enclosures** - In certain circumstances (e.g., PWSID Nos. 1101086, 1101120 (02), 1101207, 1101210, 1101233 (02) and 1101248 (01)), ALWI was unable to observe these wells because each were concealed in some fashion (e.g., vaults, locked bunkers, concrete enclosures, buried underground, etc). For these certain systems we presumed that the top of the casing terminates in a non-watertight subsurface vault, in apparent violation of several provisions[4] within COMAR 26.04.04.07F. If such a well were bacteriologically contaminated (Nos. 1101207 and 1101210 appear so, see Chapter 5.0), the bacteria and potentially associated pathogenic organisms could enter the well through open ports in its sanitary seal.

2. **No Well Tag** - Design, construction and present condition are important factors in determining a well's susceptibility to contamination. However, no well tag was visible for many of the subject wells. For those, ALWI could not assess the initial design or present condition of the casing or grout seal. Another issue associated with missing well tags was being able to differentiate between untagged wells listed in the MDE database (See Section 4.6).

3. **Missing, Loose or Ajar Caps** - In one instance (PWSID No.1101270 (02)), a well was equipped with a conventional pitless-style cap of the type that was broken, which could allow insects or other hazards to enter the well. Replacing the broken well cap with a more modern cap would provide greater protection against microbial contamination.

4. **Indoor Wellheads** - In a few instances (PWSID Nos. 1101210 and 1101325), the well was contained in a building. There was no observed hatch in the above ceiling or the roof that would allow easy access should the pump need to be serviced.

4.4 Summary Classifications of Point Source Hazards Observed

In addition to the wellhead reconnaissance and hazard identification, ALWI also performed a field reconnaissance from public rights-of-way within the SWAs. Readily-observable point-source contamination hazards, of a SWAP-classifiable nature, included the following:

1. **Underground Storage Tanks** - Several subject TNC systems had facilities with USTs within the corresponding SWA (see Table 2). Surficial and subsurface fuel spills from such USTs are possible, even if the facilities are within regulatory compliance standards. Based on

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[4] This regulation prohibits frost pits, requires pitless adapters, and specifies that the finished height of well casings extend at least eight inches above natural grade.

comparable experience, ALWI has observed that UST sites may achieve compliance and pass leakage detection tests even with low to moderate degrees of subsurface petroleum contamination. Given the proximity of the UST field to the well, analytical testing to confirm the absence of gasoline and diesel fuel constituents (e.g., benzene, toluene, ethylbenzene, xylene, methyl-tertiary-butyl ether [MTBE], naphthalene), and totals for both gasoline- and diesel-range petroleum hydrocarbon compounds seems appropriate[5].

2. **Groundwater Discharge Facilities** - MDE generally regulates large groundwater discharges, exceeding 5,000 gpd. When near subject wells (e.g., PWSID No. 1101150), these have been mapped. Smaller wastewater discharges are ubiquitous, though not specifically mapped based on the 1999 MDE SWAP. Older septic tanks, if present, may have seams. Generally we believe that when a septic system needs replacement or is newly installed within a SWA area, the tank should be a seamless model.

3. **Highway and Parking Area Deicing** - Highway and parking area deicing practices may increase a seasonal risk of sodium and chloride contamination. The State Highway Administration is unlikely to curtail or otherwise change deicing practices on nearby state and federal highways. However, consideration should be given to using non-chemical abrasives on the private parking lots for deicing to the degree possible.

Table 2 contains identified SWAP-classifiable hazards, sorted by the TNC system potentially affected. In many cases, the existence of a potential contamination hazard (i.e., its listing on a regulated facilities database) is an incidence of environmental compliance and does not itself indicate or imply an existing contaminant release.

4.5 Non-Point Source Contamination Hazards as Suggested by Land Use

The 1999 MDE SWAP suggests consideration and mapping of the following classifications of land use within the SWA areas: low, medium and high density residential, institutional, open urban land, industrial, commercial, crop land, pasture, deciduous forest, evergreen forest, mixed forest, brush, water, and agricultural building. Additionally, the 1999 MDE SWAP recommends that the extent of community sewer service areas be mapped, if within SWA areas.

ALWI obtained countywide land use and community sewer Geographic Information Systems data and maps from MDE and the Maryland State Office of Planning. Pertinent land use acreages and percentages, within the SWA areas, are listed in Figure 2. Dominant land uses within the SWA areas are agricultural lands, forests, commercial and existing residential areas (Figure 2).

Figures A-1 through A-12 (Appendix A) also depict the approximate extent of public sewer service within and near affected SWA areas. In total, approximately 8% of the area within all SWA areas in eastern Frederick County existed in public sewer service areas. Property owners may discharge inappropriate liquid wastes, down the drain or onto the ground. In the former case

[5] Any finding of petroleum-contaminated groundwater must be reported to the MDE Oil Control Program. Such a report would open (or reopen) an Oil Control Program case file. MDE Oil Control Program representatives may order additional sampling, UST tightness testing, UST removal(s), monitoring well drilling, and/or other investigative and remedial measures. ALWI suggests that site ownership and FCHD interests consult legal counsel before taking any action that could have adverse financial or environmental liability consequences.

and absent a public sewer system, the drain connects to a septic system and thus, to the local groundwater aquifer.

4.6 Resolution of Conflicting Data

In certain instances, the information that we received from various sources (i.e., the MDE databases, field observations, system owner interviews, etc.) appeared in internal conflict. For example, the MDE databases may indicate that two wells were on a single system, but during our reconnaissance the system owner verified that there was only one well serving the system. Some systems had additional wells that were not recorded in the MDE database, or the wells located by ALWI are replacement wells. Although these circumstances were few, they posed special challenges when they arose.

To help resolve these issues, ALWI contacted the FCHD for clarifications. FCHD sanitary surveys were reviewed for those systems where information otherwise appeared internally contradictory (Appendix C). Using the sanitary surveys and presuming them to be definitive, most ambiguities and inconsistencies were resolved.

Within eastern Frederick County, only two systems remain inconsistent with the MDE database (PWSID Nos. 1101305 and 1101146). For PWSID No. 1101305, a total of four wells were identified, one with a tag number and three without tags. Two wells, one with a tag number and one without a tag number, are listed on available documents; an additional two untagged wells were also observed in the field. It was not possible to discern which of the three untagged wells correlates with the documentary information provided by MDE.

The MDE database indicates that three wells serve PWSID No. 1101146. One of the three wells has been abandoned, but due to the absence of tag numbers on all three wells, it cannot be determined which well was abandoned (in terms of which one is in the MDE database), and which two wells currently serve the system.

There were numerous instances where wells, not presently recorded in the MDE database, were located in the field by ALWI (PWSID Nos. 1101002 (2), 1101163 (03), 1101229 (03), 1101248 (02), 1101270 (2), 1101305 (03) and 1101305 (04)).

Replacement wells observed by ALWI were associated with PWSID Nos. 1101314 (2), 1101066 (02) and 1101124 (02).

5.0 QUANTITATIVE ASSESSMENT OF CONTAMINANT SUSCEPTIBILITY

Building Consultants Incorporated (BCI), a woman-owned subconsultant working under ALWI's direct and continuous supervision, completed a review of available groundwater quality records to support an assessment of groundwater susceptibility as described in the 1999 MDE SWAP.

5.1 Procedures

The susceptibility assessment depended on electronic databases furnished by MDE (summarized in Appendix D), other water quality records furnished by MDE and reviewed in MDE files

(Appendix E), our past overall experience in projects of this nature and in working as a hydrogeological consultant for public and private concerns within the subject area, and the results of the field reconnaissance described in Section 4.2 herein. Generally, the susceptibility assessment was completed in accordance with the following step-wise procedure:

1. **Obtain and Filter Electronic Records** - We reviewed available electronic databases of water quality analyses provided by MDE and extracted pertinent data (Appendix D). The raw databases first were filtered to isolate only TNCs subject of the presently authorized study and within the geographical range of this specific report (i.e., eastern Frederick County).

2. **Consider Chemical Classes** - Because the subject systems are small TNCs, the furnished databases contained analytical records for bacteriologic and nitrate sampling results. No information was available for other classes of contaminants.

3. **Identify "Exceedance" Instances** - We defined an "exceedance" as a singular test result indicating Maximum Contaminant Level (MCL). To identify such exceedances, we compared each specific analytical water quality result to published MCLs (in COMAR 26.04.01 as of the date of authorization of this work). Guided by MDE, we judged that a concentration of precisely 50% of a given MCL (i.e., 5 mg/L for nitrate) should be considered an exceedance. Procedurally, this was accomplished by sorting the database on a system-by-system basis by analyte and concentration.

4. **Assess Frequency and Relative Percentage of Exceedance Instances** - The number of times that a given analyte was detected in a concentration greater than 50% of its respective MCL was discerned in terms of overall frequency, percentage of total number of samples and date range of exceedance. Then, for conformance with the MDE SWAP, only those contaminants with 50% of the MCL equaled or exceeded were further evaluated. Certain results that seemed anomalous or otherwise surprising were flagged for a confirmatory file review.

5. **Data Quality Assurance Through File Review at MDE** - On December 13 and 14, 2004, BCI reviewed select hard copy water quality data at MDE offices in Baltimore, Maryland to assure that our findings accurately reflected the whole of the water quality records available at that time. These manually-collated data sources (Appendix E) allowed us to verify the accuracy of the databases MDE had previously furnished[6].

6. **Integration** - ALWI then identified correlations between water quality exceedances and specific field observations suggestive of a condition of susceptibility.

5.2 RESULTS

The available data support an interpretation that many of the subject TNC wells are susceptible, in whole or in part to several compounds, summarized in Tables 3 and 4 and discussed below.

[6] Records predating 1998 were not observable during the time of the review and consequently, the accuracy of said records cannot be guaranteed. According to MDE, the records have been archived and are available for review for any data that may be questionable or inconsistent.

1. **Nitrate** - Many of the wells subject to this assessment were found to be susceptible to nitrate contamination. The wells generally record concentrations approaching the established MCL of 10 mg/L; amounts exceeding the susceptibility threshold of 5 mg/L were more common than not.

2. **Bacteria** - Total coliform bacteria may not themselves be pathogenic, but often are an indicator or screening tool for identifying possible bacteriologic, protozoan and viral contamination. As indicated in Table 3, the raw water within many of the subject wells appears susceptible to bacteria, protozoa and viruses. In some circumstances, the whole of the data suggest groundwater under the direct influence (GWUDI) of surface water because of rainfall-correlative bacteria. However, because many of the wells that appear possibly GWUDI actually began with bacteria even in dry conditions and other uncertainties in the time trends of the data, it cannot be determined from the available data whether the wells are GWUDI or whether they merely lack appropriate disinfection. MDE plans additional sampling to support a more conclusive determination of GWUDI.

5.3 LIMITATIONS OF SUSCEPTIBILITY ASSESSMENT

This susceptibility assessment was comprehensive insofar that all available chemical data were evaluated in comparison to 50% of the respective MCL, for each of the subject wells for which data were furnished. Nevertheless, certain limitations of this assessment potentially remain associated with the following:

1. **Treatment Plants vs. Individual Wells** - The databases contain information specific to treatment plants, not necessarily to individual wells. Each chemical class was considered separately for each treatment plant, since composite groundwater samples could not be separated. Where more than one well shares a treatment plant, well-specific information generally was not available on which to base a well-specific evaluation of susceptibility. Blending and other operational protocols may affect well-specific susceptibilities in a manner not discernable through this assessment.

2. **Reliance on Existing Data** - Water samples were not collected and analyzed as a component of this SWA. In addition, the water quality databases that were used to support this assessment revealed sometimes-irregular sampling intervals. MDE advises that the SDWA regulations are such that different contaminants are sampled at different intervals and provide MDE with the authority to reduce the frequency of sampling based on the occurrence of a contaminant in the water supply and geology.

6.0 WELLHEAD AND SWA PROTECTION RECOMMENDATIONS

Chapters 1 through 5 of this report constitute the Source Water Assessment for the eastern Frederick County TNC systems, as required under the 1996 SDWA amendments. In concept, the system owners and their customers, tenants and guests benefit from a readily implemented plan for pro-active wellhead protection. Such protection efforts:

1. Provide measures to mitigate public health risks that may otherwise arise due to contamination of the groundwater supplies; and

2. Reduce the risk of future groundwater contamination of both natural and manmade origin.

6.1 WELLHEAD PROTECTION RECOMMENDATIONS; SYSTEM OWNERS AND OPERATORS

Bacteria (total coliform, *e. coli*) are the most common groundwater contaminant that is within the capability of individual system owners and operators to diagnose and correct. Many subject systems had positive bacteria sampling results, at one time or another. Such corrective efforts, therefore, appear warranted.

Based on the generally recurrent positive bacteria results that probably eliminate sample error, ALWI presently believes the elevated bacteria concentrations to be a consequence of incomplete disinfection and/or pervasive anthropogenic bacteria sources. GWUDI determinations and other conclusions seem premature before aggressive shock-chlorination and additional sampling is performed. The causes of bacteriologic contamination may include casing perforations, leakage past the bottom of an incompletely seated casing, debris on the pump column, foreign matter in the well, insects and larvae within the well cap and other sources.

Chlorination and/or ultraviolet disinfection should be considered for those wells wherein bacteriologic contamination persists and wherein potability cannot be restored through redevelopment coupled with aggressive shock chlorination. In the event that GWUDI is confirmed the water system can (1) replace the GWUDI well with a new well, (2) reconstruct or rehabilitate the existing well to a non-GWUDI condition, and/or (3) install filtration that meets EPA/MDE requirements. We note that in some areas it may not be possible to drill a new well, or to rehabilitate a well, that would not still be GWUDI.

Focusing on wellhead maintenance and protection for sanitation and maintenance of a disinfected supply, ALWI offers the following additional recommendations to the individual system owners:

1. **Maintain Integrity of Well and Supply System** - A copy of the FCHD sanitary survey for the well(s) should be obtained and reviewed. Any defects in sanitation should be corrected, and the system should be disinfected following such work. Installing new two-piece well caps with insect-proof screens is a good way to reduce potential bacteriologic contamination from entering the well from its cap. Caulking the electrical conduit also helps to maintain a sanitary seal at the wellhead.

2. **Wells Near USTs** - Wells identified to be at risk from USTs should be sampled for volatile organic compounds annually if no UST releases are verified, or quarterly (or more often if directed by the MDE Oil Control Program) if a release in the SWA has been verified. Corrective action, as necessary, will help protect the health of regular consumers.

3. **Out-of-Service Wells** - PWSID No. 1101111 (03) is an unused and disconnected well. Such a well potentially constitutes a short-circuit pathway for the downward migration of contamination into the aquifer. While the owner may seek to keep the well for emergency or

backup uses, COMAR 26.04.04.11.D(2)a requires that unused and unneeded wells be abandoned and sealed. MDE and/or FCHD may wish to consider advising the owner of the potential contamination threat associated with the disconnected well, and to encourage proper abandonment.

4. **Wellhead Vehicular and Tampering Hazard Reduction** - ALWI recommends continued protection of the wellheads from vehicular hazards. We also recommend grading to redirect storm water away from the wellheads. Water treatment chemicals should be stored in secondary containment devices to protect against leaks or spills. All outdoor wellheads not currently protected by locks, bunkers and/or fences should have these or other types of equally protective devices installed.

5. **Roadway and Parking Lot Deicing** - The owners of subject TNC wells should be encouraged to use abrasives and calcium chloride formulations as roadway and parking lot deicer. If the data exist, restrictions in the use of conventional road salt should be predicated on existing sodium and chloride concentrations in the aquifer.

6. **Wells in Flood-Prone Areas** - Wells in areas subject to flooding, naturally or from stormwater, should be sampled for total coliform bacteria, *e. coli* and other contaminants following significant rain events (e.g., 0.5 inch in a 24 hour period) to verify the continued potability of the water. Corrective action may be necessary based on the results, including but not restricted to casing extensions, installation of disinfection systems, installation of filtration systems, redirection of floodwaters, and/or abandonment and replacement.

7. **Wells Serving Seasonal Facilities** - Water systems for seasonal facilities, such as campgrounds, should be disinfected and flushed prior to the opening of a new season.

8. **Be Cognizant of Land Use Changes; Participate in Public Processes** - System owners should keep track of potential changes in local zoning and land use within the individual SWA areas that might impact groundwater quality. Participation in public meetings and hearings, on issues such as planning, zoning and development, may help local officials be cognizant of groundwater quality issues and integrate such concerns in decision-making.

In summary, we recommend that tests for total coliform bacteria and *e. coli* be performed on a periodic basis as determined by MDE and FCHD. If treatment is provided, both pre- and post-treatment water should be sampled. Total coliform bacteria testing results are a good indication of the sanitary integrity of the system. *E. coli* analyses help diagnose the specific source and cause of a positive total coliform bacteria result because *e. coli* are present in the feces of warm-blooded animals. All positive results should be investigated, with the cause then corrected. Sources with chronic *e. coli* contamination should be rehabilitated, disinfected and filtered, or abandoned and replaced.

6.2 SWA Area Management Recommendations; MDE and FCHD

Many wellhead protection objectives are most commonly achieved via ordinance or restrictive covenant. However, ordinance-based wellhead protection is easier to implement at the municipal scale. ALWI believes that ordinances imposing greater land use restrictions than already within

COMAR would be difficult to support, enact and enforce. Within this limitation, we recommend focus on wellhead integrity improvements, materials storage improvements, confirmatory sampling, treatment retrofits where necessary and/or use of bottled supplies in lieu of potentially costly repairs and rehabilitation measures.

6.2.1 Nitrate - Nitrogen Hazard Reduction Strategies

Nitrates are inorganic compounds that originate as non-point source contamination from the fertilization of farm fields and related practices of agricultural origin. Nitrates also can arise from point sources, such as sewage storage and disposal systems in the SWA areas or in upgradient areas. It is possible that the elevated nitrate concentration recorded for many of the subject TNCs is a combination of both point- and non-point sources.

Specific recommendations to mitigate the nitrate hazard are provided below. The order of these recommendations reflects ALWI's judgment of their relative benefit:

1. **Enhanced Treatment for New Septic Systems** - Nitrate-nitrogen likely is of anthropogenic origin, suggesting that appropriately conceived and executed strategies may mitigate the hazard and/or reduce risk of contamination. ALWI recommends that the owners of new septic systems within the SWA areas be encouraged to have advanced pre-treatment systems or recirculating sand filter systems.

2. **Community Outreach to Agricultural Land Owners and Tenant Farmers** - MDE and/or FCHD may consider an area-wide community outreach and awareness program, concentrating on agricultural landowners. ALWI recommends that assistance be solicited from local agricultural extension officials in contacting and educating affected parties as to the benefits of adopting nutrient management practices. MDE and/or FCHD also should consider a mass mailing with pertinent information on source reduction and nutrient management, to owners of the subject TNCs, as a measure to educate them on contamination issues.

6.2.2 Household Hazardous Waste Collection Days; Dumping Mitigation

ALWI recommends that MDE and FCHD jointly establish and maintain a program for household hazardous waste collection days. We also recommend that existing informal refuse disposal practices in the SWA areas cease; letters to the affected PWSID owners may accomplish this goal. Any dumping areas or informal vehicle storage area should be cleaned up by the affected property owners to the degree financially feasible.

7.0 CONCLUSIONS

In preparing this SWA report and specifically the conclusions enumerated below, ALWI has utilized its best level of effort consistent with its professional standards, present scientific judgment and knowledge. We have upheld accepted industry practice and prepared this SWA report within the budgetary and work scope limitations set forth in its contract with MDE. Subject to this provision and the assumptions and exclusions specified and mutually agreed in the aforementioned contract and/or referenced herein, our conclusions follow:

1. **SWA Area Delineations** - In accordance with the 1999 MDE SWAP, ALWI delineated SWA areas around each subject TNC (Table 1) as having a fixed radius of 1,000 feet.

2. **Contamination Hazards** - ALWI identified and catalogued existing and potential contaminant hazards in each SWA area in accordance with the 1999 MDE SWAP. Not all hazards are equal in immediacy, proximity and condition. Hazards are mapped within Appendix A and summarized in Table 2.

3. **Quantitative Susceptibility Assessment** - For the most part, we found that many of the wells are susceptible to nitrate and/or bacteriologic contamination (Tables 3 and 4). Some of the reported bacteriologic concentrations of these contaminants already have risen to levels where proactive rehabilitation and/or treatment seem warranted. In most of the other wells, nitrate concentrations approach or exceed 50% of the respective MCL, wherein continued close monitoring is warranted but treatment seems premature and possibly unnecessary.

