

**WELLHEAD AREA SURVEY
TRI-TOWN PLAZA
ACHD SITE NOS. 5, 9, 15, 19, and 99
Allegany County, Maryland**

ALWI Project No. AL7N001

1.0 INTRODUCTION

Advanced Land and Water, Inc. (ALWI) was retained by the Allegany County Health Department (ACHD) to prepare a combined Wellhead Survey Area for Tri-Town Plaza (the plaza). The plaza is located on the north side of Westernport Road, and immediately north of the Potomac River, in southwestern Allegany County, Maryland. ALWI evaluated and sampled five separate though closely spaced well water supplies at the Plaza, as follows:

ACHD Site No.	Locally Used Name	Well Tag No.	Disinfection Mode
5	Sav-A-Lot	No tag visible	UV Light
9	Mac's Restaurant	No tag visible	Chlorination
15	Moran Liquors	No tag visible	UV Light
19	Tri-Town Cinemas	No tag visible	Chlorination
99	Tri-Town Plaza	AL-81-0284	Chlorination

Each well penetrates the local bedrock aquifer as "open hole completion." The wells are not interconnected, though from time to time temporary water lines have been used between buildings and businesses to address short-term needs and deficiencies. The present status of these cross-connections is unknown.

The draft Maryland Department of the Environment (MDE) "Transient Water Systems Operations Guidance" manual (herein termed the "Guidance Manual") defines a Non-Transient Non-Community (NTNC) Water System as one that "...serves at least 25 regular consumers over 6 months per year." ALWI obtained limited usage data by interviewing the on-site manager, summarized as follows:

ACHD Site No.	Typical No. Days/Year Used	Typical Population During Usage Period	System Status
5	140	10	TNC
9	45	15	TNC
15	45	50	TNC
19	Unknown	Unknown	TNC
99	Unknown (new)	Unknown (new)	TNC

In general, the infrequent and occasional use of the wells suggest that they are appropriately designated transient non-community systems (TNCs).

1.1 PURPOSE

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 the 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 a statewide Wellhead Protection Program developed by MDE in June 1991.

The MDE program originally applied to community water supplies, only. A newly proposed broadening of the federal Clean Water Act will have the result of expanding the MDE Wellhead Protection Program to encompass non-community supplies both transient and non-transient in nature. ACHD, in cooperation with MDE, established this program to bring existing non-community supplies into compliance with the coming regulations.

1.2 SCOPE

ALWI prepared this Wellhead Survey Area following ACHD requirements, which followed MDE guidelines for transient system operation and wellhead protection.

1. **Site Reconnaissance, Photographic Documentation and Interviews** – ALWI observed the on-site wellhead, storage, treatment, and distribution infrastructure to the degree exposed without excavation or exposure to personal hazards. ALWI used an ACHD-owned digital camera to photograph conditions surrounding each wellhead at the time of the field reconnaissance. Said photographs are stored on ACHD's computer system. ALWI interviewed various on-site personnel to document information on the use patterns, history and problems associated with the supplies.
2. **Baseline Water Quality Assessment** - ALWI purged the water system and collected samples for analysis in the ACHD laboratory that is affiliated with the Maryland Department of Health and Mental Hygiene (DHMH). ALWI performed this fieldwork in accordance with MDE potable water sampling criteria including in-field measurements of turbidity, chlorine, and pH. ACHD selected the analyte list based on countywide experience with potability concerns and the capabilities of the aforementioned laboratory. The analytes included total and fecal coliform bacteria, nitrates, nitrites, iron, sulfur and manganese (Appendix B).
3. **Contamination Hazard Assessment** – ALWI identified existing and potential contaminant hazards within the delineated surveyed area based on visual observations and the techniques enumerated above. ALWI ranked these hazards in term of relative risk and provided concrete suggestions for their appropriate address. More generally, herein ALWI provides

recommendations for source reduction measures, contingency plans, and other methods that may better protect against occurrences of groundwater contamination.

2.0 HYDROGEOLOGIC FRAMEWORK

ALWI used published information from the United States Geological Survey and the Maryland Geological Survey to identify and describe the characteristics of the local hydrogeologic setting.

2.1 BEDROCK GEOLOGY

The Plaza is situated within the Appalachian Plateau physiographic province and is underlain by sedimentary rocks of late Mississippian age. The Mauch Chunk formation underlies the site and consists of red and green shales and lesser amounts of sandstone (Cleaves, 1968). These rocks have been gently folded, resulting in broad synclines (concave-upward folds) and anticlines (convex-upward folds).

In three dimensions, the local rock formations dip at right angles to the direction of plunge of the fold system. In general, dip directions may help govern groundwater (and contaminant) movement directions in the bedrock but plunge directions have less relation. However, at this location, the bedding planes are nearly horizontal, which suggests that the gentle southwesterly structural plunge may exert greater-than-usual control on deep groundwater flow directions.

Reported well yields within the Mauch Chunk formation are sparse but range from 5 to 24 gpm. Wells completed within sandstone layers generally have a higher yield because the greater competence of the rock allows the development of longer and wider fractures both along and across bedding planes.

2.2 SAPROLITE AND SOIL MANTLE

Natural chemical weathering of the shallow portion of the bedrock, due to percolating water, has chemically altered many of the original rock-forming minerals to clays and other secondary minerals. This has resulted in the development of shallow saprolite (weathered bedrock) and the overlying soil mantle. The thickness of the soil and saprolite is generally 2 to 10 feet, but it varies considerably over short distances. In highly fractured zones, enhanced groundwater storage and movement has accelerated the breakdown of the rock-forming minerals and has caused formation of a thicker saprolitic deposit.

2.3 AQUIFER RECHARGE

Precipitation infiltrating through the soil on site and/or in topographically up-gradient areas is the primary source of aquifer recharge to the on-site supply wells. Generally, overlying soil horizons act to absorb and then slowly release infiltrating precipitation. However, in areas where fracture zones have formed, percolating groundwater can reach the water table quickly. A portion of the

precipitation percolates downward through the soil mantle and then migrates through narrow, interconnected joints, fractures, faults, and cleavage planes in the bedrock.

2.4 GEOLOGY-CONTROLLED GROUNDWATER FLOW

Generally, bedding plane partings and cross-bedding fracture zones (where present) function as both downward and lateral water conduits. Consequently, such zones receive and transmit water at a rate higher than would otherwise be achievable and, accordingly, are preferential conduits for groundwater flow and contaminant transport.

Despite the bedrock's overall hardness and resistance to erosion, hydraulic permeabilities in bedding planes and fracture zones within the Mauch Chunk Formation may be several times greater than in surrounding less-fractured rock. This intrinsic characteristic portends the possibility for the existence of specific zones with higher-than-normal (1) well yields, (2) groundwater flow velocities, and (3) susceptibility to groundwater contamination.

3.0 WATER QUALITY ASSESSMENT

Slaughter and Darling (1962) reported the groundwater quality from the Mauch Chunk Formation as locally variable (iron concentrations range from 0.0 to 0.2 micrograms per liter (mg/l); hardness ranges from 60 to 86 mg/l; and pH averages 7.0). ALWI interpreted that the slight reddish colors of the local rock exposures as likely attributable to the trace presence of iron.

At this location, ALWI collected baseline groundwater samples on December 28, 1998, in accordance with the MDE sampling procedures specified in COMAR 26.08.05. Both pre- and post treatment samples were collected from two of the five on-site water systems. For system nos. 5, 9 and 99, only post-treatment samples was collected due to limited accessibility. ALWI collected, preserved and transported each of the samples in accordance with COMAR 26.04.01.14.

ACHD's laboratory analyzed the samples for those constituents of countywide concern. These included total coliform bacteria as specified in COMAR 26.04.01.11A-C, alkalinity, color, conductance, hardness, iron, manganese, nitrate-nitrite nitrogen (COMAR 26.04.01.14(4)(a)), nitrite nitrogen (COMAR 26.04.01.14(4)(b)), pH, and total dissolved solids. The results are included as Appendix A, and suggest potability relative to the samples collected.