8.0 SELECTED REFERENCES

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Table 1: Summary Table of Subject TNCs

System Name	PWSID	Source ID	Source Type	Tag Number	Wellhead Integrity	Hazards / Concerns[2]	Year Drilled	Aquifer Unit[3]
6-10 Gas Mart	1101001	1	GW	unknown	satisfactory	4 USTs observed nearby	unknown	Ijamsville Formation
Wilcom Concessions	1101002	1	GW	FR-67-0495	satisfactory	none at wellhead	1967	Sams Creek Metabasalt
Wilcom Concessions	1101002	2	GW	unknown	satisfactory	none at wellhead	unknown	Sams Creek Metabasalt
Bush Creek Church Of Brethren	1101026	1	GW	FR-02-8405	satisfactory	none at wellhead	1957	Ijamsville Formation
Franklin Liquors	1101066	2	GW	FR-94-4001	satisfactory	none at wellhead	unknown	Urbana Formation
Gabriel's	1101072	1	GW	FR-81-1403	satisfactory	UST observed nearby	1984	Ijamsville Formation
Green Valley Animal Hospital	1101080	1	GW	FR-73-3238	satisfactory	UST observed nearby	1976	Sams Creek Metabasalt
St. Luke Hallowood Retreat Center	1101085	1	GW	FR-88-4938	satisfactory	none at wellhead	1996	Sugarloaf Mountain Quartzite
Hamilton's Lounge	1101086	1	GW	unknown	not visible	underground	unknown	Ijamsville Formation
Holly Hills Country Club	1101097	1	GW	FR-88-2801	satisfactory	none at wellhead	1992	Urbana Formation
Johnsville UMC	1101110	1	GW	FR-73-1870	satisfactory	none at wellhead	1974	Ijamsville Formation
Jug Bridge Seafood	1101111	1	GW	FR-81-2321	satisfactory	disconnected well observed nearby	1985	Ijamsville Formation
Jug Bridge Seafood	1101111	2	GW	FR-88-0788	satisfactory	disconnected well observed nearby	1989	Ijamsville Formation
Jug Bridge Seafood	1101111	3	GW	unknown	satisfactory	disconnected well	unknown	Ijamsville Formation
Kemptown Store	1101112	2	GW	FR-73-7388	satisfactory	UST observed nearby	1979	Marburg Schist
Liberty Methodist Church	1101120	1	GW	FR-02-4587	satisfactory	3 USTs in MDE database	1956	Ijamsville Formation
Liberty Methodist Church	1101120	2	GW	FR-88-1839	not visible	enclosed; 3 USTs in MDE database	1990	Ijamsville Formation
Libertytown Vol. Fire Co.	1101122	1	GW	FR-66-0509	satisfactory	3 USTs in MDE database	1966	Ijamsville Formation
Linganore Grange Hall	1101124	2	GW	FR-88-1407	satisfactory	none at wellhead	unknown	Metarhyolite/Libertyville
Mealeys - New Market Hotel Corp	1101132	1	GW	FR-67-0472	satisfactory	none at wellhead	1967	Sams Creek Metabasalt
Hilltop Convenience Store	1101135	1	GW	FR-88-3014	satisfactory	none at wellhead	1992	Urbana Formation
New Market Grange #362	1101145	1	GW	FR-65-0142	satisfactory	none at wellhead	1964	Sams Creek Metabasalt
New Market Vol. Fire Co.	1101146	2	GW	FR-81-1125	satisfactory	4 USTs in MDE database	1983	Sams Creek Metabasalt
New Market Vol. Fire Co.	1101146	1	GW	FR-81-0366	satisfactory	4 USTs in MDE database	1982	Sams Creek Metabasalt
Monocacy Crossing	1101150	1	GW	FR-81-2700	satisfactory	nearby gw discharge in MDE database	1985	Ijamsville Formation
Providence UMC	1101155	2	GW	FR-81-3655	satisfactory	UST observed nearby	1986	Marburg Schist
Providence UMC	1101155	1	GW	FR-81-3787	satisfactory	UST observed nearby	1986	Marburg Schist
Rocky Hill Lutheran Church	1101159	1	GW	unknown	satisfactory	none at wellhead	unknown	Ijamsville Formation
Libertytown Shopping Center	1101163	3	GW	FR-81-5965	satisfactory	none at wellhead	unknown	Ijamsville Formation
Libertytown Shopping Center	1101163	1	GW	FR-73-7635	satisfactory	none at wellhead	1980	Ijamsville Formation
Libertytown Shopping Center	1101163	2	GW	FR-88-1901	satisfactory	none at wellhead	1990	Ijamsville Formation
Urbana VFD	1101202	1	GW	FR-81-1419	satisfactory	UST observed nearby	1984	Urbana Formation
Urbana VFD	1101202	2	GW	FR-73-3978	unsatisfactory[1]	casing corroded; UST observed nearby	1977	Urbana Formation
Village Tea Room	1101204	1	GW	unknown	satisfactory	4 USTs in MDE database	unknown	Sams Creek Metabasalt
Wesley Chapel UMC	1101207	1	GW	unknown	not visible	underground; 3 USTs observed nearby	unknown	Urbana Formation
Wilcom's Inn	1101210	1	GW	FR-67-0494	satisfactory	none at wellhead	1967	Sams Creek Metabasalt
Anna Prayer	1101229	1	GW	FR-88-0654	satisfactory	none at wellhead	1989	Urbana Formation
Anna Prayer	1101229	3	GW	FR-81-4799	satisfactory	none at wellhead	unknown	Urbana Formation
Anna Prayer	1101229	2	GW	FR-88-4553	satisfactory	none at wellhead	1995	Urbana Formation
MD Sheriffs Boys Ranch	1101233	3	GW	FR-81-0021	satisfactory	2 USTs observed nearby	1981	Ijamsville Formation

[1] See report Section 4.3 for details.

[2] See Table 2 for a more detailed description of the hazards associated with each well.

[3] Aquifer unit determined through the use of *Rocks of the South Mountain Anticlinorium and Frederick Valley* (Maryland Geological Survey 2000).

Table 1: Summary Table of Subject TNCs (continued)

System Name	PWSID	Source ID	Source Type	Tag Number	Wellhead Integrity	Hazards / Concerns [2]	Year Drilled	Aquifer Unit [3]
MD Sheriffs Boys Ranch	1101233	4	GW	FR-94-2183	satisfactory	2 USTs observed nearby	2000	Ijamsville Formation
MD Sheriffs Boys Ranch	1101233	1	GW	FR-73-7805	satisfactory	2 USTs observed nearby	1980	Ijamsville Formation
MD Sheriffs Boys Ranch	1101233	5	GW	FR-94-2252	satisfactory	2 USTs observed nearby	2000	Ijamsville Formation
MD Sheriffs Boys Ranch	1101233	2	GW	FR-73-7375	not visible	underground; 2 USTs observed nearby	1980	Ijamsville Formation
Kemptown Community Park	1101243	1	GW	FR-81-0153	satisfactory	none at wellhead	1982	Marburg Schist
Sugarloaf Mountain Park	1101248	1	GW	unknown	satisfactory	none at spring	unknown	Sugarloaf Mountain Quartzite
Sugarloaf Mountain Park	1101248	2	GW	FR-94-3237	satisfactory	UST observed nearby	unknown	Sugarloaf Mountain Quartzite
Four County Exxon	1101253	1	GW	FR-81-2790	satisfactory	7 USTs observed nearby	1985	Marburg Schist
New Market General Store	1101254	1	GW	FR-81-5600	satisfactory	none at wellhead	1988	Sams Creek Metabasalt
Liberty Road Seafood	1101270	1	GW	FR-81-3533	satisfactory	none at wellhead	1986	Ijamsville Formation
Liberty Road Seafood	1101270	2	GW	unknown	unsatisfactory [1]	damaged cap	unknown	Ijamsville Formation
Morningside Inn	1101273	2	GW	unknown	satisfactory	none at wellhead	unknown	Ijamsville Formation
Morningside Inn	1101273	1	GW	FR-88-3901	satisfactory	none at wellhead	1994	Ijamsville Formation
Stronghold Mansion	1101274	2	GW	FR-88-2880	satisfactory	none at wellhead	1992	Sugarloaf Mountain Quartzite
Pleasant Grove UMC	1101285	1	GW	FR-81-5144	satisfactory	none at wellhead	1987	Urbana Formation
Life In Jesus Berea House	1101291	1	GW	FR-88-4960	satisfactory	none at wellhead	1996	Metarhyolite/Libertyville
Life In Jesus Berea House	1101291	2	GW	FR-81-4779	satisfactory	none at wellhead	1987	Metarhyolite/Libertyville
Chapel Lutheran Church	1101295	1	GW	FR-88-4504	satisfactory	none at wellhead	1995	Ijamsville Formation
Flint Hill UMC	1101296	1	GW	unknown	satisfactory	none at wellhead	unknown	Urbana Formation
PB Dye Golf Club	1101300	1	GW	FR-94-0986	satisfactory	none at wellhead	1998	Urbana Formation
Shell Oil Co.	1101302	1	GW	FR-94-1149	satisfactory	7 USTs observed nearby	1998	Marburg Schist
St. Peter's Parish Center	1101305	2	GW	unknown	satisfactory	3 USTs in MDE database	unknown	Ijamsville Formation
St. Peter's Parish Center	1101305	1	GW	FR-88-1661	satisfactory	3 USTs in MDE database	1990	Ijamsville Formation
St. Peter's Parish Center	1101305	3	GW	unknown	satisfactory	3 USTs in MDE database	unknown	Ijamsville Formation
St. Peter's Parish Center	1101305	4	GW	unknown	satisfactory	3 USTs in MDE database	unknown	Ijamsville Formation
Urbana Convenience Shop (Exxon)	1101310	1	GW	unknown	satisfactory	3 USTs observed nearby	unknown	Urbana Formation
Worthington Manor Golf Club	1101311	1	GW	FR-94-0357	satisfactory	none at wellhead	1997	Urbana Formation
Whiskey Creek Golf Course	1101314	2	GW	FR-94-1940	satisfactory	none at wellhead	1999	Sams Creek Metabasalt
Libertytown Park	1101318	1	GW	FR-94-0241	satisfactory	3 USTs in MDE database	1997	Ijamsville Formation
Libertytown Park	1101318	2	GW	FR-94-0242	satisfactory	3 USTs in MDE database	1997	Ijamsville Formation
Hope Valley Golf Course	1101320	1	GW	FR-73-4511	satisfactory	none at wellhead	1977	Ijamsville Formation
Camp Genstar	1101325	1	GW	unknown	satisfactory	none at wellhead	unknown	Urbana Formation

Table 2: Point-Source Contamination Hazards

Associated System Name	Associated PWSID	Regulated Entity (Hazard) Name	Regulated Entity (Hazard) Address	Nature of Hazard [1]	Basis [2]	Chemical Class	Figure No.	Figure ID
6-10 Gas Mart	1101001	6-10 Gas Mart	1904 Urbana Pike, Clarkesville, MD 20871	UST (4)	Field Identified	VOC	A-11	A
Gabriel's	1101072	Gabriel's	4730 Ijamsville Road, Ijamsville, MD 21754	UST (1)	Field Identified	unknown	A-5	A
Green Valley Animal Hospital	1101080	Green Valley Animal Hospital	2910 Prices Distillery Road, Ijamsville, MD 21754-9322	UST (1)	Field Identified	VOC	A-9	A
Monocacy Crossing	1101150	Stup's Auto Center	8052 Ball Road, Frederick, MD 21704	gw discharge	MDE Database	IOC/nitrates	A-7	A
Urbana VFD	1101202	Lawson's Automotive Service	3565 Urbana Pike, Frederick, MD 21704-7788	UST (1)	Field Identified	unknown	A-7	B
MD Sheriffs Boys Ranch	1101233	MD Sheriffs Boys Ranch	4902 Route 80, Buckeystown, MD 21717	UST (2)	Field Identified	VOC	A-7	C
Sugarloaf Mountain Park	1101248	Stronghold, Inc. (Admin. Building)	7901 Comus Road, 20842	UST (1)	MDE Database	VOC	A-12	A
Various	1101112, 1101155	Kemptown Store	12516 Fingerboard Road, Monrovia, MD 21770	UST (1)	Field Identified	unknown	A-8	A
Various	1101120, 1101122, 1101305, 1101318	M & N Quick Shop	12052 Main Street, Libertytown, MD 21762	UST (3)	MDE Database	VOC	A-2	A
Various	1101146, 1101204	Hahn Transportation, Inc.	90 W. Main Street, 21774	UST (4)	MDE Database	VOC	A-6	A
Various	1101207, 1101310	Urbana Convenience Shop (Exxon)	8816 Fingerboard Road, Frederick, MD 21701	UST (3)	Field Identified	VOC	A-7	D
Various	1101253, 1101302	Four County Exxon	Route 27 & I-70, Mt Airy, MD 21771	UST (4)	Field Identified	VOC	A-8	B
Various	1101253, 1101302	Shell Oil Co.	649 Lakeview Drive, Mt Airy, MD 21771	UST (3)	Field Identified	VOC	A-8	C

[1] The number in parentheses indicates the number of underground storage tanks (USTs) that were observed within the Source Water Assessment area for that particular regulated entity.

[2] Basis explains which source the recorded hazard came from. In the case where "MDE Database" is listed, that particular hazard was not field identified but was included in this table for conservatism.

Table 3: Bacteriologic Contaminant Susceptiblity Table

Site Name	PWSID	Type of Bacteria	Units (Dry/Wet)[1]	Total Samples	Positive Samples	% Positive[2]	Time Period Positive	Max. Conc. Detected	Period of Record	Interpretive Bacteriologic Susceptibility (yes/no)
6-10 Gas Mart	1101001	Total Coliform	col./100 mL	18	6	33%	1999-2001	200	1997-2003	Yes
Wilcom Concessions	1101002	Total Coliform	col./100 mL	22	3	14%	2000-2002	18	1997-2003	Yes
			Dry (S1)	2	1	50%	2001	46	2001	
			Wet (S1)	8	8	100%	2001	500	2001	
Bush Creek Church of Brethren	1101026	Total Coliform	col./100 mL	39	12	31%	1996-2003	>0[3]	1996-2003	Yes
			Dry (S1)	2	0	0%	None	None	2001	
			Wet (S1)	8	0	0%	None	None	2001	
		E. Coli	col./100 mL	39	1	3%	1996	>0[3]	1996-2003	
			Dry (S1)	2	0	0%	None	None	2001	
			Wet (S1)	8	0	0%	None	None	2001	
Franklin Liquors	1101066	Total Coliform	col./100 mL	82	33	40%	1996-2003	22	1996-2004	Yes
			Dry (S1)	2	1	50%	2001	1	2001	
			Wet (S1)	8	5	63%	2001-2002	35	2001-2002	
		E. Coli	col./100 mL	82	6	7%	1997-1998	>0[3]	1996-2004	
			Dry (S1)	2	0	0%	None	None	2001	
			Wet (S1)	8	0	0%	None	None	2001-2002	
Gabriel's	1101072	Total Coliform	col./100 mL	36	13	36%	1998-2001	200	1997-2003	Yes
Green Valley Animal Hospital	1101080	Total Coliform	col./100 mL	16	0	0%	None	None	2000-2003	No
			Dry (S1)	2	0	0%	None	None	2001	
			Wet (S1)	8	2	25%	2001	1	2001	
St. Luke Hallowood Retreat Center	1101085	Total Coliform	col./100 mL	43	1	2%	2000	1	1996-2003	No
Hamilton's Lounge	1101086	Total Coliform	col./100 mL	44	10	23%	1997-2000	>0[3]	1996-2003	No
Johnsville UMC	1101110	Total Coliform	col./100 mL	50	15	30%	1996-2003	200	1996-2003	Yes
		E. Coli	col./100 mL	50	2	4%	1997	>0[3]	1996-2003	
Jug Bridge Seafood	1101111	Total Coliform	col./100 mL	18	8	44%	2002	11	1998-2003	Yes
Kemptown Store	1101112	Total Coliform	col./100 mL	38	11	29%	2000-2003	>0[3]	1997-2003	Yes
Libertytown Volunteer Fire Company	1101122	Total Coliform	col./100 mL	19	6	32%	1996-2001	200	1996-2003	Yes

[1] For systems with multiple sources, parenthetical designations indicate the specific source sampled (i.e., S1 indicates Source 1, and S2 indicates Source 2).

[2] Overall susceptibility to bacteria largely was guided on a 25% occurrence threshold. Those systems with positive results 25% of the time or more generally were deemed susceptible.

[3] In certain instances, laboratory reports indicated "presence" or "absence" of coliform bacteria, without quantitation.

Table 3: Bacteriologic Contaminant Susceptiblity Table (continued)

Site Name	PWSID	Type of Bacteria	Units (Dry/Wet)[1]	Total Samples	Positive Samples	% Positive[2]	Time Period Positive	Max. Conc. Detected	Period of Record	Interpretive Bacteriologic Susceptibility (yes/no)
Linganore Grange Hall	1101124	Total Coliform	col./100 mL	26	2	8%	2003	1	1996-2003	No
Mealey's (New Market Hotel Corp.)	1101132	Total Coliform	col./100 mL	56	13	23%	1996-2002	6	1996-2003	No
			Dry (S1)	2	1	50%	2001	1	2001	
			Wet (S1)	8	0	0%	None	None	2001-2002	
Hilltop Convenience Store	1101135	Total Coliform	col./100 mL	34	8	24%	1999-2002	83	1996-2003	No
			Dry (S1)	2	1	50%	2001	3	2001	
			Wet (S1)	8	1	13%	2001	4.2	2001	
New Market Grange #362	1101145	Total Coliform	col./100 mL	36	18	50%	1997-2001	70	1997-2003	Yes
			Dry (S1)	2	2	100%	2001	45	2001	
			Wet (S1)	8	1	13%	2002	83.1	2002	
New Market Volunteer Fire Company	1101146	Total Coliform	col./100 mL	29	6	21%	2000-2002	>0[3]	1998-2003	No
Monocacy Crossing	1101150	Total Coliform	col./100 mL	92	36	39%	1996-1997	200	1996-2003	Yes
		E. Coli	col./100 mL	92	12	13%	1996-1997	200	1996-2003	
Providence UMC	1101155	Total Coliform	col./100 mL	21	5	24%	2000	>0[3]	1997-2003	No
Rocky Hill Lutheran Church	1101159	Total Coliform	col./100 mL	35	2	6%	2000-2002	3	1998-2003	No
		E. Coli	col./100 mL	35	9	26%	1998-2000	48	1998-2003	
Libertytown Shopping Center	1101163	Total Coliform	col./100 mL	22	3	14%	2001	>0[3]	2000-2003	No
Urbana VFD	1101202	Total Coliform	col./100 mL	44	3	7%	1998	>0[3]	1996-2003	No
Village Tea Room	1101204	Total Coliform	col./100 mL	43	12	28%	1996-2000	6	1996-2003	Yes
			Dry (S1)	2	1	50%	2001	36	2001	
			Wet (S1)	8	6	75%	2001	3.1	2001	
Wesley Chapel UMC	1101207	Total Coliform	col./100 mL	38	5	13%	2003-2004	200	1997-2004	Yes
Wilcom's Inn	1101210	Total Coliform	col./100 mL	20	1	5%	2002	200	1997-2003	Yes
			Dry (S1)	2	2	100%	2001	85	2001	
			Wet (S1)	8	7	88%	2002	200.5	2002	
		E. Coli	col./100 mL	20	2	10%	2001-2002	130	1997-2003	
			Dry (S1)	2	2	100%	2001	140	2001	
			Wet (S1)	8	3	38%	2002	56	2002	

[1] For systems with multiple sources, parenthetical designations indicate the specific source sampled (i.e., S1 indicates Source 1, and S2 indicates Source 2).

[2] Overall susceptibility to bacteria largely was guided on a 25% occurrence threshold. Those systems with positive results 25% of the time or more generally were deemed susceptible.

[3] In certain instances, laboratory reports indicated "presence" or "absence" of coliform bacteria, without quantitation.

Table 3: Bacteriologic Contaminant Susceptiblity Table (continued)

Site Name	PWSID	Type of Bacteria	Units (Dry/Wet)[1]	Total Samples	Positive Samples	% Positive[2]	Time Period Positive	Max. Conc. Detected	Period of Record	Interpretive Bacteriologic Susceptibility (yes/no)
Anna Prayer	1101229	Total Coliform	col./100 mL	36	11	31%	1996-2002	200	1996-2003	Yes
Maryland Sheriffs Boys Ranch	1101233	Total Coliform	col./100 mL	53	15	28%	1997-2001	200	1997-2003	Yes
Four County Exxon	1101253	Total Coliform	col./100 mL	29	5	17%	1998-2002	>0[3]	1996-2003	No
New Market General Store	1101254	Total Coliform	col./100 mL	59	11	19%	1998-2003	2	1998-2003	No
			Dry (S1)	2	1	50%	2001	1	2001	
			Wet (S1)	8	1	13%	2001	2	2001	
Liberty Road Seafood	1101270	Total Coliform	col./100 mL	25	8	32%	1998-2002	45	1997-2003	Yes
Morningside Inn	1101273	Total Coliform	col./100 mL	58	16	28%	1998-2003	200	1997-2003	Yes
Stronghold Mansion	1101274	Total Coliform	col./100 mL	31	12	39%	2000	50	1996-2003	Yes
Pleasant Grove UMC	1101285	Total Coliform	col./100 mL	49	21	43%	1997-2000	32	1997-2003	Yes
			Dry (S1)	2	2	100%	2001	51	2001	
			Wet (S1)	8	8	100%	2002	200.5	2002	
		E. Coli	col./100 mL	49	3	6%	1997-1998	2	1997-2003	
			Dry (S1)	2	1	50%	2001	2	2001	
			Wet (S1)	8	7	88%	2002	45.3	2002	
Life In Jesus Berea House	1101291	Total Coliform	col./100 mL	33	11	33%	1998-2001	200	1998-2003	Yes
		E. Coli	col./100 mL	33	1	3%	2001	1	1998-2003	
Flint Hill UMC	1101296	Total Coliform	col./100 mL	28	3	11%	2000-2002	613	1998-2003	No
		E. Coli	col./100 mL	28	5	18%	2000	4	1998-2003	
Shell Oil Company	1101302	Total Coliform	col./100 mL	16	3	19%	1999-2000	12	1999-2003	No
St. Peter's Parish Center	1101305	Total Coliform	col./100 mL	52	4	8%	2000-2003	200	2000-2003	Yes
Urbana Convenience Shop (Exxon)	1101310	Total Coliform	col./100 mL	30	7	23%	1999-2003	18	1997-2003	Yes
Whiskey Creek Golf Course	1101314	Total Coliform	col./100 mL	17	6	35%	2003	>0[3]	2000-2003	Yes
			Dry (S1)	2	1	50%	2001	2	2001	
			Wet (S1)	8	0	0%	None	None	2001-2002	
Camp Genstar	1101325	Total Coliform	col./100 mL	22	9	41%	2003	8	2003	Yes

[1] For systems with multiple sources, parenthetical designations indicate the specific source sampled (i.e., S1 indicates Source 1, and S2 indicates Source 2).

[2] Overall susceptibility to bacteria largely was guided on a 25% occurrence threshold. Those systems with positive results 25% of the time or more generally were deemed susceptible.

[3] In certain instances, laboratory reports indicated "presence" or "absence" of coliform bacteria, without quantitation.