4.0 DELINEATION

ALWI delineated a composite surveyed area encompassing areas the plaza topographically upgradient from each well, using generalized criteria developed by MDE for non-community supplies, as modified by ALWI (with ACHD consent) based on the site's rugged topographic setting. ALWI began by using a compositor fixed radius of 1,000 feet around the plaza. From this radial area, ALWI then included all remaining upgradient areas controlled by the site owner

and excluded downgradient areas more than 100 feet from the wellhead as well as areas unlikely to contribute recharge to the well based on intervening streams and/or drainage divides. Because of the rugged topography, ALWI also excluded steeply-sloping cross-gradient areas.

The resultant delineation is shown on the "Water Plant Information" survey forms (Appendix B) and encompasses approximately 185 acres. Within an assumed 300 gallons per day per acre (gpd/ac) of annualized groundwater recharge (Slaughter and Darling, 1962, Table 37, with a 50% correction factor applied by ALWI for the unusually steep slopes), over 55,000 gallons per day exists within the aquifer beneath this surveyed area. In actuality, the modest annualized demands of the wellfield (less than 10,000 gpd) is more than one full order of magnitude smaller than the surveyed area, lending a high degree of conservatism to this analysis.

An interview with the owner suggested little if any seasonal peaking in demand, and ALWI used this to interpret little, if any, seasonal fluctuation of the surveyed area boundary. Negligible nitrate-nitrogen concentrations were detected in the sample ALWI collected. This obviated the need for a nitrate balance assessment.

5.0 CONTAMINANT THREATS ASSESSMENT

ALWI performed a site reconnaissance on December 28, 1998. During the reconnaissance, local land use conditions were observed with emphasis on the potential use, storage and disposal practices of hazardous materials and petroleum products. Such conditions may have included visual evidence for present or former spills, stained or discolored ground surfaces, stressed vegetation, unusual odors, or visible underground storage tank (UST) facilities. Adjacent and nearby properties were also visually scanned for such evidence from the property and nearby public right-of-ways. Off-site properties were not entered. ALWI relied upon the accuracy of historical interview information provided by the on-site manager to provide context for some of its observations.

5.1 POTENTIAL HAZARDS AT THE WELLHEADS

Design, construction and present condition are important factors in determining a well's susceptibility to contamination. Only one of the five wells had a visible tag, but ALWI was not provided a completion report. Accordingly, ALWI could not assess the initial design nor present condition of the casing or grout seal for most of the wells.

ALWI observed that the top of the casing of Well No. 19 terminates below grade, in apparent violation of several provisions¹ within COMAR 26.04.04.07F. Stormwater may enter the vault and may accumulate in this vault and enter the well, entraining microbial contaminants from the dark recesses of the pit as well as various other potential contaminants. Extension of the casing to

¹ This regulation prohibits frost pits, requires pitless adapters, and specifies that the finished height of well casings extend at least 8 inches above natural grade.

above natural grade and the addition of a pitless adapter and conduit well cap would provide greater protection against possible contamination.

ALWI observed that the portion of each remaining well casing exposed at ground surface appeared intact. They were equipped with a conventional pitless-style cap of the type that can sometimes allow insects to enter the well. An upgrade to more modern caps would provide greater protection against microbial contamination. A watertight cap on all five wells would also provide greater protection from occasional flooding of the Potomac River. Finally, the wells terminate in parking areas and are at varying risk of vehicular collision.

5.2 OTHER LOCAL CONTAMINATION RISKS

ALWI observed several potential contamination sources in the delineated area. Each well runs some risk from recirculation of septic effluent from the on-site constructed wetlands, though the low nitrate concentrations detected seem to suggest that this risk is not presently severe. The close proximity of the wells to the Potomac River places it at moderate to high risk for surface water influence as defined in the MDE guidance document. This risk would be better quantified with better information on subsurface borehole conditions (e.g., depth of casing) and the potential for variance in surface water indicator parameters (raw water bacteria; temperature and turbidity) with differing precipitation regimes. Ultimate decisions regarding possible filtration retrofits are appropriately driven by economic considerations (the capital and operational costs of domestic-scale filtration vs. the daily consumption of water). Other specific contamination risks ALWI noted were as follows:

- **5 (Sav-A-Lot)** – ALWI observed various businesses of unknown nature surrounding the wellhead. To the northwest, ALWI observed pipes that were leaking an unknown substance and various dumpsters. These represent possible contamination hazards to the water supply via infiltration from the ground surface. This supply is also closest to the previously mentioned constricted wetlands.
- **19 (TriTown Cinemas)** – ALWI observed that this well casing terminates below grade in the middle of the parking lot. The well should be retrofitted with a pitless adapter and casing extended to above-grade. The vault should be backfilled with inert material taking care to adhere to casing grouting requirements in so doing. The addition of a modern conduit well cap will help prevent the entrance of bacteria into the well. Access for pump repairs and replacements should be maintained and appropriate vehicular protection should be produced for the extended casing.

6.0 CONCLUSION AND RECOMMENDATIONS

ALWI did not find acute conditions suggesting non-potability of a type warranting immediate reporting, resampling, or other emergency corrective action. No discharge to groundwater has been confirmed by any of the facilities or practices ALWI observed. ALWI has ranked its

observations in decreasing order of overall relative risk. ALWI provides specific recommendations at the conclusion of each respective observation or interpretation.

ALWI developed the following recommendations to better assess and protect this water supply.

1. **Surface Water Influence** - Property ownership interests should collect and analyze groundwater samples for indicators of groundwater under the direct influence of surface water (e.g., turbidity, temperature, and bacteria analyses performed daily for four consecutive days immediately after a 0.5-inch rainfall event). One or more wells may be taken out of service depending on the results of those analyses.
2. **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 (SHA) is unlikely to curtail road de-icing practices along Westernport Road (MD Route 135). However, consideration should be given to using non-chemical abrasives on the parking lot for deicing to the degree possible. Baseline and bi-annual sampling for sodium and chlorides should also be considered.
3. **Managed Cross-Connection** – The existing cross-connections provide potential benefits of supply redundancy and blending but only if properly engineered and maintained. ALWI recommends, therefore, that water and wastewater systems at the plaza be managed as a singular and unified utility system with centralized treatment and storage infrastructure.

7.0 SELECTED REFERENCES

Cleaves, Emery T., Jonathan Edwards Jr. and John D. Glaser, 1968. Geologic Map of Maryland: Maryland Geologic Survey, 1:250,000.

MDE Public Drinking Water Program, 1998, Transient Water System Operations Guidance; Guidance For Counties With Delegated Responsibilities (Draft), 45p.

Slaughter, Turbit H. and John M. Darling, 1963, The Water Resources of Allegany and Washington Counties: Maryland Department of Geology, Mines, and Water Resources, Bulletin 24, p. 408.

NONCOMMUNITY WATER SUPPLY SANITARY SURVEY

1. System Name: <u>Sav-A-Lot</u>		2. WAS: <u>5</u>	
7. System Information: Address: <u>Rt. 135, Tri-Town Plaza</u> <u>Westernport, Maryland</u> Phone No.: <u>(301) 359-3096</u>		4. ADC Map/Grid: <u>N/A</u>	5. Tax Map/Plat: <u>N/A</u>
		6. Population: Transient _____ Regular <u>10</u> Total <u>10</u>	
7. Property Information: Owner's Name <u>Mr. Kenneth G. Farley</u> Address: <u>Rt. 135, Tri-Town Plaza</u> <u>Westernport, Maryland</u> Phone No. <u>(301) 359-3096 (301) 359-9669</u>		8. No. Service Connections:	
		9. Type of Facility: Food Service <u>x</u> Church _____ Campground _____ Daycare _____ Other (specify) _____	
10. Contact Person: Name: <u>Kenneth Farley</u> Phone No. <u>(301) 359-9669</u>	11. Operator: Name: _____ Cert. No. _____		

12. Sample History (Has the system had any violations?):

Bacteria: None apparent or reported Nitrate: None apparent or reported

SURVEY RESULTS

13. Comments on System, Recommendations:

ALWI did not find acute conditions suggesting non-potability of a type warranting immediate reporting, resampling, or other emergency corrective action. No discharge to groundwater has been confirmed by any of the facilities or practices ALWI observed. ALWI has ranked its observations in decreasing order of overall relative risk. ALWI provides specific recommendations at the conclusion of each respective observation or interpretation.

ALWI developed the following recommendations to better assess and protect of this water supply.