Table 4: Chemical Contaminant Susceptibility Table

Site Name	PWSID	Compound > or = 50% of the MCL	Units	MCL (> or =)[1]	50% MCL (> or =)[2]	Total Samples	% Exc.	Time Period > or = 50% of the MCL	Max. Conc. Detected	Period of Record	**Interpretive Susceptibility (yes/no)**
Franklin Liquors	1101066	Nitrate	mg/L	10 (0)	5 (1)	7	14%	2003	5.3	1997-2003	Yes
Liberty Methodist Church	1101120	Nitrate	mg/L	10 (0)	5 (5)	5	100%	2000-2003	9.8	2000-2003	Yes
Linganore Grange Hall	1101124	Nitrate	mg/L	10 (0)	5 (3)	5	60%	2001-2003	6.1	2000-2003	Yes
Mealey's (New Mark. Hotel Corp.)	1101132	Nitrate	mg/L	**10 (2)**	5 (8)	12	83%	1997-2003	10.2	1996-2003	Yes
Hilltop Convenience Store	1101135	Nitrate	mg/L	10 (0)	5 (1)	4	25%	2003	5.6	2000-2003	Yes
Providence UMC	1101155	Nitrate	mg/L	10 (0)	5 (1)	5	20%	2002	6.2	2000-2003	No
Rocky Hill Lutheran Church	1101159	Nitrate	mg/L	10 (0)	5 (3)	5	60%	2001-2003	6.7	2000-2003	Yes
Libertytown Shopping Center	1101163	Nitrate	mg/L	10 (0)	5 (4)	4	100%	2000-2003	9.7	2000-2003	Yes
Village Tea Room	1101204	Nitrate	mg/L	10 (0)	5 (4)	7	57%	2000-2003	6	1997-2003	Yes
Wesley Chapel UMC	1101207	Nitrate	mg/L	10 (0)	5 (6)	6	100%	2000-2003	7	2000-2003	Yes
Wilcom's Inn	1101210	Nitrate	mg/L	10 (0)	5 (6)	9	67%	1998-2003	5.8	1996-2003	Yes
Anna Prayer	1101229	Nitrate	mg/L	**10 (7)**	5 (0)	15	47%	1997	29	1997-2003	Yes
Four County Exxon	1101253	Nitrate	mg/L	10 (0)	5 (6)	7	86%	1997-2002	7.3	1997-2003	Yes
New Market General Store	1101254	Nitrate	mg/L	10 (0)	5 (1)	6	17%	1998	5.5	1998-2003	No
Morningside Inn	1101273	Nitrate	mg/L	10 (0)	5 (4)	5	80%	2000-2003	8.1	2000-2003	Yes
Pleasant Grove UMC	1101285	Nitrate	mg/L	10 (0)	5 (1)	5	20%	2003	5.1	2000-2003	Yes
Life In Jesus Berea House	1101291	Nitrate	mg/L	10 (0)	5 (5)	5	100%	2000-2003	8.5	2000-2003	Yes
Flint Hill UMC	1101296	Nitrate	mg/L	10 (0)	5 (5)	6	83%	2000-2002	5.9	2000-2003	Yes
PB Dye Golf Club	1101300	Nitrate	mg/L	10 (0)	5 (3)	3	100%	2001-2003	9.08	2001-2003	Yes
Shell Oil Company	1101302	Nitrate	mg/L	**10 (5)**	5 (1)	9	67%	1999-2001	12	1999-2003	Yes
St. Peter's Parish Center	1101305	Nitrate	mg/L	10 (0)	5 (3)	16	19%	2000	9.39	2000-2003	Yes
Urbana Conven. Shop (Exxon)	1101310	Nitrate	mg/L	10 (0)	5 (2)	5	40%	2000	9.8	2000-2003	Yes
Libertytown Park	1101318	Nitrate	mg/L	10 (0)	5 (3)	3	100%	1999-2003	6.1	1999-2003	Yes

[1] The number in parentheses indicates the number of times the measurements were detected at or above the MCL.

[2] The number in parentheses indicates the number of times the measurements were detected at or above 50% of the MCL and below the MCL.

Appendix D: Data Supporting Chemical Susceptibility Determinations

Site Name	PWSID	Compound	Units	MCL	Sample Date	Sample Result
Franklin Liquors	1101066	Nitrate	mg/L	10	January 23, 2003	5.3
Liberty Methodist Church	1101120	Nitrate	mg/L	10	March 27, 2000	7.3
					March 27, 2000	7.3
					March 26, 2001	8.2
					February 25, 2002	9.8
					March 19, 2003	6.6
Linganore Grange Hall	1101124	Nitrate	mg/L	10	March 20, 2001	5.4
					February 1, 2002	6.1
					January 28, 2003	5.4
Mealey's (New Market Hotel Corporation)	1101132	Nitrate	mg/L	10	January 16, 1997	6.7
					March 16, 1998	6.5
					February 24, 1999	7.4
					March 10, 2000	10.2
					March 10, 2000	10.2
					March 31, 2000	5.15
					March 31, 2000	5.15
					January 31, 2001	6.2
					February 1, 2002	6.1
					March 19, 2003	6.2
Hilltop Convenience Store	1101135	Nitrate	mg/L	10	January 29, 2003	5.6
Monocacy Crossing	1101150	Nitrate	mg/L	10	March 28, 2001	5.9
Providence UMC	1101155	Nitrate	mg/L	10	March 1, 2002	6.2
Rocky Hill Lutheran Church	1101159	Nitrate	mg/L	10	March 20, 2001	5.1
					February 5, 2002	5.9
					January 29, 2003	6.7
Libertytown Shopping Center	1101163	Nitrate	mg/L	10	April 28, 2000	9.1
					March 30, 2001	9
					February 9, 2002	9.5
					March 5, 2003	9.7
Village Tea Room	1101204	Nitrate	mg/L	10	March 14, 2000	6
					March 14, 2000	6
					January 31, 2001	5.4
					March 19, 2003	5.9
Wesley Chapel UMC	1101207	Nitrate	mg/L	10	February 2, 2000	6.4
					October 11, 2000	6.4
					September 19, 2001	6.4
					November 19, 2001	7
					March 15, 2002	6.3
					March 13, 2003	6.1
Wilcom's Inn	1101210	Nitrate	mg/L	10	January 27, 1998	5.8
					March 21, 2000	5.2
					March 21, 2000	5.2
					March 21, 2000	5.2
					January 31, 2002	5.7
					January 30, 2003	5.8

Appendix D: Data Supporting Chemical Susceptibility Determinations

Site Name	PWSID	Compound	Units	MCL	Sample Date	Sample Result
Anna Prayer	1101229	Nitrate	mg/L	10	January 14, 1997	26.5
					January 14, 1997	26
					February 3, 1997	27
					April 22, 1997	29
					April 22, 1997	29
					April 22, 1997	29
					April 22, 1997	29
Four County Exxon	1101253	Nitrate	mg/L	10	December 1, 1997	7.2
					December 21, 1998	7.3
					March 14, 2000	6.4
					March 14, 2000	6.4
					March 26, 2001	5.8
					February 28, 2002	6.7
New Market General Store	1101254	Nitrate	mg/L	10	October 6, 1998	5.5
Morningside Inn	1101273	Nitrate	mg/L	10	April 24, 2000	7.5
					April 24, 2000	7.5
					April 11, 2002	6.9
					March 5, 2003	8.1
Life In Jesus Berea House	1101291	Nitrate	mg/L	10	March 9, 2000	6.3
					March 9, 2000	6.3
					September 13, 2001	8.5
					January 18, 2002	8
					February 21, 2003	8.2
Flint Hill UMC	1101296	Nitrate	mg/L	10	February 21, 2000	5.2
					February 21, 2000	5.2
					November 22, 2000	5.9
					March 14, 2001	5.2
					February 13, 2002	5.3
					March 9, 2001	9.08
PB Dye Golf Club	1101300	Nitrate	mg/L	10	March 4, 2002	8.1
					March 13, 2003	8.4
Shell Oil Company	1101302	Nitrate	mg/L	10	August 9, 1999	10
					March 14, 2000	11.7
					March 14, 2000	11.7
					April 10, 2000	12
					April 10, 2000	12
					October 16, 2001	11.3
St. Peter's Parish Center	1101305	Nitrate	mg/L	10	February 8, 2000	9.39
					February 8, 2000	9.39
					October 13, 2000	6.91
Urbana Convenience Shop (Exxon)	1101310	Nitrate	mg/L	10	May 2, 2000	9.8
					May 2, 2000	9.8
Libertytown Park	1101318	Nitrate	mg/L	10	May 3, 1999	5.9
					July 5, 2001	6.1
					July 1, 2003	5.4
Pleasant Grove UMC	1101285	Nitrate	mg/L	10	March 26, 2003	5.1

July 02

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[illegible] NAME	PWSID	PWSource	[illegible]	[illegible]	PrecipAmt	PrecipDate	Sample Date	Sample Time	Cl2Resid	Temperature	pH level	Sampler	Turbidity	Total Coliforms	E.Coli Coliforms
WILCOMS INN	110-1210	RAW	FREDERICK	WET	0.55	7/14/02	7/14/02	12:30:00 PM	0.00	14.20	8.14	Onheiser, Mark	0.91	56.0	<1.0
WILCOMS INN	110-1210	RAW	FREDERICK	WET	0.55	7/14/02	7/15/02	2:10:00 PM	0.00	16.40	7.67	Onheiser, Mark	0.87	<1.0	<1.0
WILCOMS INN	110-1210	RAW	FREDERICK	WET	0.55	7/14/02	7/16/02	2:15:00 PM	0.00	12.20	7.04	Onheiser, Mark	0.58	47.8	<1.0
WILCOMS INN	110-1210	RAW	FREDERICK	WET	0.55	7/14/02	7/18/22	2:00:00 PM	0.00	14.10	7.06	Onheiser, Mark	0.49	38.4	<1.0
BURKITTSVILLE RURITAN CLUB	110-1025	RAW	FREDERICK	WET	0.88	7/14/02	7/15/02	9:30:00 AM	0.00	16.02	6.52	Onheiser, Mark	0.55	5.3	<1.0
BURKITTSVILLE RURITAN CLUB	110-1025	RAW	FREDERICK	WET	0.88	7/14/02	7/16/02	9:25:00 AM	0.00	21.20	7.88	Onheiser, Mark	0.23	13.7	<1.0
BURKITTSVILLE RURITAN CLUB	110-1025	RAW	FREDERICK	WET	0.88	7/14/02	7/17/02	9:20:00 AM	0.00	21.30	7.83	Onheiser, Mark	0.36	>200.5	>200.5
BURKITTSVILLE RURITAN CLUB	110-1025	RAW	FREDERICK	WET	0.88	7/14/02	7/18/02	9:20:00 AM	0.00	16.80	7.83	Onheiser, Mark	1.52	>200.5	32.4
GLADE VALLEY GOLF CLUB	110-1269	RAW	FREDERICK	WET	0.54	7/14/02	7/15/02	10:45:00 AM	0.00	19.90	8.02	Onheiser, Mark	1.09	5.3	<1.0
GLADE VALLEY GOLF CLUB	110-1269	RAW	FREDERICK	WET	0.54	7/14/02	7/16/02	10:35:00 AM	0.00	19.90	7.08	Onheiser, Mark	0.66	9.9	1.0
GLADE VALLEY GOLF CLUB	110-1269	RAW	FREDERICK	WET	0.54	7/14/02	7/17/02	10:30:00 AM	0.00	16.70	7.96	Onheiser, Mark	0.36	11.1	<1.0
GLADE VALLEY GOLF CLUB	110-1269	RAW	FREDERICK	WET	0.54	7/14/02	7/18/02	10:30:00 AM	0.00	14.60	7.06	Onheiser, Mark	0.73	6.4	<1.0
BUCKEYSTOWN INN	110-1190	RAW	FREDERICK	WET	0.64	7/14/02	7/15/02	12:30:00 PM	0.00	20.00	7.95	Onheiser, Mark	0.41	<1.0	<1.0
BUCKEYSTOWN INN	110-1190	RAW	FREDERICK	WET	0.64	7/14/02	7/16/02	12:20:00 PM	0.00	14.60	8.01	Onheiser, Mark	0.40	1.0	<1.0
BUCKEYSTOWN INN	110-1190	RAW	FREDERICK	WET	0.64	7/14/02	7/17/02	11:15:00 AM	0.00	17.40	8.02	Onheiser, Mark	0.26	5.3	<1.0
BUCKEYSTOWN INN	110-1190	RAW	FREDERICK	WET	0.64	7/14/02	7/18/02	11:45:00 AM	0.00	16.20	.7	Onheiser, Mark	0.52	<1.0	<1.0
NEW MARKET GRANGE #362	110-1145	RAW	FREDERICK	WET	0.55	7/14/02	7/15/02	1:15:00 PM	0.00	20.60	8.12	Onheiser, Mark	0.29	<1.0	<1.0
NEW MARKET GRANGE #362	110-1145	RAW	FREDERICK	WET	0.55	7/14/02	7/16/02	1:10:00 PM	0.00	19.80	8.5	Onheiser, Mark	0.43	<1.0	<1.0
NEW MARKET GRANGE #362	110-1145	RAW	FREDERICK	WET	0.55	7/14/02	7/17/02	1:15:00 PM	0.00	18.40	7.56	Onheiser, Mark	0.34	83.1	<1.0
NEW MARKET GRANGE #362	110-1145	RAW	FREDERICK	WET	0.55	7/14/02	7/18/02	12:30:00 PM	0.00	17.60	8.14	Onheiser, Mark	0.61	<1.0	<1.0
NEW MARKET VOL FIRE CO	110-1146	RAW	FREDERICK	WET	0.55	7/14/02	7/15/02	1:15:00 PM	0.00	15.40	6.96	Onheiser, Mark	0.43	20.7	<1.0
NEW MARKET VOL FIRE CO	110-1146	RAW	FREDERICK	WET	0.55	7/14/02	7/16/02	1:30:00 PM	0.00	20.10	7.06	Onheiser, Mark	0.52	2.0	<1.0
NEW MARKET VOL FIRE CO	110-1146	RAW	FREDERICK	WET	0.55	7/14/02	7/17/02	1:25:00 PM	0.00	17.10	6.11	Onheiser, Mark	0.43	<1.0	<1.0
NEW MARKET VOL FIRE CO	110-1146	RAW	FREDERICK	WET	0.55	7/14/02	7/18/02	1:00:00 PM	0.00	12.40	6.16	Onheiser, Mark	0.53	<1.0	<1.0
DRY samples below	PWSID	PWSource	[illegible]	[illegible]	PrecipAmt	PrecipDate	Sample Date	Sample Time	Cl2Resid	Temperature	pH level	Sampler	Turbidity	Total Coliforms	E.Coli Coliforms
Aug-02															
PLEASANT GROVE U M CHURCH	110-1265	RAW	FREDERICK	WET	0.73	8/5/02	8/6/02	11:15:00 AM	0.00	14.02	7.06	Onheiser, Mark	1.47	8.7	1.0
PLEASANT GROVE U M CHURCH	110-1265	RAW	FREDERICK	WET	0.73	8/5/02	8/7/02	11:15:00 AM	0.00	12.40	8.11	Onheiser, Mark	1.43	19.2	1.0
PLEASANT GROVE U M CHURCH	110-1265	RAW	FREDERICK	WET	0.73	8/5/02	8/8/02	11:25:00 AM	0.00	16.20	7.04	Onheiser, Mark	0.89	13.7	1.0
PLEASANT GROVE U M CHURCH	110-1265	RAW	FREDERICK	WET	0.73	8/5/02	8/9/02	11:00:00 AM	0.00	13.80	7.01	Onheiser, Mark	1.57	7.5	<1.0

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To: Travis Sterner

410.537.3157

July 02

[illegible] NAME	PWSID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] Date	Sample Date	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Turbidity	Total Coliforms	E Coli Coliforms
WILCOMS INN	110-1210	RAW	FREDERICK	WET	0.55	7/14/02	7/14/02	12:30:00 PM	0.00	14.20	8.14	Onheiser, Mark	0.91	56.0	<1.0
WILCOMS INN	110-1210	RAW	FREDERICK	WET	0.55	7/14/02	7/15/02	2:10:00 PM	0.00	18.40	7.67	Onheiser, Mark	0.87	<1.0	<1.0
WILCOMS INN	110-1210	RAW	FREDERICK	WET	0.55	7/14/02	7/16/02	2:15:00 PM	0.00	12.20	7.04	Onheiser, Mark	0.58	47.8	<1.0
WILCOMS INN	110-1210	RAW	FREDERICK	WET	0.55	7/14/02	7/18/22	2:00:00 PM	0.00	14.10	7.06	Onheiser, Mark	0.48	38.4	<1.0
BURKITTSVILLE RURITAN CLUB	110-1025	RAW	FREDERICK	WET	0.68	7/14/02	7/15/02	9:30:00 AM	0.00	18.02	8.52	Onheiser, Mark	0.56	5.3	<1.0
BURKITTSVILLE RURITAN CLUB	110-1025	RAW	FREDERICK	WET	0.68	7/14/02	7/16/02	9:25:00 AM	0.00	21.20	7.88	Onheiser, Mark	0.29	13.7	<1.0
BURKITTSVILLE RURITAN CLUB	110-1025	RAW	FREDERICK	WET	0.68	7/14/02	7/17/02	9:20:00 AM	0.00	21.30	7.83	Onheiser, Mark	0.36	>200.5	>200.5
BURKITTSVILLE RURITAN CLUB	110-1025	RAW	FREDERICK	WET	0.68	7/14/02	7/18/02	9:20:00 AM	0.03	16.80	7.83	Onheiser, Mark	1.52	>200.5	32.4
GLADE VALLEY GOLF CLUB	110-1269	RAW	FREDERICK	WET	0.54	7/14/02	7/15/02	10:45:00 AM	0.00	18.90	8.02	Onheiser, Mark	1.09	5.3	<1.0
GLADE VALLEY GOLF CLUB	110-1269	RAW	FREDERICK	WET	0.54	7/14/02	7/16/02	10:35:00 AM	0.00	15.80	7.08	Onheiser, Mark	0.66	9.9	1.0
GLADE VALLEY GOLF CLUB	110-1269	RAW	FREDERICK	WET	0.54	7/14/02	7/17/02	10:30:00 AM	0.00	16.70	7.98	Onheiser, Mark	0.36	11.1	<1.0
GLADE VALLEY GOLF CLUB	110-1269	RAW	FREDERICK	WET	0.54	7/14/02	7/18/02	10:30:00 AM	0.00	14.60	7.06	Onheiser, Mark	0.73	6.4	<1.0
BUCKEYSTOWN INN	110-1190	RAW	FREDERICK	WET	0.64	7/14/02	7/15/02	12:30:00 PM	0.00	20.00	7.85	Onheiser, Mark	0.41	<1.0	<1.0
BUCKEYSTOWN INN	110-1190	RAW	FREDERICK	WET	0.64	7/14/02	7/16/02	12:20:00 PM	0.00	14.60	8.01	Onheiser, Mark	0.40	1.0	<1.0
BUCKEYSTOWN INN	110-1190	RAW	FREDERICK	WET	0.64	7/14/02	7/17/02	11:15:00 AM	0.00	17.40	8.02	Onheiser, Mark	0.26	5.3	<1.0
BUCKEYSTOWN INN	110-1190	RAW	FREDERICK	WET	0.64	7/14/02	7/18/02	11:45:00 AM	0.00	18.20	7	Onheiser, Mark	0.52	<1.0	<1.0
NEW MARKET GRANGE #362	110-1145	RAW	FREDERICK	WET	0.55	7/14/02	7/15/02	1:15:00 PM	0.00	20.60	8.12	Onheiser, Mark	0.28	<1.0	<1.0
NEW MARKET GRANGE #362	110-1145	RAW	FREDERICK	WET	0.55	7/14/02	7/16/02	1:10:00 PM	0.03	19.80	8.5	Onheiser, Mark	0.43	<1.0	<1.0
NEW MARKET GRANGE #362	110-1145	RAW	FREDERICK	WET	0.55	7/14/02	7/17/02	1:15:00 PM	0.00	18.40	7.93	Onheiser, Mark	0.34	83.1	<1.0
NEW MARKET GRANGE #362	110-1145	RAW	FREDERICK	WET	0.55	7/14/02	7/18/02	12:30:00 PM	0.00	17.60	8.14	Onheiser, Mark	0.61	<1.0	<1.0
NEW MARKET VOL FIRE CO	110-1146	RAW	FREDERICK	WET	0.55	7/14/02	7/15/02	1:15:00 PM	0.00	15.40	6.96	Onheiser, Mark	0.49	20.7	<1.0
NEW MARKET VOL FIRE CO	110-1146	RAW	FREDERICK	WET	0.55	7/14/02	7/16/02	1:30:00 PM	0.00	23.10	7.06	Onheiser, Mark	0.52	2.0	<1.0
NEW MARKET VOL FIRE CO	110-1146	RAW	FREDERICK	WET	0.55	7/14/02	7/17/02	1:25:00 PM	0.00	17.10	8.11	Onheiser, Mark	0.43	<1.0	<1.0
NEW MARKET VOL FIRE CO	110-1146	RAW	FREDERICK	WET	0.55	7/14/02	7/18/02	1:00:00 PM	0.00	12.40	8.18	Onheiser, Mark	0.53	<1.0	<1.0
DRY samples below	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Turbidity	Total Coliforms	E Coli Coliform
Aug-02															
PLEASANT GROVE U M CHURCH	110-1285	RAW	FREDERICK	WET	0.73	8/5/02	8/6/02	11:15:00 AM	0.00	14.02	7.06	Onheiser, Mark	1.47	8.7	1.0
PLEASANT GROVE U M CHURCH	110-1285	RAW	FREDERICK	WET	0.73	8/5/02	8/7/02	11:15:00 AM	0.00	12.40	8.11	Onheiser, Mark	1.43	19.2	1.0
PLEASANT GROVE U M CHURCH	110-1285	RAW	FREDERICK	WET	0.73	8/5/02	8/8/02	11:25:00 AM	0.00	16.20	7.04	Onheiser, Mark	0.84	13.7	1.0
PLEASANT GROVE U M CHURCH	110-1285	RAW	FREDERICK	WET	0.73	8/5/02	8/9/02	11:00:00 AM	0.00	13.80	7.01	Onheiser, Mark	1.57	7.5	<1.0