1. **Surface Water Influence** - Property ownership interests should collect and analyze groundwater samples for indicators of groundwater under the direct influence of surface water (e.g., turbidity, temperature, and bacteria analyses performed daily for four consecutive days immediately after a 0.5-inch rainfall event). One or more wells may be taken out of service depending on the results of those analyses.
2. **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 (SHA) is unlikely to curtail road de-icing practices along Westernport Road (MD Route 135). However, consideration should be given to using non-chemical abrasives on the parking lot for deicing to the degree possible. Baseline and bi-annual sampling for sodium and chlorides should also be considered.
3. **Managed Cross-Connection** – The existing cross-connections provide potential benefits of supply redundancy and blending but only if properly engineered and maintained. ALWI recommends, therefore that water and wastewater systems at the plaza be managed as a singular and unified utility system with centralized treatment and storage infrastructure.

14. Inspected by: Mark W. Eisner	15. Date inspected: <u>12/29/98</u>	16. System Vulnerability Protected _____ Vulnerable <u>Yes (see report)</u>
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WATER PLANT INFORMATION

17. Type of Treatment:
(Check all that apply)

- Disinfection
- Gas Chlorine: _____
- Sodium Hypochlorite _____
- Ultraviolet Radiation
- Iron Removal _____
- Nitrate Removal _____
- PH Neutralizer _____
- Other _____
- Unknown _____

18. System Schematic (Process Flow):



NOTE: This diagram is a simplified schematic of operational process flow observed or described on the date of the reconnaissance. Many water systems possess malfunctioning, disconnected and/or occasionally/regularly-bypassed equipment. Actual treatment processes may differ, therefore, from those shown herein.

19. System Storage:

- Ground Storage _____
- Elevated Storage _____
- Hydropneumatic Tank
- Other _____

20. Storage Capacity:

Typical Domestic

21. Untreated water sampling tap?

Yes _____ No

WELL INFORMATION

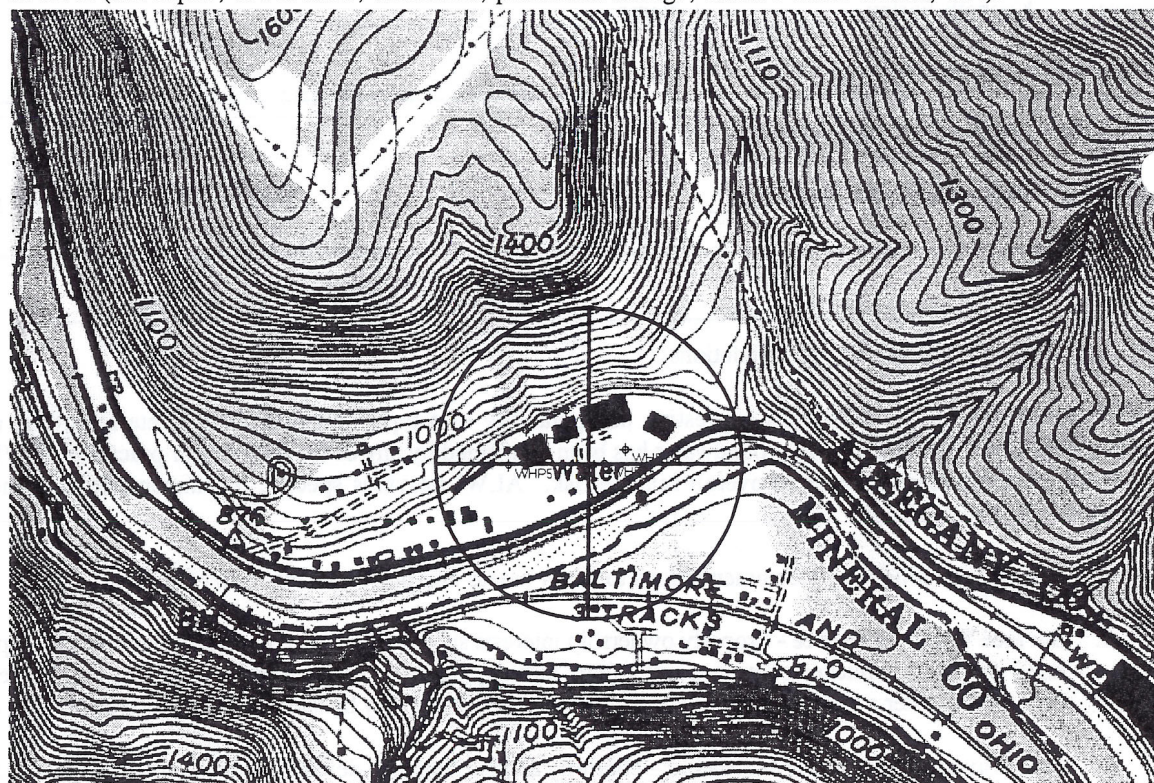
22. Well Information:

- Tag Number: not visible
- Year Drilled: _____
- Casing Depth: _____
- Well Depth: _____
- Well Yield: _____
- Casing Height: _____
- Grout Depth: _____
- Pitless Adapter? _____
- Wiring OK? unknown
- Pump OK? unknown

23. Well Type:

- Drilled
- Driven _____
- Dug _____

24. Well Location Diagram (1 in. = 1250 ft.) with Approximate Distances from Potential Contaminant Sources (i.e. septic, sewer lines, structures, petroleum storage, surface water bodies, etc.):



25. Aquifer:

- Name: Mauch Chunk
- GAP #: _____
- Confined _____
- Unconfined
- Semi-confined _____

26. Quantity Used:

- Daily Avg (gpd) 300
- Pumping Rate (gpm) _____
- Hours run per day _____

27. Well Cap:

- Type? _____
- Seal Tight? O.K.
- Vented? O.K.
- Screened? No
- Conduit OK? O.K.

28. Casing Diameter:

- 2" _____
- 4" _____
- 6"
- Other _____

29. Casing Type:

- PVC _____
- Metal
- Concrete _____

NONCOMMUNITY WATER SUPPLY SANITARY SURVEY

1. System Name: <u>Mac's Restaurant</u>		2. WAS: <u>9</u>	
System Information: Address: <u>Route 1, Tri-Town Plaza</u> <u>Westernport, Maryland</u> Phone No.: <u>(800) 624-2565</u>		4. ADC Map/Grid: <u>N/A</u>	5. Tax Map/Plat: <u>N/A</u>
		6. Population: Transient _____ Regular <u>15</u> Total <u>15</u>	
7. Property Information: Owner's Name <u>Rick Amoruso</u> Address: <u>Route 1, Tri-Town Plaza</u> <u>Westernport, Maryland</u> Phone No. <u>(800) 624-2565 (301) 359-9249</u>		8. No. Service Connections:	
		9. Type of Facility: Food Service <u> x </u> Church _____ Campground _____ Daycare _____ Other (specify) _____	
10. Contact Person: Name: <u>Rick Amoruso</u> Phone No. <u>(301) 359-9249</u>	11. Operator: Name: _____ Cert. No. _____		
12. Sample History (Has the system had any violations?): Bacteria: <u>None apparent or reported</u> Nitrate: <u>None apparent or reported</u>			

SURVEY RESULTS

13. Comments on System, Recommendations:

ALWI developed the following recommendations to better assess and protect this water supply.

1. **Surface Water Influence** - Property ownership interests should collect and analyze groundwater samples for indicators of groundwater under the direct influence of surface water (e.g., turbidity, temperature, and bacteria analyses performed daily for four consecutive days immediately after a 0.5-inch rainfall event). One or more wells may be taken out of service depending on the results of those analyses.
2. **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 (SHA) is unlikely to curtail road de-icing practices along Westernport Road (MD Route 135). However, consideration should be given to using non-chemical abrasives on the parking lot for deicing to the degree possible. Baseline and bi-annual sampling for sodium and chlorides should also be considered.
3. **Managed Cross-Connection** – The existing cross-connections provide potential benefits of supply redundancy and blending but only if properly engineered and maintained. ALWI recommends, therefore, that water and wastewater systems at the plaza be managed as a singular and unified utility system with centralized treatment and storage infrastructure.

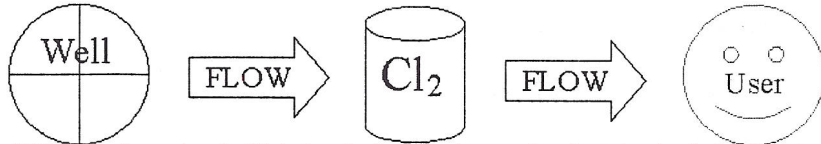
14. Inspected by: <u>Mark W. Eisner</u>	15. Date inspected: <u>12/29/98</u>	16. System Vulnerability Protected _____ Vulnerable <u>Yes (see report)</u>
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WATER PLANT INFORMATION

17. Type of Treatment:
(Check all that apply)

- Disinfection
- Gas Chlorine: _____
- Sodium Hypochlorite _____
- Ultraviolet Radiation _____
- Iron Removal _____
- Nitrate Removal _____
- PH Neutralizer _____
- Other _____
- Unknown _____

18. System Schematic (Process Flow):



NOTE: This diagram is a simplified schematic of operational process flow observed or described on the date of the reconnaissance. Many water systems possess malfunctioning, disconnected and/or occasionally/regularly-bypassed equipment. Actual treatment processes may differ, therefore, from those shown herein.

19. System Storage:

- Ground Storage _____
- Elevated Storage _____
- Hydropneumatic Tank _____
- Other _____

20. Storage Capacity:

Unknown

21. Untreated water sampling tap?

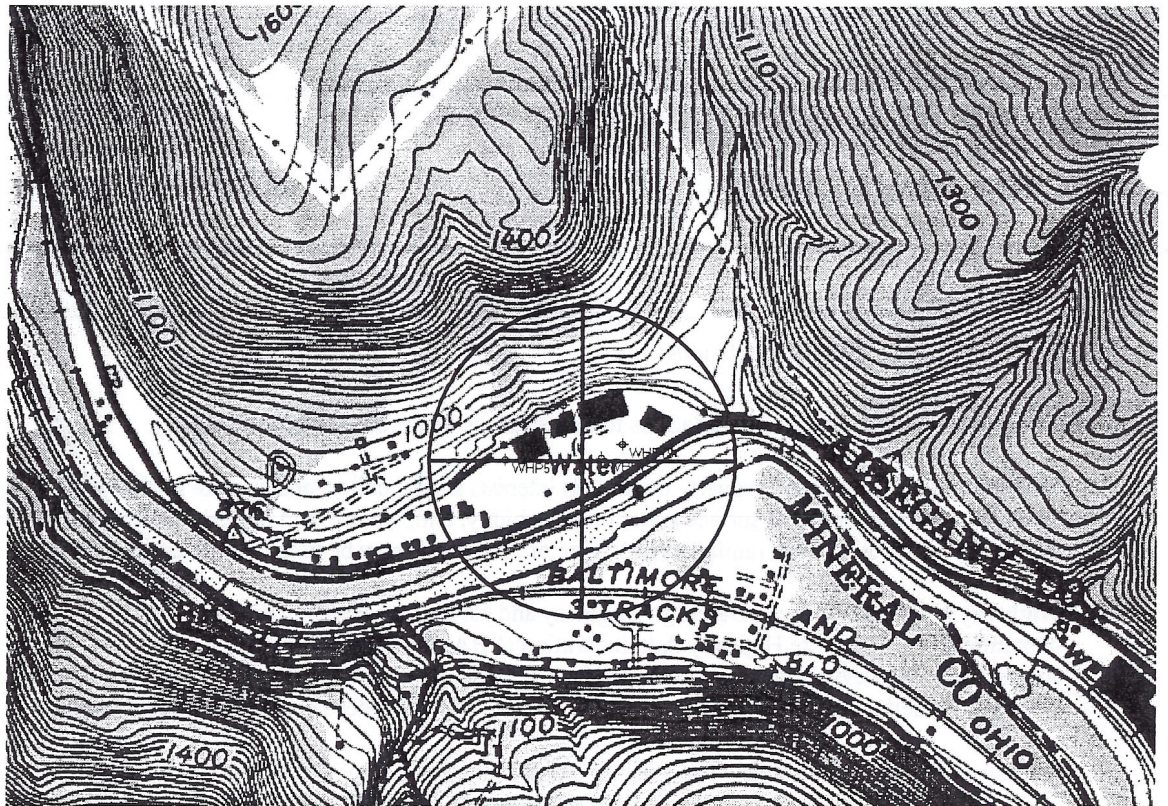
Yes _____ No _____

WELL INFORMATION

22. Well Information:

- Tag Number: no separate well
- Year Drilled: _____
- Casing Depth: _____
- Well Depth: _____
- Well Yield: _____
- Casing Height: _____
- Grout Depth: _____
- Pitless Adapter? _____
- Wiring OK? unknown
- Pump OK? unknown