** Jon Upchurch.

BEC

To: Travis Sterner

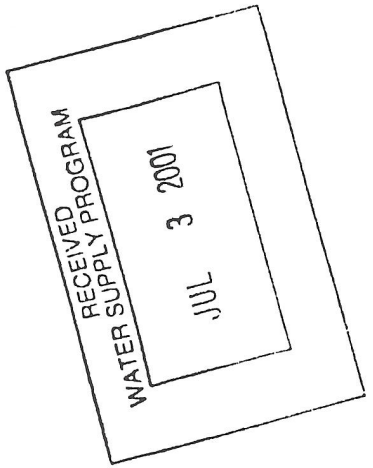
410.537.3157

GROUND WATER UNDER DIRECT INFLUENCE TESTING DATA

System Name: WILCOMS INN **PWSID:** 110-1210 **Source:** Drinking Water - RAW

Location of Rainfall Gauge: FREDERICK

	Event / Rainfall Information			Sampling and Field Test Information						Laboratory Results				
	Type of Event	Amt. of Precip.	Date of Precip.	Sampling		Cl2 Resid. (mg/L)	Temp. (C)	pH	Sampler	Turbidity (NTU's)	Total Coliforms(/ 1000ml)	E Coli Coliforms (/100ml)	Fecal Coliforms (/100ml)	Comments
				Date	Time									
1	DRY	0		6/19/01	1:00 PM	0.00	14.6	5.9	1672DM: Mathes, Dave	0.6	85	60		



GROUND WATER UNDER DIRECT INFLUENCE TESTING DATA

System Name: WILCOMS INN **PWSID:** 110-1210 **Source:** Drinking Water - RAW

Location of Rainfall Gauge: FREDERICK

	Event / Rainfall Information			Sampling and Field Test Information						Laboratory Results				
	Type of Event	Amt. of Precip.	Date of Precip.	Sampling		Cl2 Resid. (mg/L)	Temp. (C)	pH	Sampler	Turbidity (NTU's)	Total Coliforms(/ 1000ml)	E Coli Coliforms (/100ml)	Fecal Coliforms (/100ml)	Comments
				Date	Time									
1	DRY	0		6/19/01	1:00 PM	0.00	14.6	5.9	1672DM: Mathes, Dave	0.6	85	60		
2	DRY	0		7/19/01	2:00 PM	0.00	14.5	5.8	1672DM: Mathes, Dave	0.7	38	140		

GROUND WATER UNDER DIRECT INFLUENCE TESTING DATA

System Name: WILCOMS INN **PWSID:** 110-1210 **Source:** Drinking Water - RAW

Location of Rainfall Gauge: FREDERICK

	Event / Rainfall Information			Sampling and Field Test Information						Laboratory Results				
	Type of Event	Amt. of Precip.	Date of Precip.	Sampling Date	Sampling Time	Cl2 Resid. (mg/L)	Temp. (C)	pH	Sampler	Turbidity (NTU's)	Total Coliforms(/1000ml)	E Coli Coliforms (/100ml)	Fecal Coliforms (/100ml)	Comments
1	DRY	0		6/19/01	1:00 PM	0.00	14.6	5.9	1672DM: Mathes, Dave	0.6	85	60		
2	DRY	0		7/19/01	2:00 PM	0.00	14.5	5.8	1672DM: Mathes, Dave	0.7	38	140		
3	WET	1.25	5/27/02	5/28/02	2:30 PM	0.00	13.4	7	4621MO: Onheiser, Mark	4.74	>200.5	56		
4	WET	1.25	5/27/02	5/29/02	2:30 PM	0.00	13.5	6.6	4621MO: Onheiser, Mark	0.56	>200.5	4.2		
5	WET	1.25	5/27/02	5/30/02	2:15 PM	0.00	13.0	7.1	4621MO: Onheiser, Mark	0.42	200.5	<1.0		
6	WET	1.25	5/27/02	5/31/02	1:15 PM	0.00	12.5	6.1	4621MO: Onheiser, Mark	0.44	>200.5	1.0		

GROUND WATER UNDER DIRECT INFLUENCE TESTING DATA

System Name: MONOCACY CROSSING **PWSID:** 110-1150 **Source:** Drinking Water - RAW

Location of Rainfall Gauge: FREDERICK

	Event / Rainfall Information			Sampling and Field Test Information						Laboratory Results				
	Type of Event	Amt. of Precip.	Date of Precip.	Sampling		Cl2 Resid. (mg/L)	Temp. (C)	pH	Sampler	Turbidity (NTU's)	Total Coliforms(/ 1000ml)	E Coli Coliforms (/100ml)	Fecal Coliforms (/100ml)	Comments
				Date	Time									
1	DRY	0		6/20/01	2:00 PM	0.00	18.3	6.5	8129TH: Harrell, Tara	16.1	<1	<1		
2	DRY	0		7/20/01	3:00 PM	0.00	18.8	6.9	8129TH: Harrell, Tara	2.9	<1	<1		

GROUND WATER UNDER DIRECT INFLUENCE TESTING DATA

System Name: NEW MARKET GRANGE #362 **PWSID:** 110-1145 **Source:** Drinking Water - RAW

Location of Rainfall Gauge: FREDERICK

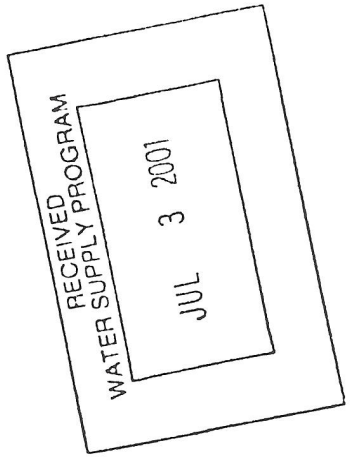
	Event / Rainfall Information			Sampling and Field Test Information						Laboratory Results				
	Type of Event	Amt. of Precip.	Date of Precip.	Sampling		Cl2 Resid. (mg/L)	Temp. (C)	pH	Sampler	Turbidity (NTU's)	Total Coliforms(/ 1000ml)	E Coli Coliforms (/100ml)	Fecal Coliforms (/100ml)	Comments
				Date	Time									
1	DRY	0		6/14/01	10:45 AM	0.00	15.5	6.8	8129TH: Harrell, Tara	0.4	13	<1		
2	DRY	0		7/17/01	11:35 AM	0.00	18.9	7	8129TH: Harrell, Tara	0.3	45	<1		

GROUND WATER UNDER DIRECT INFLUENCE TESTING DATA

System Name: NEW MARKET GRANGE #362 **PWSID:** 110-1145 **Source:** Drinking Water - RAW

Location of Rainfall Gauge: FREDERICK

	Event / Rainfall Information			Sampling and Field Test Information						Laboratory Results				
	Type of Event	Amt. of Precip.	Date of Precip.	Sampling		Cl2 Resid. (mg/L)	Temp. (C)	pH	Sampler	Turbidity (NTU's)	Total Coliforms(/ 1000ml)	E Coli Coliforms (/100ml)	Fecal Coliforms (/100ml)	Comments
				Date	Time									
1	DRY	0		6/14/01	10:45 AM	0.00	15.5	6.8	8129TH: Harrell, Tara	0.4	13	<1		



GROUND WATER UNDER DIRECT INFLUENCE TESTING DATA

System Name: GREEN VALLEY ANIMAL HOSPITAL **PWSID:** 110-1080 **Source:** Drinking Water - RAW

Location of Rainfall Gauge: FREDERICK

	Event / Rainfall Information			Sampling and Field Test Information						Laboratory Results				
	Type of Event	Amt. of Precip.	Date of Precip.	Sampling		Cl2 Resid. (mg/L)	Temp. (C)	pH	Sampler	Turbidity (NTU's)	Total Coliforms(/ 1000ml)	E Coli Coliforms (/100ml)	Fecal Coliforms (/100ml)	Comments
				Date	Time									
1	DRY	0		6/18/01	12:25 PM	0.00	14.7	7	1672DM: Mathes, Dave	0.4	<1	<1		
2	WET	0.75	7/8/01	7/9/01	2:45 PM	0.00	14.7	7.0	4436DS: Sensenig, Dustin	0.6	<1	<1		
3	WET	0.75	7/8/01	7/10/01	11:40 AM	0.00	15.8	6	4436DS: Sensenig, Dustin	0.4	<1	<1		
4	WET	0.75	7/8/01	7/11/01	10:50 AM	0.00	15.2	7.0	4436DS: Sensenig, Dustin	0.9	<1	<1		
5	WET	0.75	7/8/01	7/12/01	11:00 AM	0.00	15.6	7.1	4436DS: Sensenig, Dustin	0.5	1	<1		
6	DRY	0		7/18/01	12:07 PM	0.00	16.0	6.9	1672DM: Mathes, Dave	0.4	0	<1		

GROUND WATER UNDER DIRECT INFLUENCE TESTING DATA

System Name: WILCOM CONCESSIONS **PWSID:** 110-1002 **Source:** Drinking Water - RAW

Location of Rainfall Gauge: FREDERICK

	Event / Rainfall Information			Sampling and Field Test Information						Laboratory Results				
	Type of Event	Amt. of Precip.	Date of Precip.	Sampling		Cl2 Resid. (mg/L)	Temp. (C)	pH	Sampler	Turbidity (NTU's)	Total Coliforms(/ 1000ml)	E Coli Coliforms (/100ml)	Fecal Coliforms (/100ml)	Comments
				Date	Time									
1	DRY	0		6/19/01	10:00 AM	0.00	17.2	5.9	1672DM: Mathes, Dave	0.7	<1	<1		
2	WET	0.75	7/8/01	7/9/01	1:40 PM	0.00	21.6	6.1	4436DS: Sensenig, Dustin	0.6	100	<1		
3	WET	0.75	7/8/01	7/10/01	11:20 AM	0.00	20.3	6.3	4436DS: Sensenig, Dustin	1.2	38	<1		
4	WET	0.75	7/8/01	7/11/01	10:30 AM	0.00	20.6	6.3	4436DS: Sensenig, Dustin	0.9	48	<1		
5	WET	0.75	7/8/01	7/12/01	10:00 AM	0.00	19.6	6.3	4436DS: Sensenig, Dustin	0.8	30	<1		
6	DRY	0		7/19/01	10:00 AM	0.00	16.4	5.7	1672DM: Mathes, Dave	1.3	46	<1		

GROUND WATER UNDER DIRECT INFLUENCE TESTING DATA

System Name: WILCOM CONCESSIONS PWSID: 110-1002 Source: Drinking Water - RAW

Location of Rainfall Gauge: FREDERICK

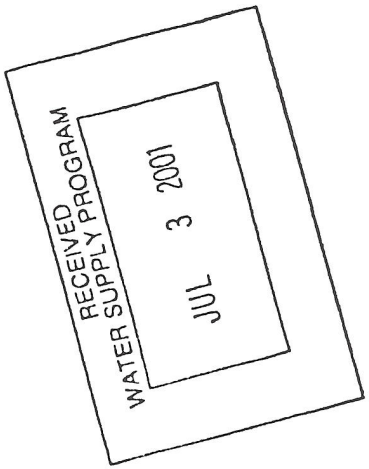
	Event / Rainfall Information			Sampling and Field Test Information						Laboratory Results				
	Type of Event	Amt. of Precip.	Date of Precip.	Sampling Date	Sampling Time	Cl2 Resid. (mg/L)	Temp. (C)	pH	Sampler	Turbidity (NTU's)	Total Coliforms(/ 1000ml)	E Coli Coliforms (/100ml)	Fecal Coliforms (/100ml)	Comments
1	DRY	0		6/19/01	10:00 AM	0.00	17.2	5.9	1672DM: Mathes, Dave	0.7	<1	<1		
2	WET	0.75	7/8/01	7/9/01	1:40 PM	0.00	21.6	6.1	4436DS: Sensenig, Dustin	0.6	100	<1		
3	WET	0.75	7/8/01	7/10/01	11:20 AM	0.00	20.3	6.3	4436DS: Sensenig, Dustin	1.2	38	<1		
4	WET	0.75	7/8/01	7/11/01	10:30 AM	0.00	20.6	6.3	4436DS: Sensenig, Dustin	0.9	48	<1		
5	WET	0.75	7/8/01	7/12/01	10:00 AM	0.00	19.6	6.3	4436DS: Sensenig, Dustin	0.8	30	<1		
6	DRY	0		7/19/01	10:00 AM	0.00	16.4	5.7	1672DM: Mathes, Dave	1.3	46	<1		
7	WET	1.37	8/12/01	8/13/01	12:10 PM	0.00	25.5	6	8129TH: Harrell, Tara	1.6	109.1	<1		
8	WET	1.37	8/12/01	8/15/01	12:15 PM	0.00	22.2	5.9	1672DM: Mathes, Dave	2.04	>200.5	<1.0		
9	WET	1.37	8/12/01	8/16/01	12:25 PM	21.10	21.1	6.7	1672DM: Mathes, Dave	0.49	>200.5	<1.0		
10	WET	1.37	8/12/01	8/17/01	11:41 AM	0.00	18.0	6.7	1672DM: Mathes, Dave	1.4	500	<1		

GROUND WATER UNDER DIRECT INFLUENCE TESTING DATA

System Name: WILCOM CONCESSIONS **PWSID:** 110-1002 **Source:** Drinking Water - RAW

Location of Rainfall Gauge: FREDERICK

	Event / Rainfall Information			Sampling and Field Test Information						Laboratory Results				
	Type of Event	Amt. of Precip.	Date of Precip.	Sampling		Cl2 Resid. (mg/L)	Temp. (C)	pH	Sampler	Turbidity (NTU's)	Total Coliforms(/ 1000ml)	E Coli Coliforms (/100ml)	Fecal Coliforms (/100ml)	Comments
				Date	Time									
1	DRY	0		6/19/01	10:00 AM	0.00	17.2	5.9	1672DM: Mathes, Dave	0.7	<1	<1		



TNC LIST - 2nd. Quarter (April, May, June)

PWSID	Facility	Date Sampled	Bacteria Results	Sampler	Violation Notices/Notes
101-001F	6-12 Gas Mart				
1101-095F	7-11 (Liberty)	6/29/00	Negative	MC G001	❶ Good H2O letter sent 7/13/00 for treated sample.
1101-090F	7-11 (Thurmont)	6/20/00	Negative	MC	❶ Good H2O letter sent 6/27/00.
1101-229F	Anna Prayer				
101-005F	Araby UMC				
1101-006F	Avalon	6/29/00	Negative (UV)	MC	❶ Good H2O letter sent 7/13/00 for treated sample.
1101-134F	Backyard Cafe	5/25/00	Negative (UV)	C.L. 135	
101-215F	Ballenger Com. Cen.	6/8/00 6/15/00	Positive (raw) Negative (4)	MC MC	❶ Good H2O letter sent 6/22/00.
101-009F	Barnes Store	6/21/00	Negative (CL)	K 102	
1101-011	Beckley's Camp Cen.	5/25/00	Negative (raw)	C.L.	
1101-012F	Beckley's Motel	5/25/00 5/25/00	Negative (raw) Negative (raw)	C.L. C.L.	
1101-150F	Blue Fox Inn/ Monocacy Crossing Rest.	4/27/00	Negative (raw)	C.L.	
101-282	Brookhill Preschool / UMC	6/21/00	Negative (UV)	K	
1101-020F	Brookside Inn	5/26/00 6/12/00	Postive (raw-surface & fecal Positive (4) - surface & fecal	FTL 116 FTL	❶Violation letter sent cert. 7/13/00

.101-035F	Catoctin Zoo	5/26/00 5/29/00	Positive (raw) Neg (3) Pos (1)	C.L. CL	❶ Violation letter sent 7/18/00 certified.
1101-258F	Ceresville Mansion	6/20/00	Negative	FTL	
1101-295F	Chapel Lutheran	6/21/00	Negative (raw)	CL	
1101-037F	Christian Brothers	6/8/00	Neg (cl)	MC	❶ Good H2O letter sent 6/16/00.
1101-038F	Church of God	6/21/00 7/6/00	Positive (total & E. Coli) Negative (4)	MC MC	❶ No chlorine detected in sample taken on 6/21/00. ❷ Good H2O letter sent 7/13/00.
101-216F	Clagett Diocesan	5/25/00	Negative (CL)	C.L.	❶ Nitrate & Nitrite 13.1.
101-252F	Clustered Spires	6/29/00 7/6/00	Negative (CL)-2 samples Positive (raw)-surface & fecal	MC MC	❶ Good H2O letter sent 7/13/00 for treated sample. ❷ Sanitary survey completed 7/6/00.
1101-040F	Corner Pub				
1101-259F	Cracked Claw	COMM. SUPPLY 6/21/00	Negative	K	❶ Deleted from TNC list as of 5/00. Will be monitored by MDE.
1101-230F	Crows Nest Lodge	7/7/00	Negative (CL)	CL	❶ Results & sample received late.
1101-049F	Dale's Place	5/25/00	Negative (raw)	C.L.	
.01-244F	Delauter & Sons	4/25/00	Negative	F.T.L.	
.01-018F	Delight Bakery	6/8/00 6/8/00	Negative (CL) Positive (raw)	MC MC	❶ Good H2O letter for treated sample 6/21/00.
1101-053F	Doubs UMC	6/26/00 6/28/00	Positive (raw) Positive (4)	CL CL	❶Violation letter sent cert.7/3/00.

101-231F	E-Z Fill Getty Stop	4/25/00	Negative (CL)	C.L.	
101-036F	Faith UC of Christ	6/20/00 6/26/00	Positive Positive (4)	MC MC	❶Violation letter sent cert. 7/3/00.
101-060F	Feaga's Market				
1101-062F	Flint Hill Gen. Store	5/31/00	Neg.(raw)	FTL	
1101-296F	Flint Hill UMC				
1101-253	Four County Exxon	6/12/00	Positive (raw)	K	
1101-066F	Franklin Liquors	5/31/00	Neg. (Raw)	FTL	
1101-067F	Frederick 4-H Camp	4/19/00	Negative (raw) & (CL)	MC	Sanitary Survey completed
1101-312F	FSK Exxon Community supply!				
1101-072F	Gabriel's	5/4/00 6/29/00	Negative (raw) Negative (raw)	K. K	❶ Results received late for 1st. Quarter. ❷
01-236	Gas Mart Inc.				❶ Well survey rec.5/8/00 ❷ Start montoring 2nd. Quarter
1101-074F	Gateway Inc.	6/9/00 6/12/00	Positive Positive (4)	CL CL	❶ Violation letter sent cert. 6/16/00. ❷
01-269F	Glade Valley Golf	6/29/00 7/6/00	Positive Negative (4)	MC MC	❷ Good H2O letter sent 7/13/00.
01-297	Grace Episcopal (New Market)	5/18/00	Negative (raw)	K.	
01-078F	Grace Trinity	6/14/00	Negative (raw)	K	

101-079	Graceham Moravian	6/26/00 6/28/00	Pos. (Raw) Pos. (4)	CL CL	❶Violation letter sent cert. 7/3/00.
101-080	Green Valley A.H.	5/2/00	Negative (Raw)	C.L.	
101-083	Grossnickle Church	5/19/00	Neg. (UV)	FTL	
101-298F	Hagan's Tavern	6/29/00	Negative	MC	❶ Good H2O letter sent 7/13/00 . ❷ Sanitary Survey completed 7/13/00.
101-086F	Hamilton's Lounge	6/28/00	Negative (UV)	CL	
101-087F	Harnes Market	5/26/00 6/9/00	Positive (raw) Positive (4)	FTL FTL	❶Violation letter sent cert. 7/
101-088F	Harriet's Chapel	5/25/00	Negative (UV)	C.L.	
101-263F	Harvest Val. Catering	5/24/00 7/13/00	Positive (raw) Neg. (4) (UV)	FTL FTL	❶ UV light installed in July.
101-096F	Hitching Post				
101-063F	Hoffman's Com. Sale	5/31/00 6/9/00	Positive (raw) Positive (4)	FTL FTL	❶Violation letter sent cert. 7/
101--097F	Holly Hills C.C.	5/11/00	Neg. (CL)	FTL	
101-103F	Ingram's Diner	6/14/00	Negative	K	
101-102F	Ingram's Shell	5/22/00	Neg. (Raw)	FTL	
101-106F	Jefferson Amoco	5/3/00	Neg. (Raw)	FTL	
101-109F	Jefferson Com. Cen.	4/26/00	Negative (raw)	MC	Sanitary Survey completed
101-107F	Jefferson Market	5/23/00 6/14/00	Negative (CL) Negative (Raw) Negative (CL)	MC MC K	❶ Good H2O letter sent 6/8/00. ❷ Sanitary Survey completed 5/23/00.
101-108	Jefferson Methodist	5/25/00 6/14/00	Negative (Raw) Negative (raw)	C.L. WTLM	

101-110F	Johnsville UMC				
101-112F	Kemptown Store	6/12/00	Negative (raw)	K	
101-117F	Lewistown UMC	5/25/00	Negative	C.L.	
101-118F	Lewistown VFD	5/25/00	Negative (CL)	C.L.	
1101-120F	Liberty Methodist	6/19/00	Negative (raw)	K	
1101-270F	**Liberty Rd. Seafood**				
1101-163	Libertytown S.C.	4/28/00	Negative (Acid net. H2O softner)	C.L.	
101-122F	Libertytown VFD	6/30/00	Negative (UV)	CL	
101-291F	Life in Jesus	5/25/00	Neg. (UV)	FTL	
1101-123	Lily Pons	6/20/00	Positive (raw) Negative (UV)	MC	❶ Good H2O letter sent 6/27/00.
101-124F	Linganore Grange	4/27/00	Negative (raw)	C.L.	
101-299F	**M&N Quick Stop**				
101-284F	Maple Run Golf Course	6/21/00	Negative (UV)	CL	
101-130F	Mar Lu Ridge (conf. Center) (Lodge)	6/19/00 6/19/00	Negative (raw, & CL) Negative (CL) Positive (raw)	MC MC	❶ Good H2O letter sent for lodge and conference center.
101-127F	Market Basket	5/25/00 5/26/00	Positive (Raw) Negative (4)	C.L. C.L.	

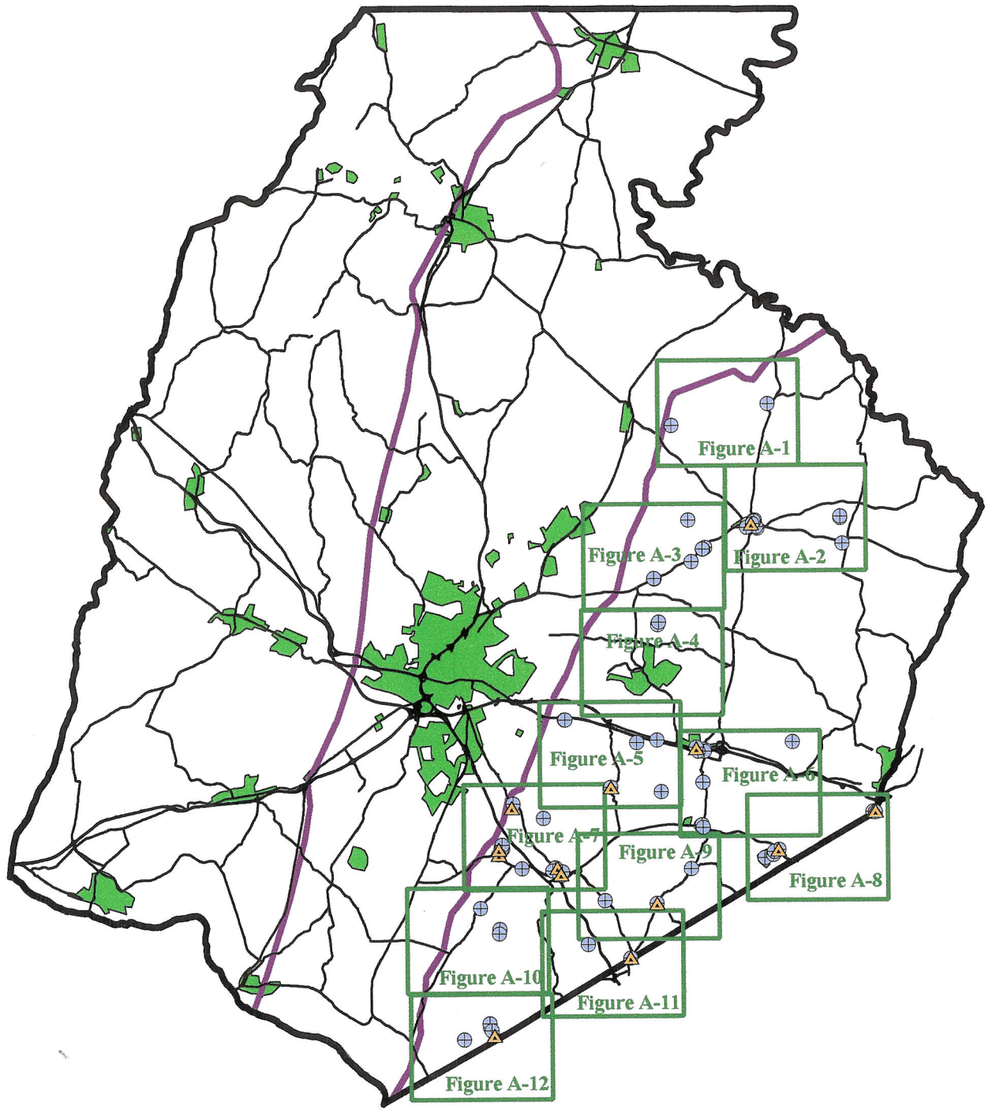
101-128F	Martin's Grocery	Not A TNC Supply!			❶ Deleted from TNC list.
1101-265F	McDonald's	5/25/00	Negative	C.L.	
101-233F	MD Sherrif's Ranch FR-73-7805 (Wright Bld.) FR-73-7375 (Viers cott.) FR-81-0021 (casey cott.)	 5/31/00 5/31/00 6/12/00 5/31/00	 Negative Positve Negative (4) Negative	 FTL FTL FTL	❶ Viers cottage chlorinator was not working at time of initial visit.
101-132F	Mealey's	5/2/00	Negative (CL)	C.L.	
101-272F	Mel's Airport Inn	5/25/00	Negatiave (Raw0	C.L.	
101-135F	Mills on the Hill				
101-273F	Morningside Inn	4/24/00 4/27/00 6/28/00	Positive (raw) Negative (4) Negative (raw)	K K K	❶ 1 st. Quarter results received late. (into 2nd. Quarter)
101-046F	Mt. Dale Conv.	6/6/00	Negative (raw) Nitrate 1.0 Nitrite <.005	FVA	
1101-138F	Mt. Dale General	5/25/00	Negative (UV)	C.L.	
101-140F	Mt. Carmel UMC	COMM. Supply			
101-142	Mt Pleasant Ruritan	6/6/00	Neg. (UV)	CL	
101-254F	New Market General	6/12/00	Neg. (Raw)	MC	❶ Good H2O letter sent for raw supply 6/21/00.
101-145F	New Market Grange				
101-146F	New Market VFD	5/2/00	Negative (softner)	C.L.	

101-147F	New Midway VFD	6/22/00	Negative (raw)	CL	
101-255F	Ole Mink Farm	5/8/00	Negative (UV) Positive (Raw)	M.C.	
101-285F	Pleasant Grove UMC	5/8/00 6/29/00	Negative (Raw) Negative (raw)	K. K	❶ 1st. Quarter results received late 5/8/00.
.101-149F	Produce Place	Not A TNC SUPPLY			❶ Facility deleted from TNC list & letter sent 6/8/00.
1101-155F	Providence UMC	7/11/00 7/12/00	Positive (1) Positive (4)	CL CL	❶ Violation letter sent 7/18/00 certified.
1101-305F	P.B.Dye Golf Course	6/7/00	Negative (raw)	FVA	
1101-105F	Rock's Place	6/14/00	Negative (raw)	K	
.01-159F	Rocky Hill Lutheran	6/22/00 6/27/00	Positive (1) Positive (3) E.coli Negative (1)	CL CL	❶ Violation letter sent 7/3/00 certified.
1101-160	Rocky Ridge FD				? I think building is unoccupied!
1101-161F	Rocky Ridge VFD	6/1/00	negative (raw)	CL	
1101-301F	Ross General Store				
1101-167F	Shamrock	6/9/00	Negative (raw)	CL	
.01-247F	Sheetz #176	5/25/00	Negative (UV)	C.L.	
1101-301F	Shell Oil - Mt. Airy				

101-171F	Skycroft	4/20/00 Well #1 Well #2 Well # 3	Negative (CL) Positive (raw) Negaitve (raw) Negative (raw)	MC MC MC MC	Sanitary Survey completed
1101-172	South Mtn. Camping	CLOSED			
1101-175F	St. Anthony's Shrine	COMM			❶ Deleted from TNC list.
1101-177F	St. John's Lutheran	6/26/00 6/28/00	Pos. (Raw) Pos. (4)	CL CL	❶Violation letter sent cert. 7/3/00. ❷ Public notice received 7/17/00.
1101-178F	St. John's UCC	6/12/00	Negative (CL)	CL	
.01-303F	St. Joseph's				
1101-085F	St. Lukes Hallowood	4/24/00	Negative (raw) & (treated)	MC	Sanitary Survey Completed
1101-179	St. Marks Church				
1101-180F	St. Marks Lutheran	5/31/00	Neg. (Raw)	FTL	
1101-182F	St. Pauls - Burkitts.	5/25/00	Negative (CL)	C.L.	
1101-304F	St. Pauls - Frederick	5/9/00	Negative (Raw)	K.	
1101-305F	St. Peters Parish (Center)	5/18/00	Negative (raw)	CL	

1101-305	St. Peters Parish (Old Church)	5/18/00	Negaive (raw)	CL	
1101-283	Stepping Stone D.C.	5/23/00 5/25/00 5/26/00	Negative Positive (raw) Negative (4)	MC C.L. C.L.	❶ Good H2O letter sent 6/16/00.
1101-306F	Stone Manor	6/28/00	Negative	K	
1101-274F	Stronghold Mansion	6/19/00 6/26/00	Positive (raw) Positve (UV) Postive(4)	MC MC	❶Violation letter sent cert. 7/3/00.
1101-183F	Summit Lake Camp	6/21/00	Negative (raw) Positive-treated Neg- treated	MC	
1101-307F	Sunset Supply				
1101-275F	Taneytown Rod/Gun	6/9/00	Negative (UV)	FVA 133	
1101-286	Tennis Barn	6/8/00	Negative (UV)	MC	❶ Facility does not have a raw tap. Letter needs to be sent.
1101-313F	Thorpewood	6/27/00	Negative (UV)	CL	
1101-194F	Thurmont Sports	6/27/00	Negative (CL) Nitrate-[illegible] Nitrite- 9.1	CL	
1101-196F	Toms Creek UMC	4/24/00	Negative (raw) & (UV)	MC	Sanitary Survey Completed
1101-197	Triangle Outdoor	5/11/00 5/25/00 6/21/00	Positive (raw) Pos. (4) fecal Neg.(UV)	K K K	❶ Letter sent cert. 5/26/00. ❷
1101-308F	Trout Liquors				
1101-192F	Turning Point Inn	5/31/00	Neg. (Raw)	FTL	

.101-309F	United Civic Assc.				
.101-310F	Urbana Conv. Shop (EXXON)	5/2/00 5/4/00	Positive (softner) Negitive (4)	C.L. C.L.	
1101-077F	Urbana Shop. Center (Ricks carryout/7-11)	5/31/00 6/6/00	Neg. Nitrates 11mg/l Nitrite ≤0.5mg/ Nitrate 9 mg/l	FTL FTL	❶ Total average nitrates = 10mg/l.
1101-202F	Urbana VFD	6/12/00	Neg. (UV) Neg. (Raw) -2	MC MC	❶ Good H2O letter for raw & treated sample 6/21/00.
1101-250F	VFW Post 3285	5/24/00	Neg. (UV)	FTL	
1101-204F	Village Tea Room	6/6/00 6/14/00	Positive Positive (4)	K K	❶ Violation letter 6/16/00 (cert.)
1101-207F	Wesley Chapel	5/31/00	Neg. (Raw)	FTL	
101-002F	Wilcom's Conc.	6/14/00	Neg (2 samples)	WTLM	
1101-210F	Wilcom's Inn	6/21/00	Negative (CL)	WTLM	
101-212	Wolfsville VFD	5/19/00 5/30/00 6/9/00	Positive (raw) Pos. (4) Neg. (4)	FTL FTL FTL	❶ Results received 6/30/00.
1101-311F	Worthington Manor	6/26/00	Negative (raw)	MC	❶ Good H2O letter sent 7/13/00 .
1101-213F	Yellow Spr. Lions	6/14/00	Negative (raw)	K	



Final Draft

N

EXPLANATION:

- Source Wellhead
- Potential Contamination Hazard
- Detailed Figure Extents (see Appendix A)
- Report Regions
- Active Sewer Service Areas
- Major Road

Scale:

25000 0 25000 50000 Feet

Notes:

1. Digital sewer service areas provided by MDE.
2. This figure is integral to a written report and should only be used in that context.
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Client:

The Maryland Department of the Environment

PROJECT NO. FR7S575

Project:

SOURCE WATER ASSESSMENT FOR GROUNDWATER SUPPLIES SERVING TRANSIENT NON-COMMUNITY SYSTEMS IN EASTERN FREDERICK COUNTY

Frederick County, Maryland

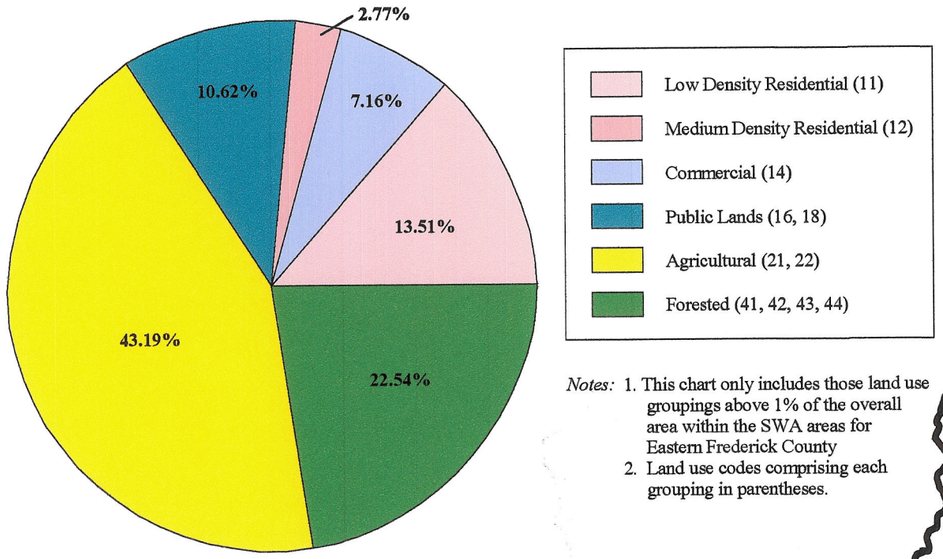
ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure 1:

Countywide Index of SWA Maps

March 10, 2005

Percentage of Overall Area by Land Use (Within SWA Areas)

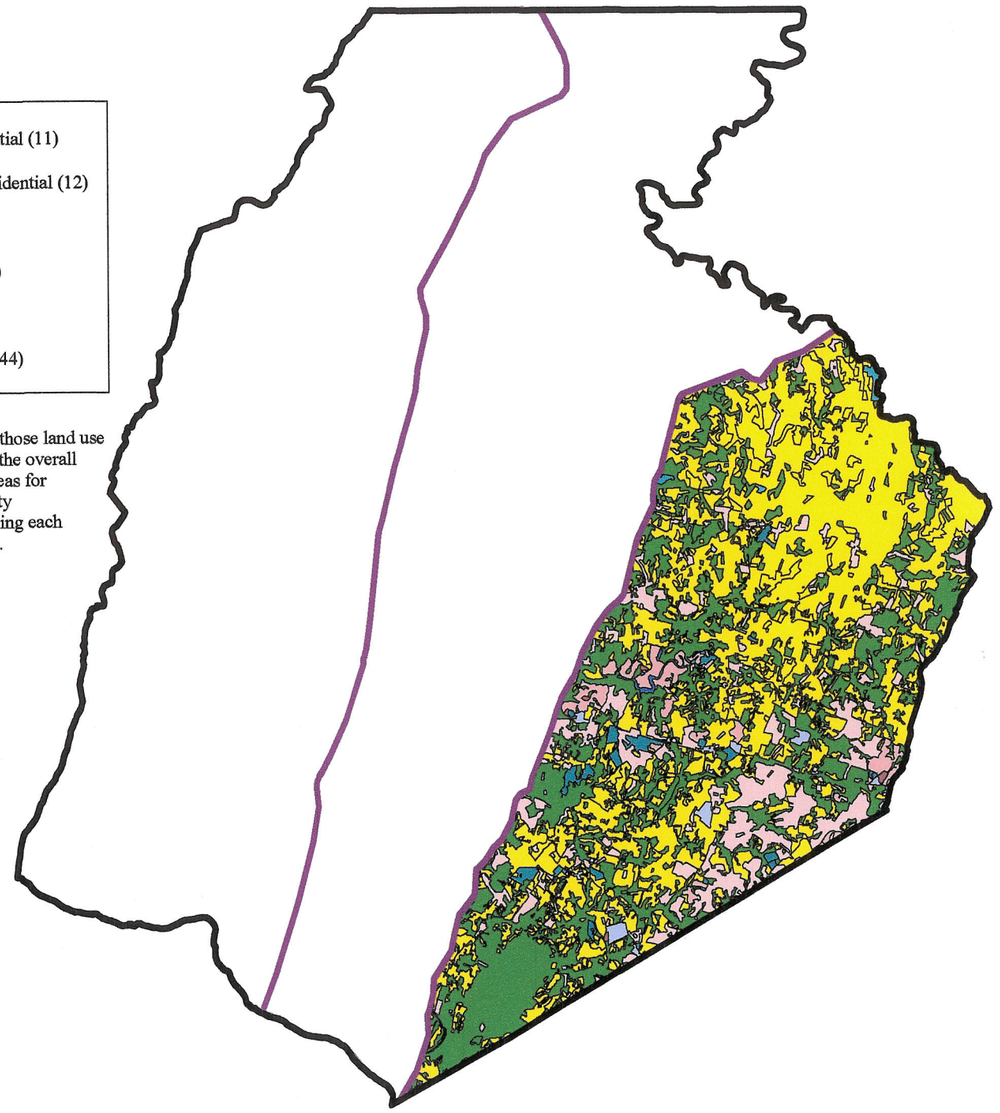


- Low Density Residential (11)
- Medium Density Residential (12)
- Commercial (14)
- Public Lands (16, 18)
- Agricultural (21, 22)
- Forested (41, 42, 43, 44)

Notes:
1. This chart only includes those land use groupings above 1% of the overall area within the SWA areas for Eastern Frederick County
2. Land use codes comprising each grouping in parentheses.

Detailed Breakdown by Land Use Code (Within SWA Areas)

Land Use Code	Land Use Description	Area (sq. meters)	Percentage of Total Area
11	Low-density residential	1,681,268	13.51
12	Medium-density residential	344,355	2.77
13	High-density residential	3,199	0.03
14	Commercial	891,431	7.16
16	Institutional	312,518	2.51
18	Open urban land	1,009,336	8.11
21	Cropland	4,611,561	37.05
22	Pasture	764,564	6.14
41	Deciduous forest	2,390,726	19.21
42	Evergreen forest	23,953	0.19
43	Mixed forest	235,800	1.89
44	Brush	155,539	1.25
50	Water	23,523	0.19



Final Draft

N

EXPLANATION:

Land Uses Within Eastern Frederick County:

Residential:
- Low-density Residential
- Medium-density Residential
- High-density Residential

Other:
- Water Body
- Public Lands
- Forested
- Commercial
- Agricultural
- Industrial
- Mined Lands
- Wetlands
- Bare Ground

Scale:

25000 0 25000 50000 Feet

Notes:
1. All land use data provided by the Maryland Department of the Environment (March 2004).
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Client:

The Maryland Department of the Environment

PROJECT NO. FR7S575

Project:

SOURCE WATER ASSESSMENT FOR GROUNDWATER SUPPLIES SERVING TRANSIENT NON-COMMUNITY SYSTEMS IN EASTERN FREDERICK COUNTY

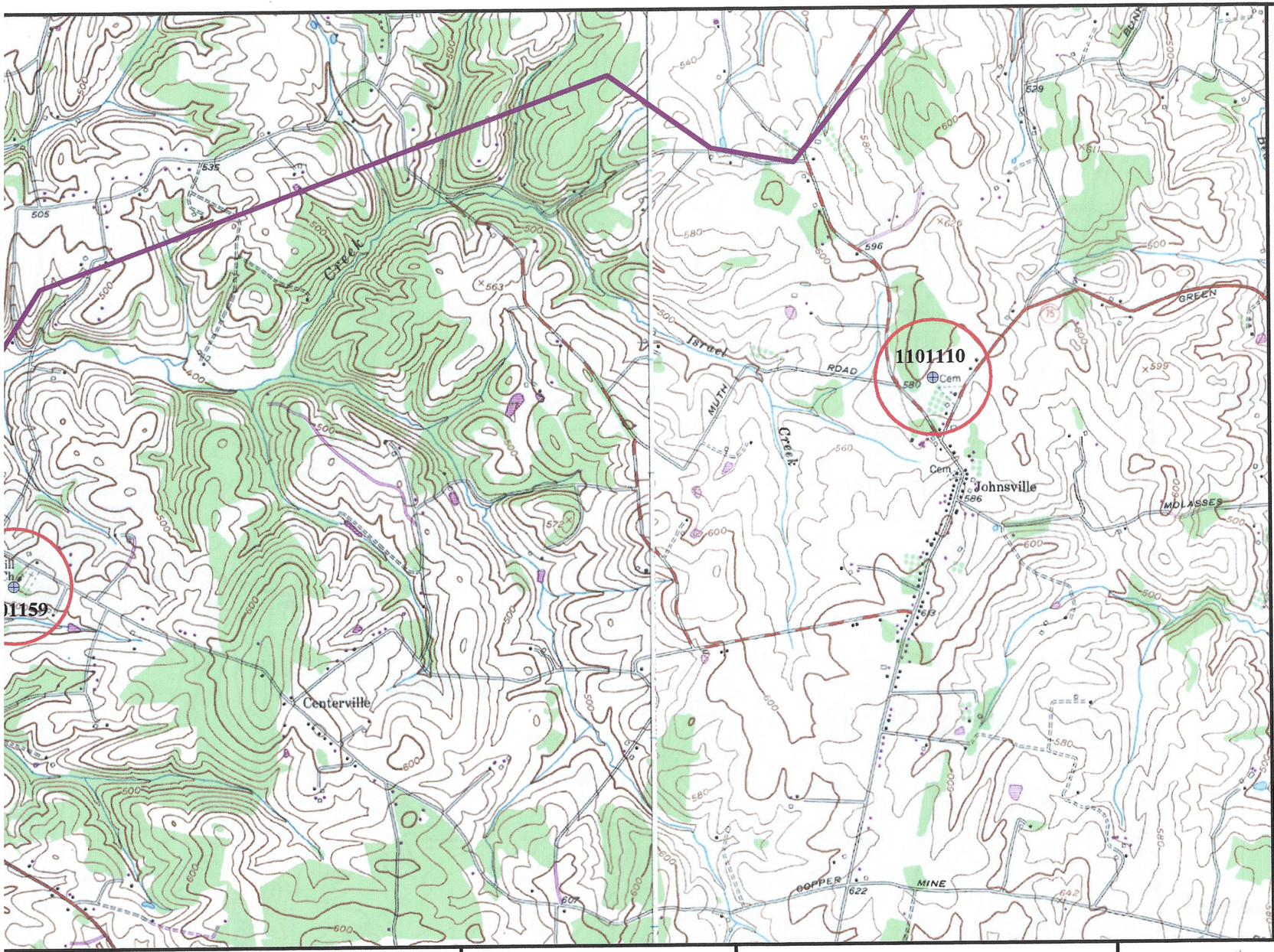
Frederick County, Maryland

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure 2:

Land Use Map

March 11, 2005



Final Draft

N

EXPLANATION:

- Source Wellhead
- Source Water Assessment Area (1,000 ft radius)
- Frederick Report Area Boundary

Subject Sources:

PWSID	Source Name
1101110	Johnsville UMC
1101159	Rocky Hill Lutheran Church

Scale:

2000 0 2000 4000 Feet

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Client:

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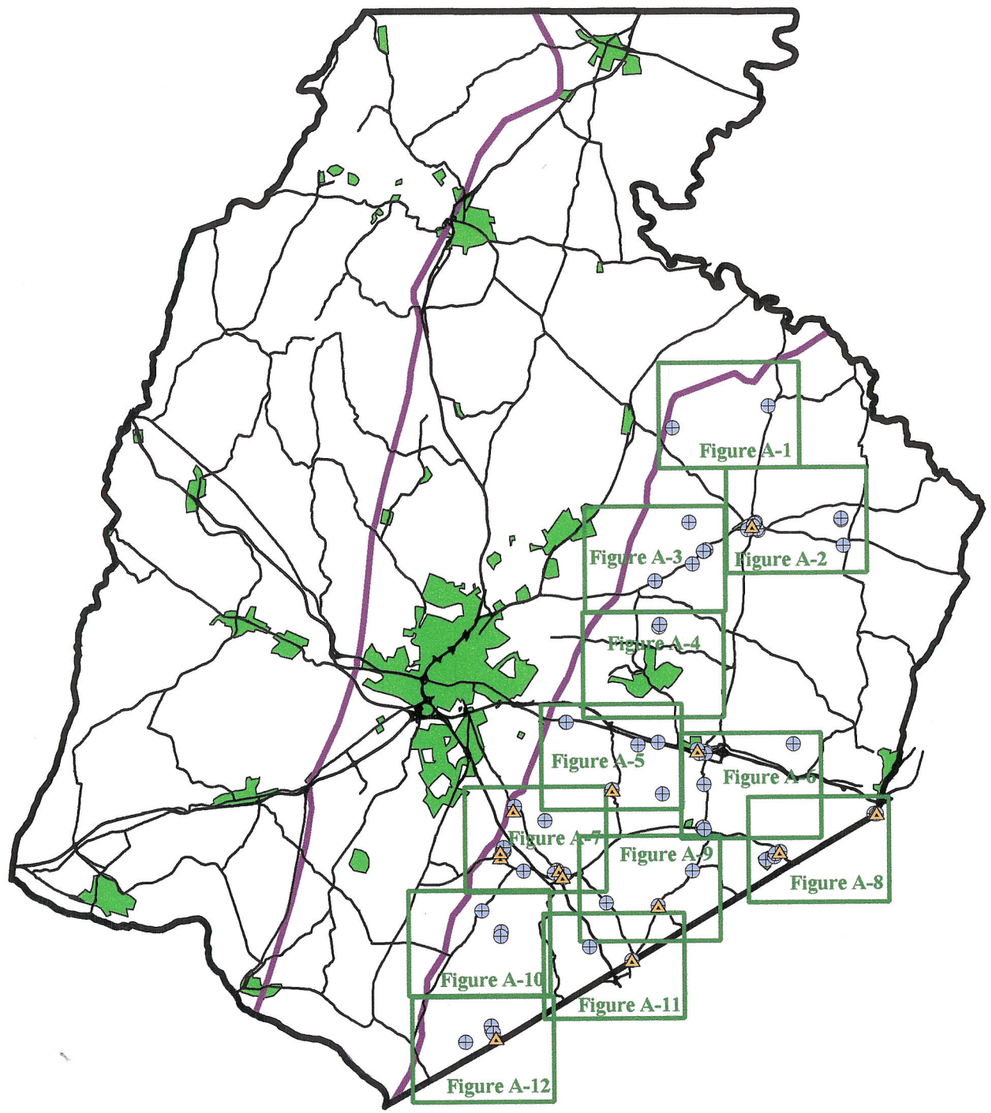
SOURCE WATER ASSESSMENT FOR GROUNDWATER SUPPLIES SERVING TRANSIENT NON-COMMUNITY SYSTEMS IN EASTERN FREDERICK COUNTY

Frederick County, Maryland

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure A-1:

February 7, 2005



Final Draft

N

EXPLANATION:

- Source Wellhead
- Potential Contamination Hazard
- Detailed Figure Extents (see Appendix A)
- Report Regions
- Active Sewer Service Areas
- Major Road

Scale:

25000 0 25000 50000 Feet

Notes:

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Client:

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Frederick County, Maryland

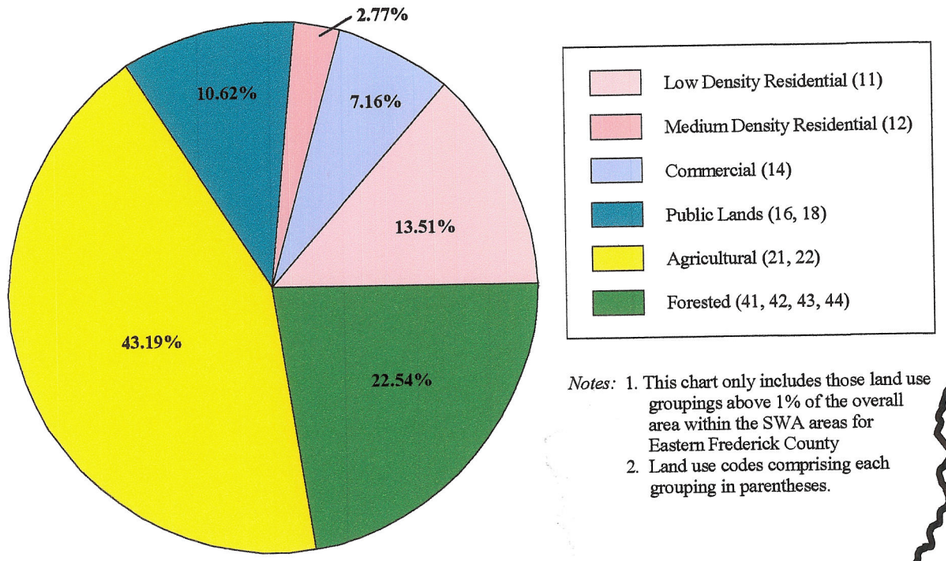
ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure 1:

Countywide Index of SWA Maps

March 10, 2005

Percentage of Overall Area by Land Use (Within SWA Areas)



- Low Density Residential (11)
- Medium Density Residential (12)
- Commercial (14)
- Public Lands (16, 18)
- Agricultural (21, 22)
- Forested (41, 42, 43, 44)

Notes:
1. This chart only includes those land use groupings above 1% of the overall area within the SWA areas for Eastern Frederick County
2. Land use codes comprising each grouping in parentheses.

Detailed Breakdown by Land Use Code (Within SWA Areas)

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18	Open urban land	1,009,336	8.11
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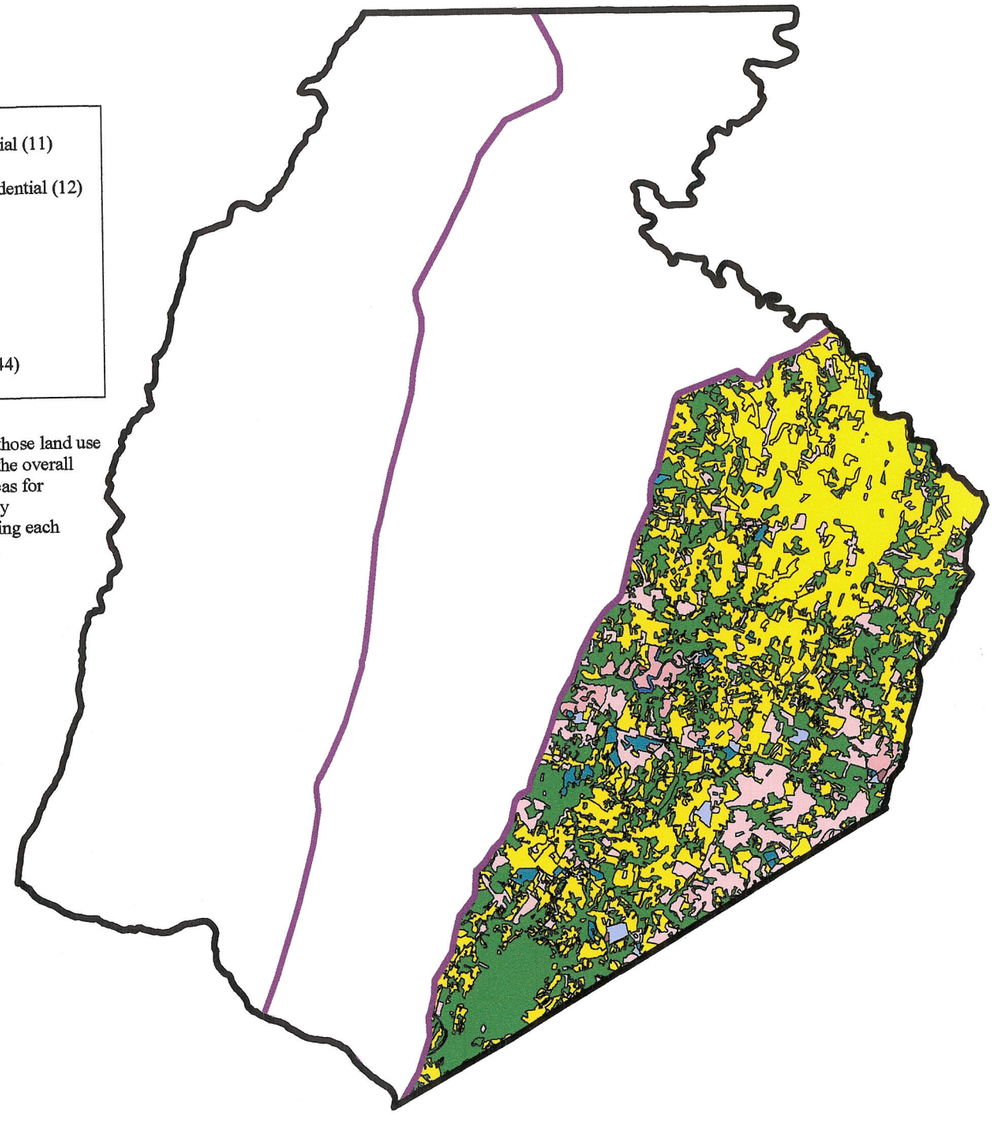

Final Draft

N

EXPLANATION:

Land Uses Within Eastern Frederick County:

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- Low-density Residential
- Medium-density Residential
- High-density Residential

Other:
- Water Body
- Public Lands
- Forested
- Commercial
- Agricultural
- Industrial
- Mined Lands
- Wetlands
- Bare Ground

Scale:

25000 0 25000 50000 Feet

Notes:
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SOURCE WATER ASSESSMENT FOR GROUNDWATER SUPPLIES SERVING TRANSIENT NON-COMMUNITY SYSTEMS IN EASTERN FREDERICK COUNTY

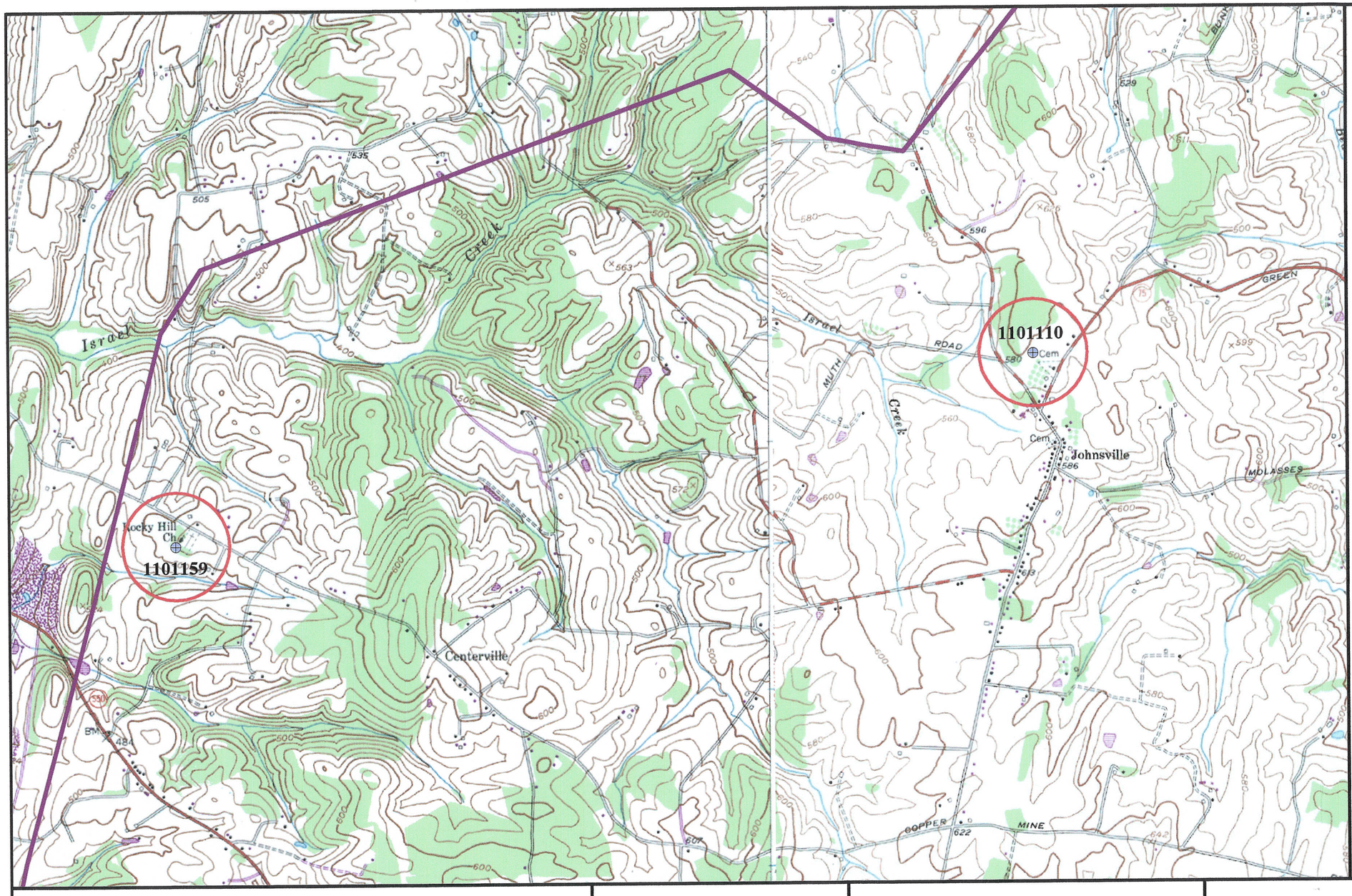
Frederick County, Maryland

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure 2:

Land Use Map

March 11, 2005



Final Draft

N

EXPLANATION:

- Source Wellhead
- Source Water Assessment Area (1,000 ft radius)
- Frederick Report Area Boundary

Subject Sources:

PWSID	Source Name
1101110	Johnsville UMC
1101159	Rocky Hill Lutheran Church

Scale:

2000 0 2000 4000 Feet

Notes:

1. Base map imported from digital USGS topographic quadrangle map for Woodsboro, MD (photorevised 1986) and Union Bridge (photorevised 1971); provided by MapTech, Inc.
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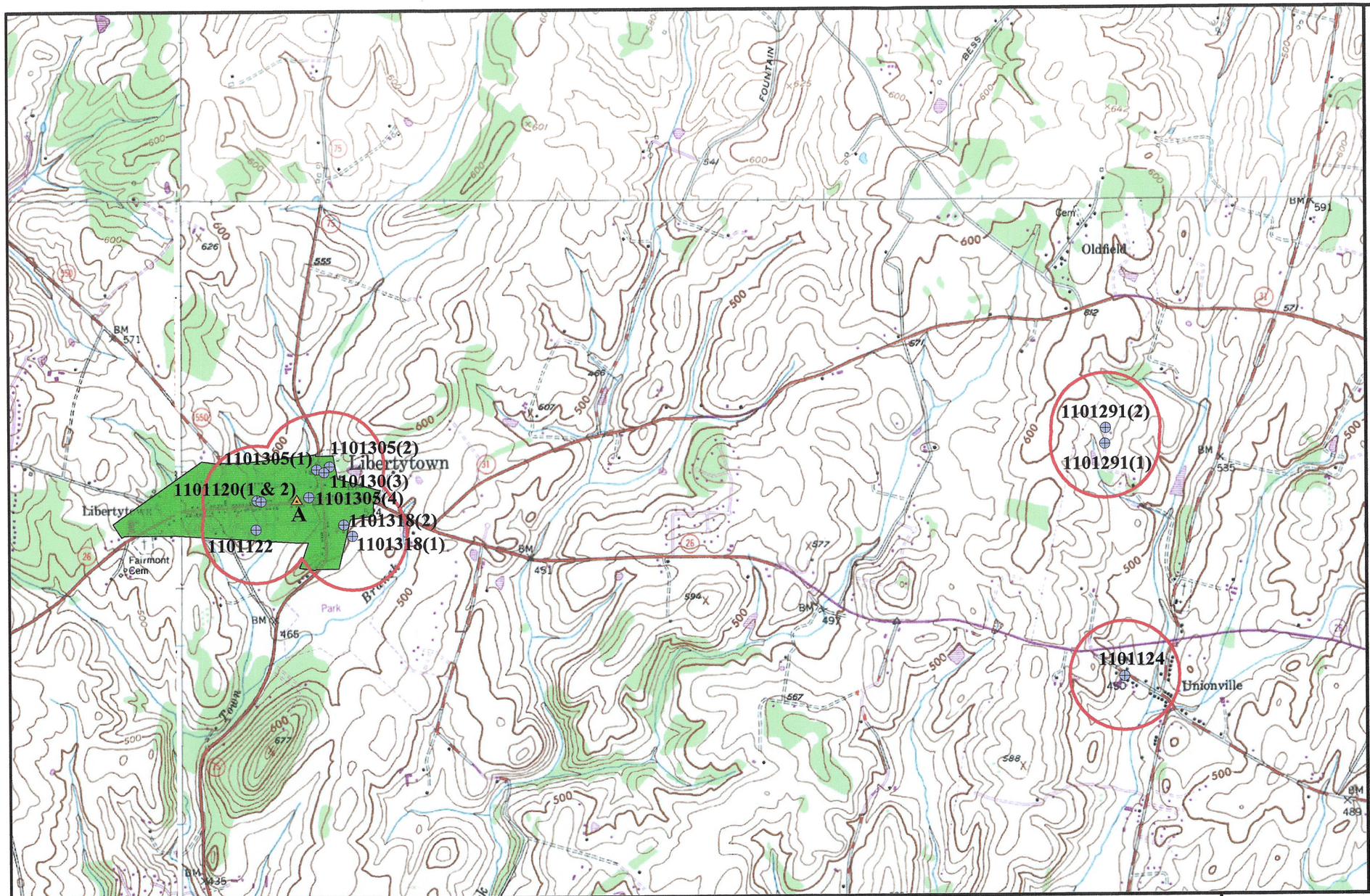
SOURCE WATER ASSESSMENT FOR GROUNDWATER SUPPLIES SERVING TRANSIENT NON-COMMUNITY SYSTEMS IN EASTERN FREDERICK COUNTY

Frederick County, Maryland

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure A-1:

February 7, 2005



Final Draft

N

EXPLANATION:

- Source Wellhead
- Potential Contamination Hazard
- Source Water Assessment Area (1,000 ft radius)
- Active Sewer Service Areas

Subject Sources:

PWSID	Source Name
1101120(1)	Liberty Methodist Church
1101120(2)	Liberty Methodist Church
1101122	Libertytown Vol. Fire Co.
1101124	Linganore Grange Hall
1101291(1)	Life in Jesus Berea House
1101291(2)	Life in Jesus Berea House
1101305(1)	St. Peter's Parish Center
1101305(2)	St. Peter's Parish Center
1101305(3)	St. Peter's Parish Center
1101305 (4)	St. Peter's Parish Center
1101318(1)	Libertytown Park
1101318(2)	Libertytown Park

Scale:

2000 0 2000 4000 Feet

Notes:

1. Base map imported from digital USGS topographic quadrangle maps for Libertytown and Walkersville, MD (photorevised 1993), Union Bridge, MD (photorevised 1971) and Woodsboro, MD (photorevised 1986); provided by MapTech, Inc.
2. This figure is integral to a written report and should only be used in that context.
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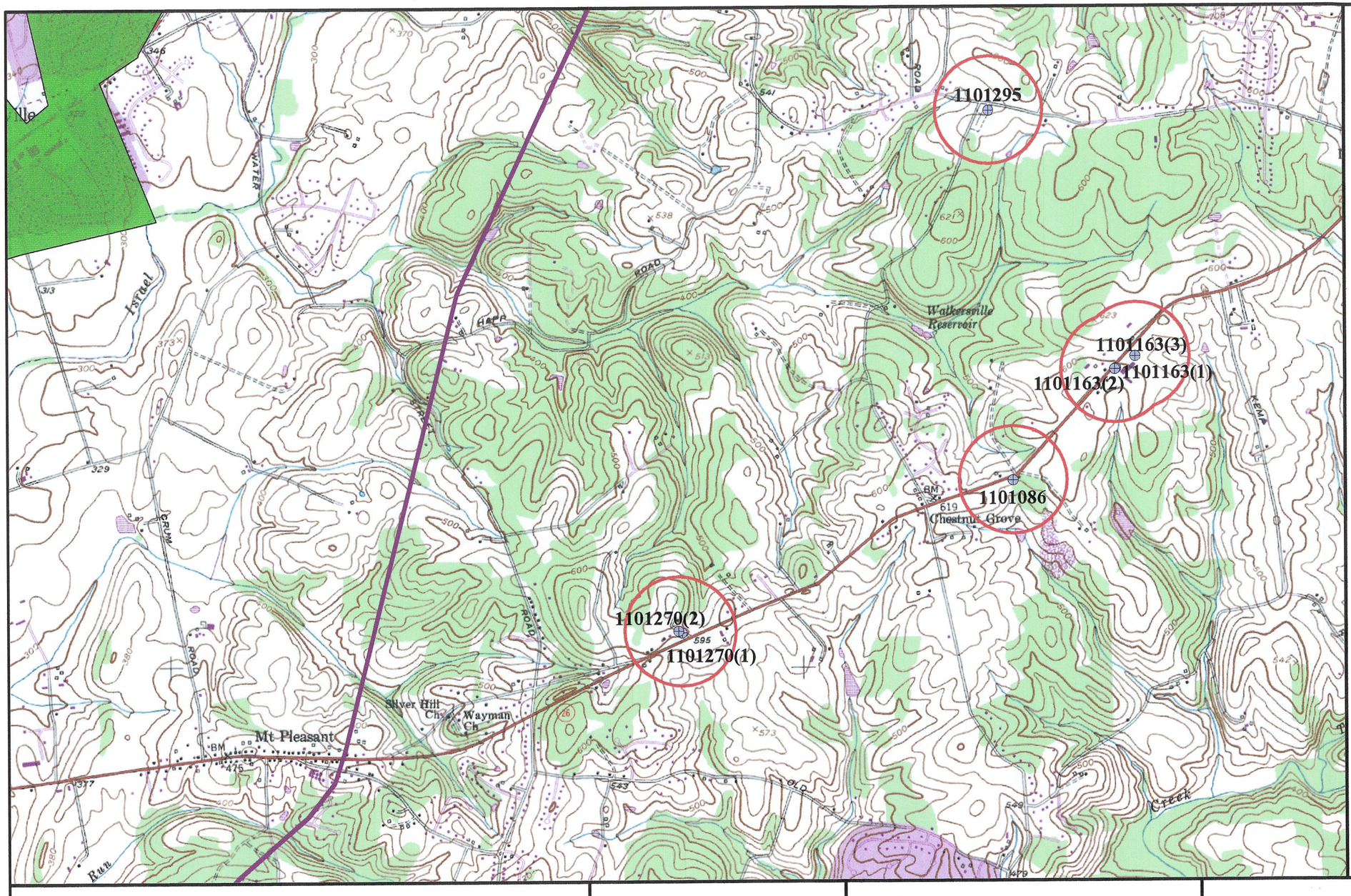
Frederick County, Maryland

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure A-2:

March 10, 2005



Final Draft

N

EXPLANATION:

- Source Wellhead
- Source Water Assessment Area (1,000 ft radius)
- Frederick Report Area Boundary
- Active Sewer Service Areas

Subject Sources:

PWSID	Source Name
1101086	Hamilton's Lounge
1101163(1)	Libertytown Shopping Center
1101163(2)	Libertytown Shopping Center
1101163(3)	Libertytown Shopping Center
1101270(1)	Liberty Road Seafood
1101270(2)	Liberty Road Seafood
1101295	Chapel Lutheran Church

Scale:

2000 0 2000 4000 Feet

Notes:

1. Base map imported from digital USGS topographic quadrangle maps for Walkersville, MD (photorevised 1993); provided by MapTech, Inc.
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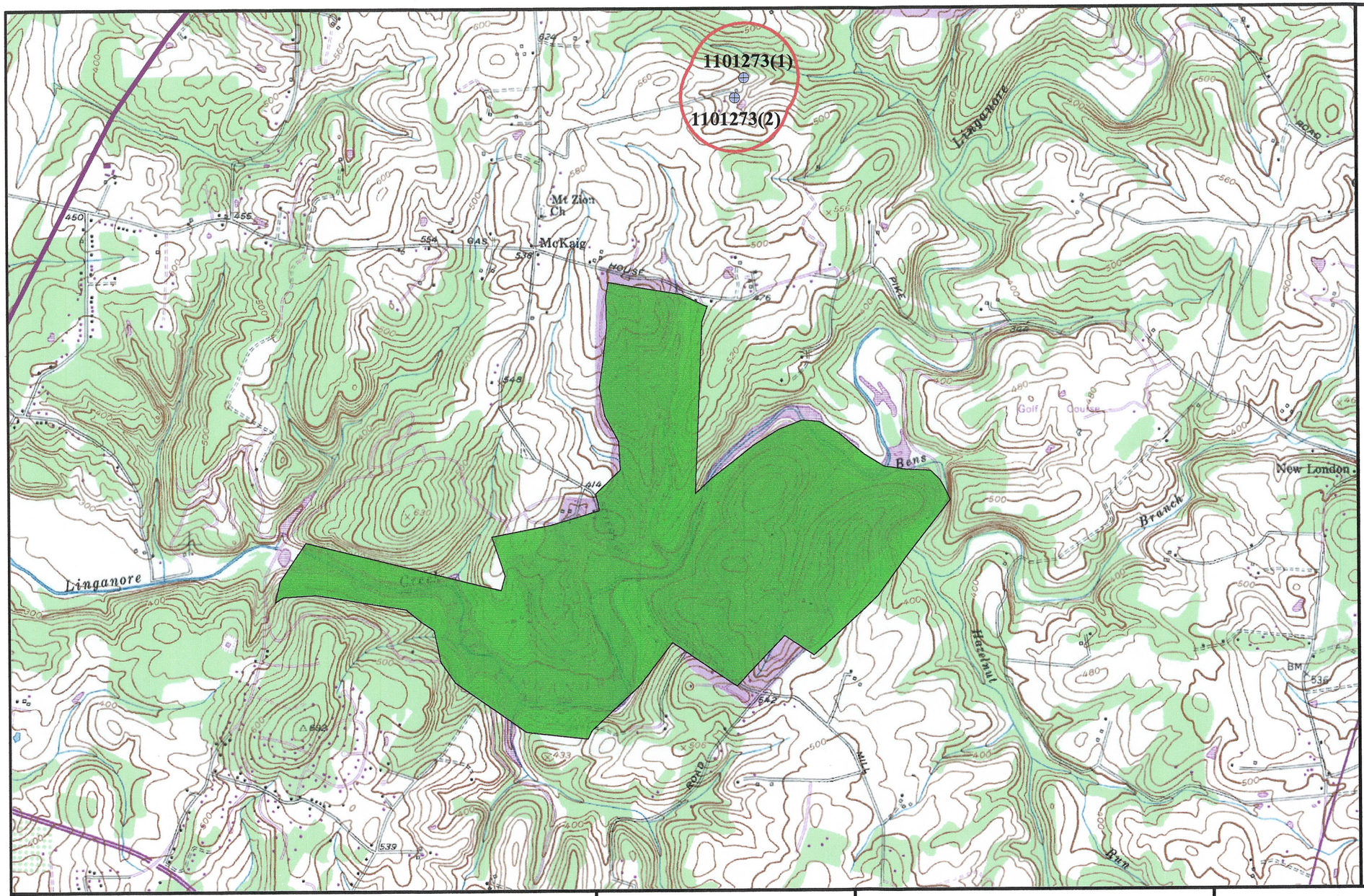
SOURCE WATER ASSESSMENT FOR GROUNDWATER SUPPLIES SERVING TRANSIENT NON-COMMUNITY SYSTEMS IN EASTERN FREDERICK COUNTY

Frederick County, Maryland

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure A-3:

February 7, 2005



Final Draft

N

EXPLANATION:

- Source Wellhead
- Source Water Assessment Area (1,000 ft radius)
- Active Sewer Service Areas

Subject Sources:

PWSID	Source Name
1101273(1)	Morningside Inn
1101273(2)	Morningside Inn

Scale:

2000 0 2000 4000 Feet

Notes:

1. Base map imported from the digital USGS topographic quadrangle map for Walkersville, MD (photorevised 1993); provided by MapTech, Inc.
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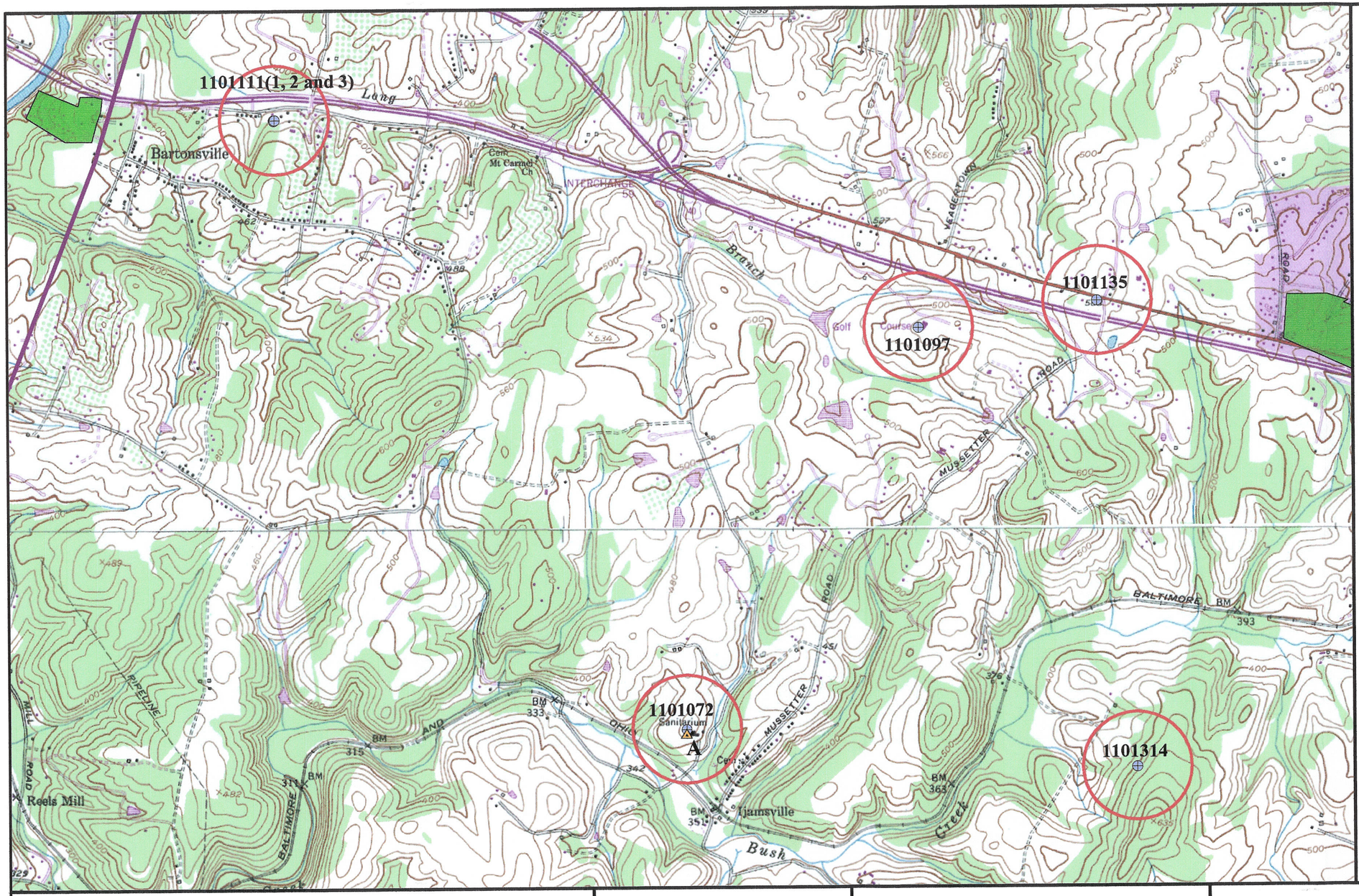
Frederick County, Maryland

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure A-4:

February 2, 2005



Final Draft

N

EXPLANATION:

- Source Wellhead
- Potential Contamination Hazard
- Source Water Assessment Area (1,000 ft radius)
- Frederick Report Area Boundary
- Active Sewer Service Areas

Subject Sources:

PWSID	Source Name
1101072	Gabriel's
1101097	Holly Hills Country Club
1101111(1)	Jug Bridge Seafood
1101111(2)	Jug Bridge Seafood
1101111(3)	Jug Bridge Seafood
1101135	Hilltop Convenience Store
1101314	Whiskey Creek Golf Course

Scale:

2000 0 2000 4000 Feet

Notes:

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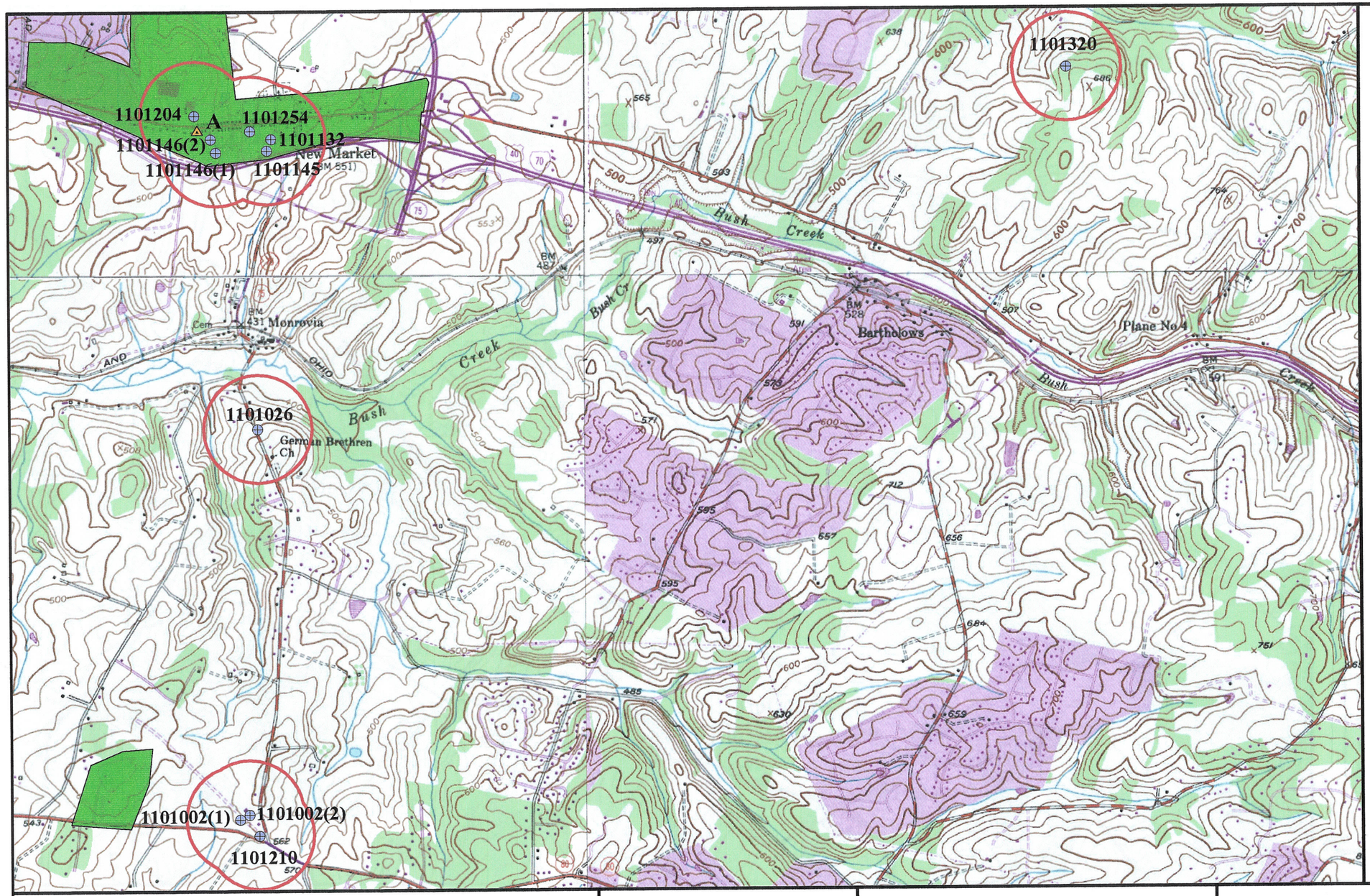
Frederick County, Maryland

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure A-5:

March 10, 2005



Final Draft

N

EXPLANATION:

- Source Wellhead
- Potential Contamination Hazard
- Source Water Assessment Area (1,000 ft radius)
- Active Sewer Service Areas

Subject Sources:

PWSID	Source Name
1101002(1)	Wilcom Concessions
1101002(2)	Wilcom Concessions
1101026	Bush Creek Church of the Brethren
1101132	Mealeys/New Market Hotel Corp.
1101145	New Market Grange #362
1101146(1)	New Market Vol. Fire Co.
1101146(2)	New Market Vol. Fire Co.
1101204	Village Tea Room
1101210	Wilcom's Inn
1101254	New Market General Store
1101320	Hope Valley Golf Course

Scale:

2000 0 2000 4000 Feet

Notes:

1. Base map imported from the digital USGS topographic quadrangle map for Walkersville, Libertytown, and Damascus, MD (photorevised 1993) and Urbana, MD (photorevised 1986); provided by MapTech, Inc.
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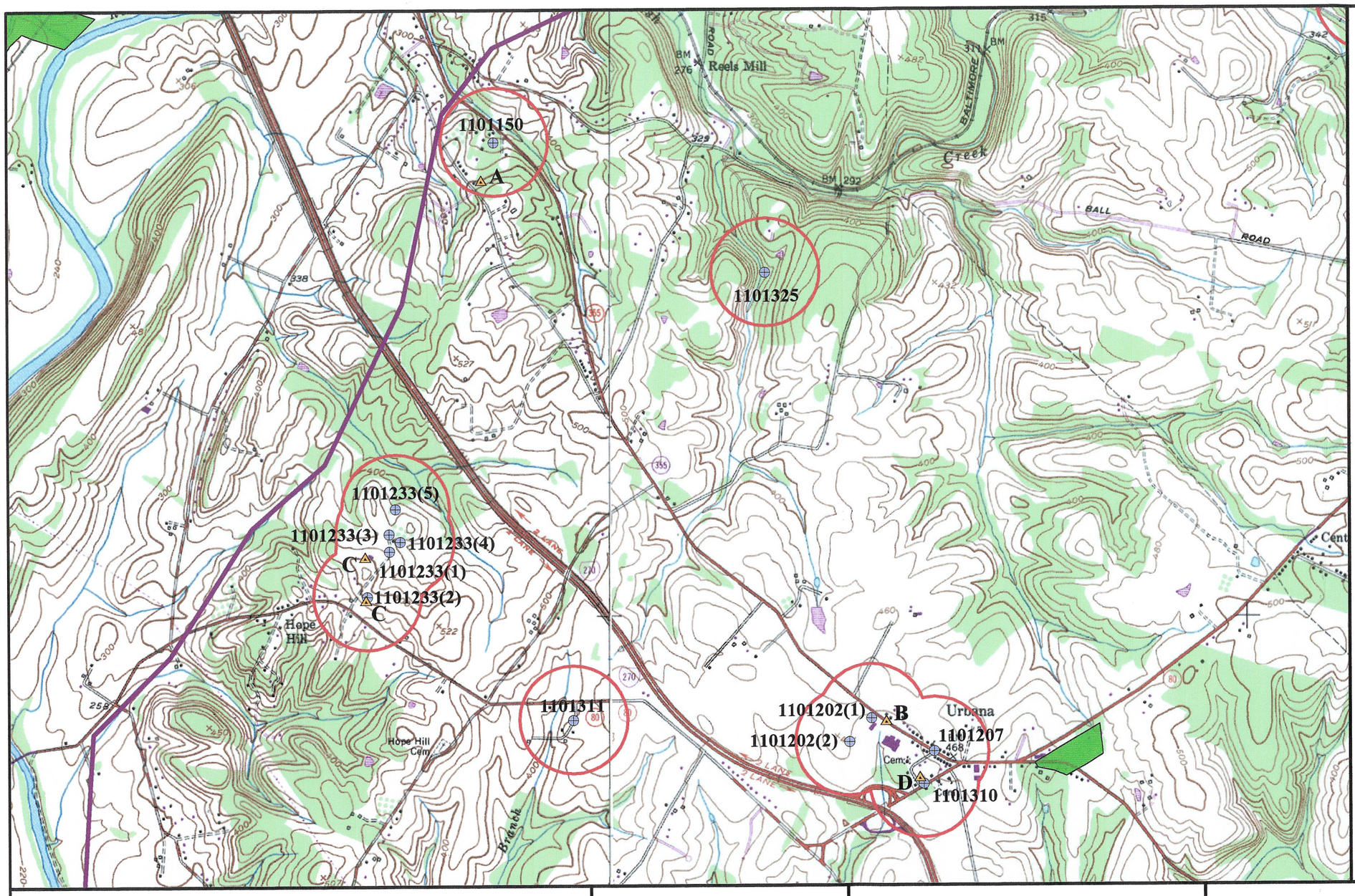
Frederick County, Maryland

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure A-6:

March 10, 2005



Final Draft

N

EXPLANATION:

- Source Wellhead
- Potential Contamination Hazard
- Source Water Assessment Area (1,000 ft radius)
- Frederick Report Area Boundary
- Active Sewer Service Areas

Subject Sources:

PWSID	Source Name
1101150	Monocacy Crossing
1101202(1)	Urbana VFD
1101202(2)	Urbana VFD
1101207	Wesley Chapel UMC
1101233(1)	MD Sheriffs Boys Ranch
1101233(2)	MD Sheriffs Boys Ranch
1101233(3)	MD Sheriffs Boys Ranch
1101233(4)	MD Sheriffs Boys Ranch
1101233(5)	MD Sheriffs Boys Ranch
1101310	Urbana Convenience Shop (Exxon)
1101311	Worthington Manor Golf Club
1101325	Camp Genstar

Scale:

2000 0 2000 4000 Feet

Notes:

1. Base map imported from the digital USGS topographic quadrangle map for Buckeystown, MD (photorevised 1984) and Urbana, MD (photorevised 1986); provided by MapTech, Inc.
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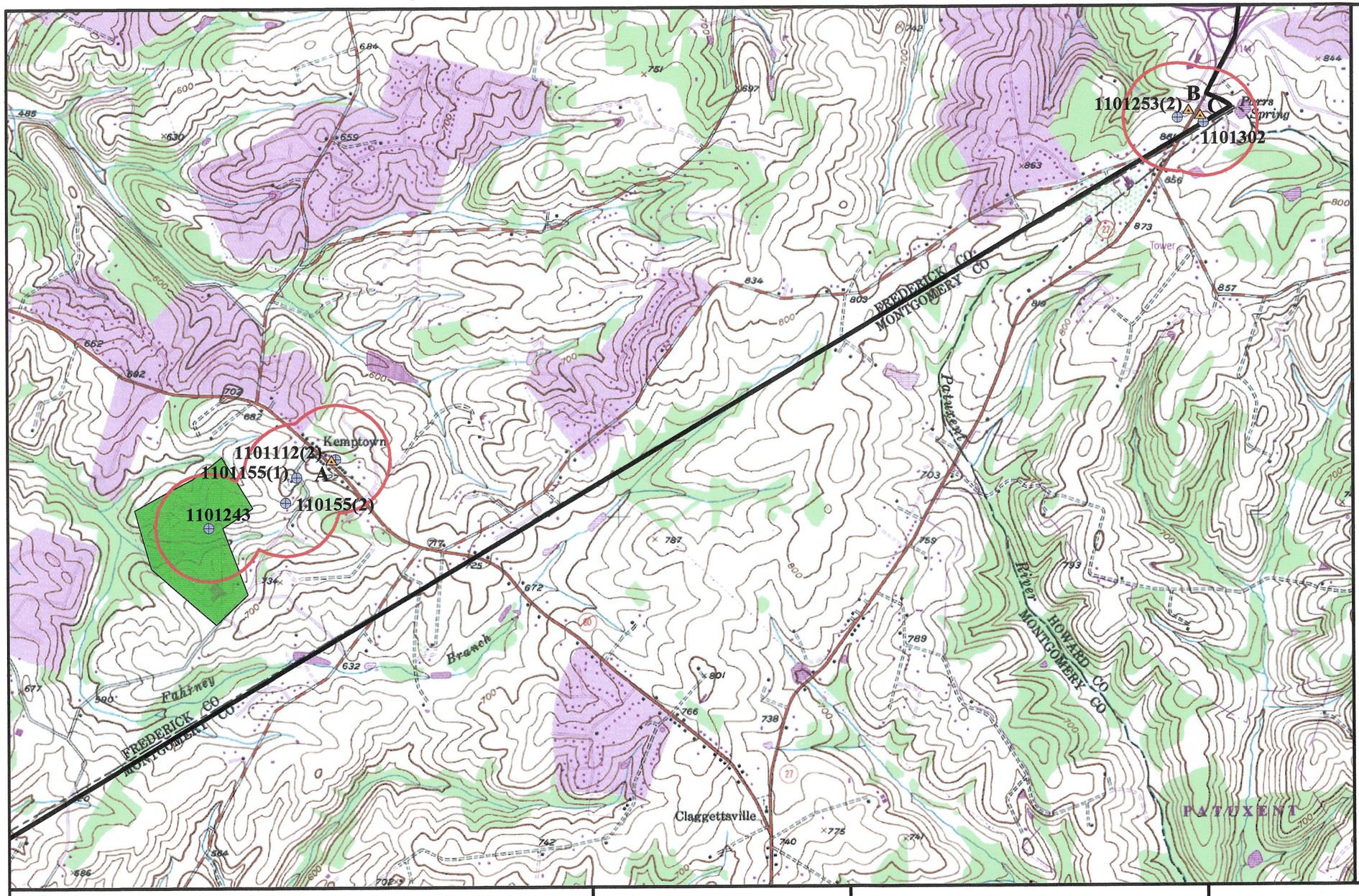
Frederick County, Maryland

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure A-7:

March 10, 2005



Final Draft

N

EXPLANATION:

- Source Wellhead
- Potential Contamination Hazard
- Source Water Assessment Area (1,000 ft radius)
- Frederick County Boundary
- Active Sewer Service Areas

Subject Sources:

PWSID	Source Name
1101112(2)	Kemptown Store
1101155(1)	Providence UMC
1101155(2)	Providence UMC
1101243	Kemptown Community Park
1101253(2)	Four County Exxon
1101302	Shell Oil Co.

Scale:

2000 0 2000 4000 Feet

Notes:

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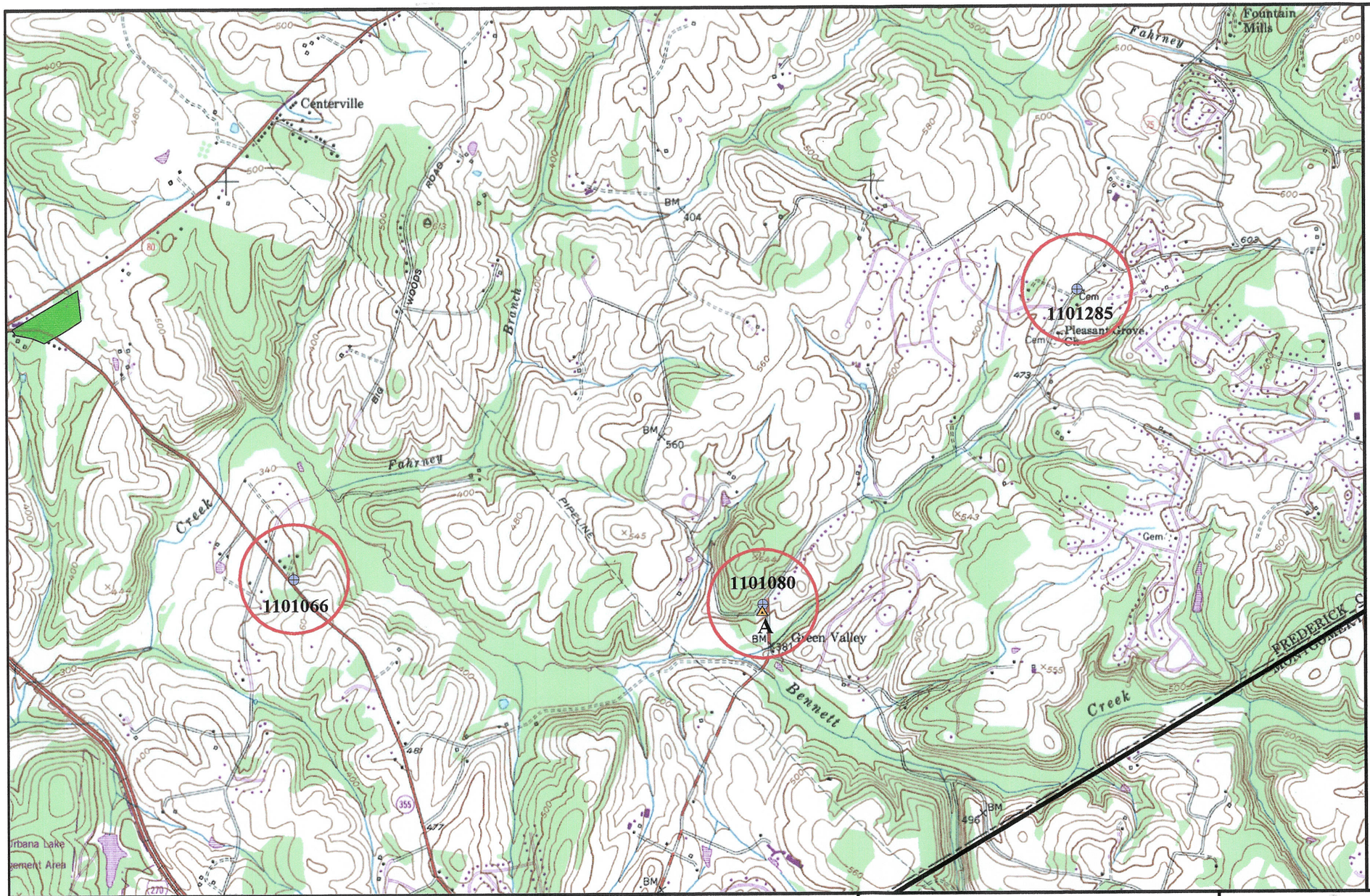
Frederick County, Maryland

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure A-8:

March 10, 2005



Final Draft

N

EXPLANATION:

- Source Wellhead
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- Source Water Assessment Area (1,000 ft radius)
- Frederick County Boundary
- Active Sewer Service Areas

Subject Sources:

PWSID	Source Name
1101066	Franklin Liquors
1101080	Green Valley Animal Hospital
1101285	Pleasant Grove UMC

Scale:

2000 0 2000 4000 Feet

Notes:

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PROJECT NO. FR7S575

Project:

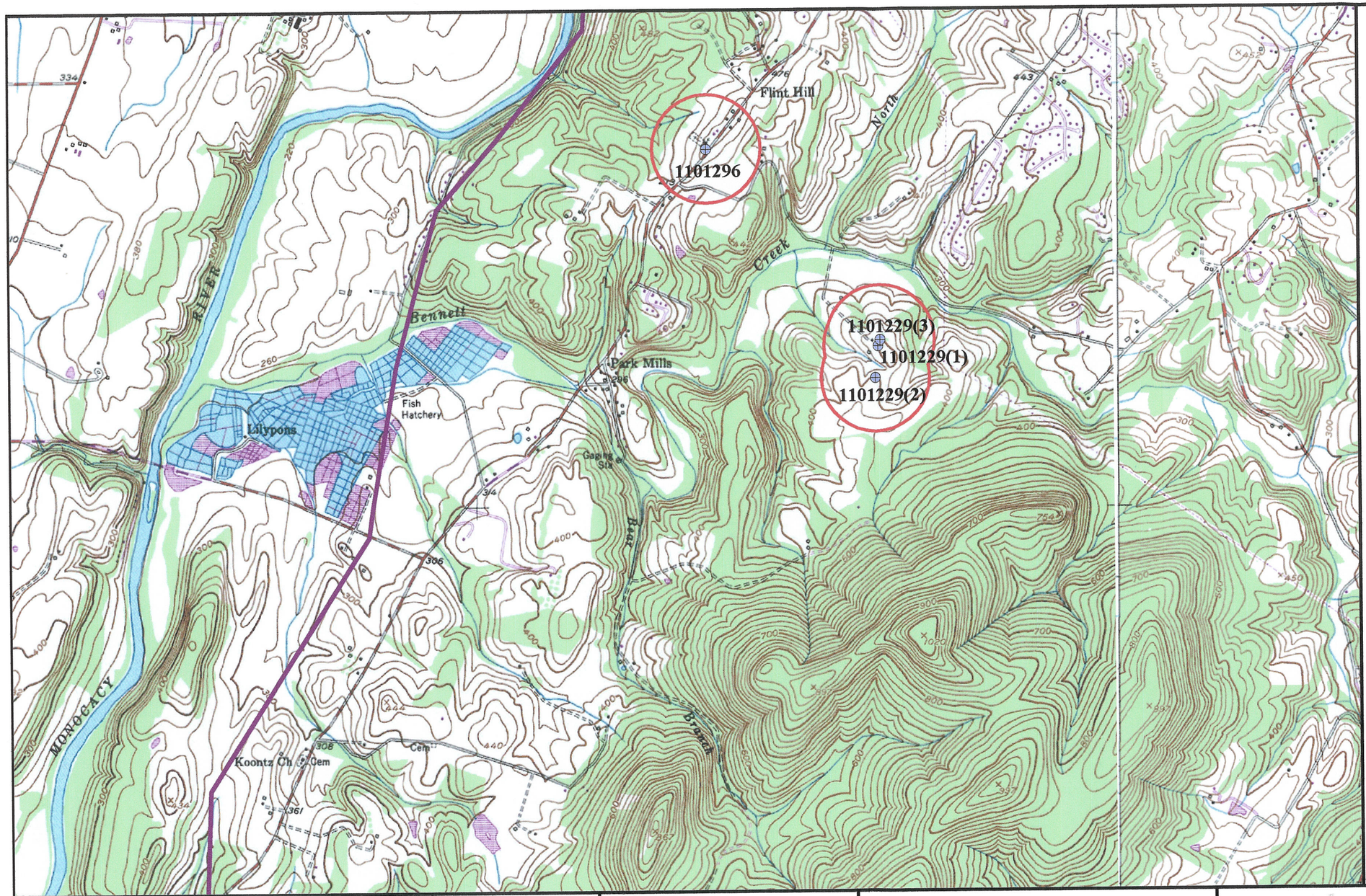
SOURCE WATER ASSESSMENT FOR GROUNDWATER SUPPLIES SERVING TRANSIENT NON-COMMUNITY SYSTEMS IN EASTERN FREDERICK COUNTY

Frederick County, Maryland

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure A-9:

March 10, 2005



Final Draft

N

EXPLANATION:

- Source Wellhead
- Frederick Report Area Boundary
- Source Water Assessment Area (1,000 ft radius)

Subject Sources:

PWSID	Source Name
1101229(1)	Anna Prayer
1101229(2)	Anna Prayer
1101229(3)	Anna Prayer
1101296	Flint Hill UMC

Scale:

2000 0 2000 4000 Feet

Notes:

1. Base map imported from digital USGS topographic quadrangle maps for Buckeystown, MD (photorevised 1984) and Urbana, MD (photorevised 1986); provided by MapTech, Inc.
2. This figure is integral to a written report and should only be used in that context.
3. This figure is not intended to be used for boundary verification or survey control purposes.

Client:

The Maryland Department of the Environment

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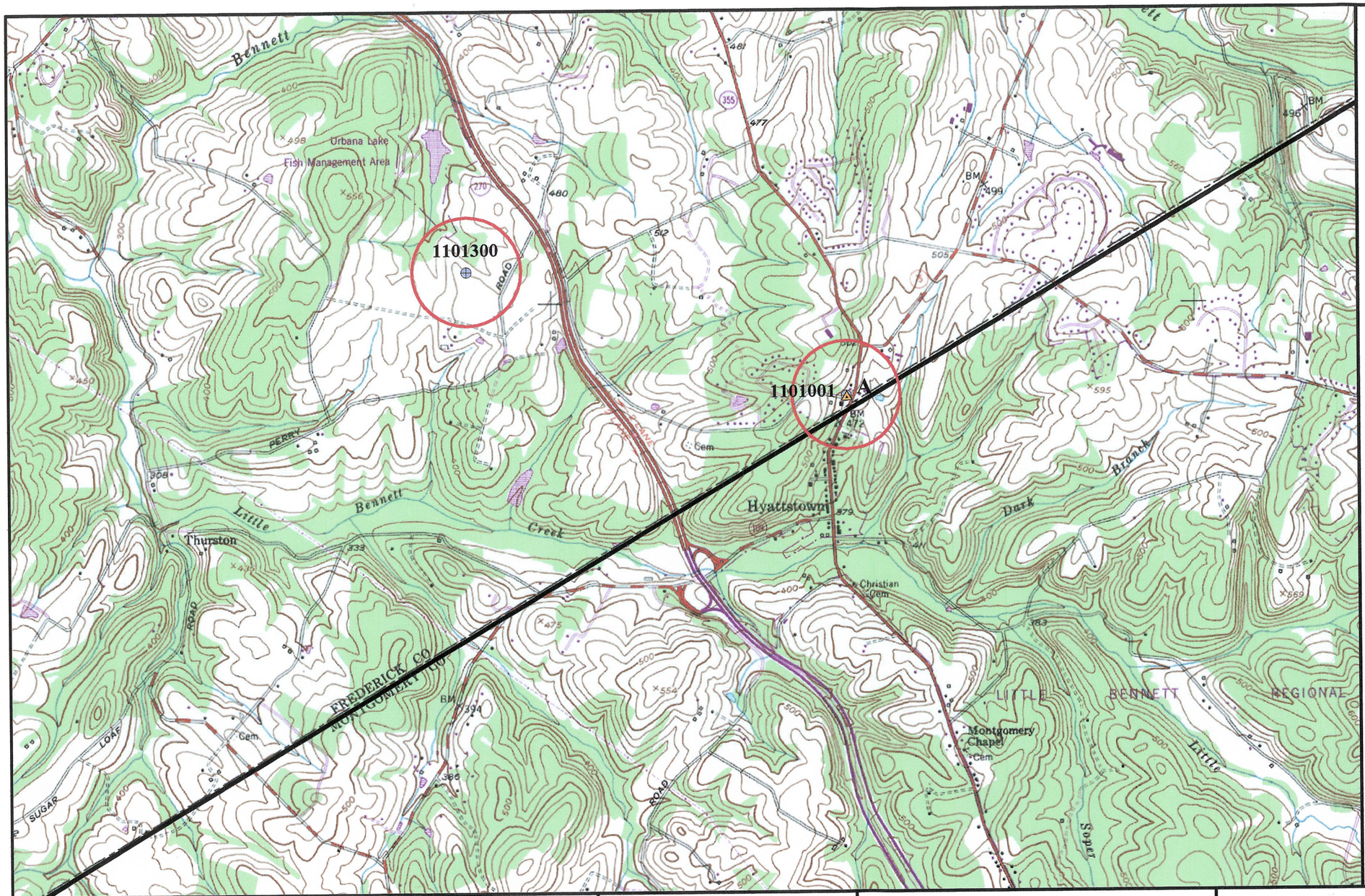
Frederick County, Maryland

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure A-10:

February 2, 2005



Final Draft

N

EXPLANATION:

- Source Wellhead
- Potential Contamination Hazard
- Source Water Assessment Area (1,000 ft radius)
- Frederick County Boundary

Subject Sources:

PWSID	Source Name
1101001	6-10 Gas Mart
1101300	PB Dye Golf Club

Scale:

2000 0 2000 4000 Feet

Notes:

1. Base map imported from digital USGS topographic quadrangle maps for Urbana, MD (photorevised 1986); provided by MapTech, Inc.
2. This figure is integral to a written report and should only be used in that context.
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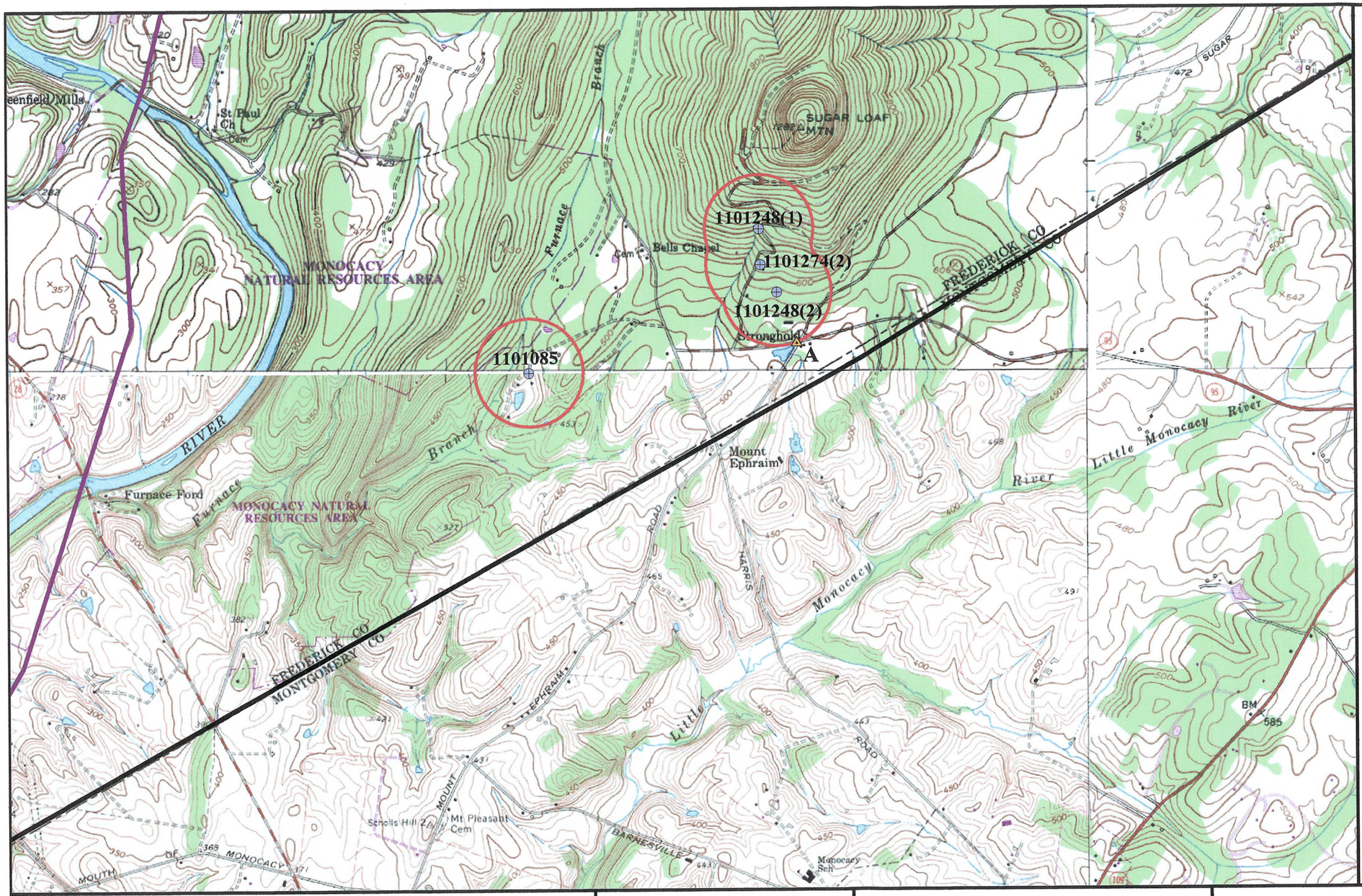
ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure A-11:

March 10, 2005



N

Final Draft

EXPLANATION:

- Source Wellhead
- Potential Contamination Hazard
- Source Water Assessment Area (1,000 ft radius)
- Frederick Report Area Boundary
- Frederick County Boundary

Subject Sources:

PWSID	Source Name
1101085	St. Luke Hallowood Retreat Center
1101248(1)	Sugarloaf Mountain Park
1101248(2)	Sugarloaf Mountain Park
1101274(2)	Stronghold Mansion

Scale:

2000 0 2000 4000 Feet

Notes:

1. Base map imported from digital USGS topographic quadrangle maps for Buckeystown, MD (photorevised 1984), Poolesville, MD (photorevised, 1978), Germantown, MD (photorevised 1979) and Urbana, MD (photorevised 1986); provided by MapTech, Inc.
2. This figure is integral to a written report and should only be used in that context.
3. This figure is not intended to be used for boundary verification or survey control purposes.

Client:

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Frederick County, Maryland

ADVANCED Land and Water, Inc. — Global Environmental Solutions

Figure A-12:

March 10, 2005