24. Well Location Diagram (1 in. = 1250 ft.) with Approximate Distances from Potential Contaminant Sources (i.e. septic, sewer lines, structures, petroleum storage, surface water bodies, etc.):



23. Well Type:

- Drilled _____
- Driven _____
- Dug _____

25. Aquifer:

- Name: Mauch Chunk
- GAP #: _____
- Confined _____
- Unconfined _____
- Semi-confined _____

26. Quantity Used:

- Daily Avg (gpd) 500
- Pumping Rate (gpm) _____
- Hours run per day _____

27. Well Cap:

- Type? _____
- Seal Tight? O.K.
- Vented? O.K.
- Screened? No
- Conduit OK? O.K.

28. Casing Diameter:

- 2" _____
- 4" _____
- 6" _____
- Other _____

29. Casing Type:

- PVC _____
- Metal _____
- Concrete _____

NONCOMMUNITY WATER SUPPLY SANITARY SURVEY

1. System Name: Moran Liquors		2. WAS: 15	
System Information: Address: <u>P.O. Dr. E, Tri-Town Plaza</u> <u>Westernport, Maryland</u> Phone No.: <u>(301) 359-0622</u>		4. ADC Map/Grid: N/A	5. Tax Map/Plat: N/A
		6. Population:	
		Transient	<u>0</u>
		Total	<u>2</u>
7. Property Information:		8. No. Service Connections:	
Owner's Name <u>D.E., J.P., & W.H. Moran</u> Address: <u>P.O. Dr. E, Tri-Town Plaza</u> <u>Westernport, Maryland</u> Phone No. <u>(301) 359-0622</u>		9. Type of Facility:	
		Food Service	<u>x</u>
		Church	_____
		Campground	_____
		Daycare	_____
		Other (specify)	_____
10. Contact Person:	11. Operator:		
Name: <u>J.P. Moran</u>	Name: _____		
Phone No. <u>(301) 359-0622</u>	Cert. No. _____		
12. Sample History (Has the system had any violations?):			
Bacteria: <u>None apparent or reported</u>		Nitrate: <u>None apparent or reported</u>	

SURVEY RESULTS

13. Comments on System, Recommendations:

ALWI did not find acute conditions suggesting non-potability of a type warranting immediate reporting, resampling, or other emergency corrective action. No discharge to groundwater has been confirmed by any of the facilities or practices ALWI observed. ALWI has ranked its observations in decreasing order of overall relative risk. ALWI provides specific recommendations at the conclusion of each respective observation or interpretation. ALWI developed the following recommendations to better assess and protect of this water supply.

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3. **Managed Cross-Connection** – The existing cross-connections provide potential benefits of supply redundancy and blending but only if properly engineered and maintained. ALWI recommends, therefore that water and wastewater systems at the plaza be managed as a singular and unified utility system with centralized treatment and storage infrastructure.

14. Inspected by:	15. Date inspected:	16. System Vulnerability
Mark W. Eisner	12/29/98	Protected _____ Vulnerable <u>Yes (see report)</u>

WATER PLANT INFORMATION

17. Type of Treatment:
(Check all that apply)

- Disinfection
- Gas Chlorine: _____
- Sodium Hypochlorite _____
- Ultraviolet Radiation
- Iron Removal _____
- Nitrate Removal _____
- PH Neutralizer _____
- Other _____
- Unknown _____

18. System Schematic (Process Flow):



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- Ground Storage _____
- Elevated Storage _____
- Hydropneumatic Tank
- Other _____

20. Storage Capacity:

Typical Domestic

21. Untreated water sampling tap?

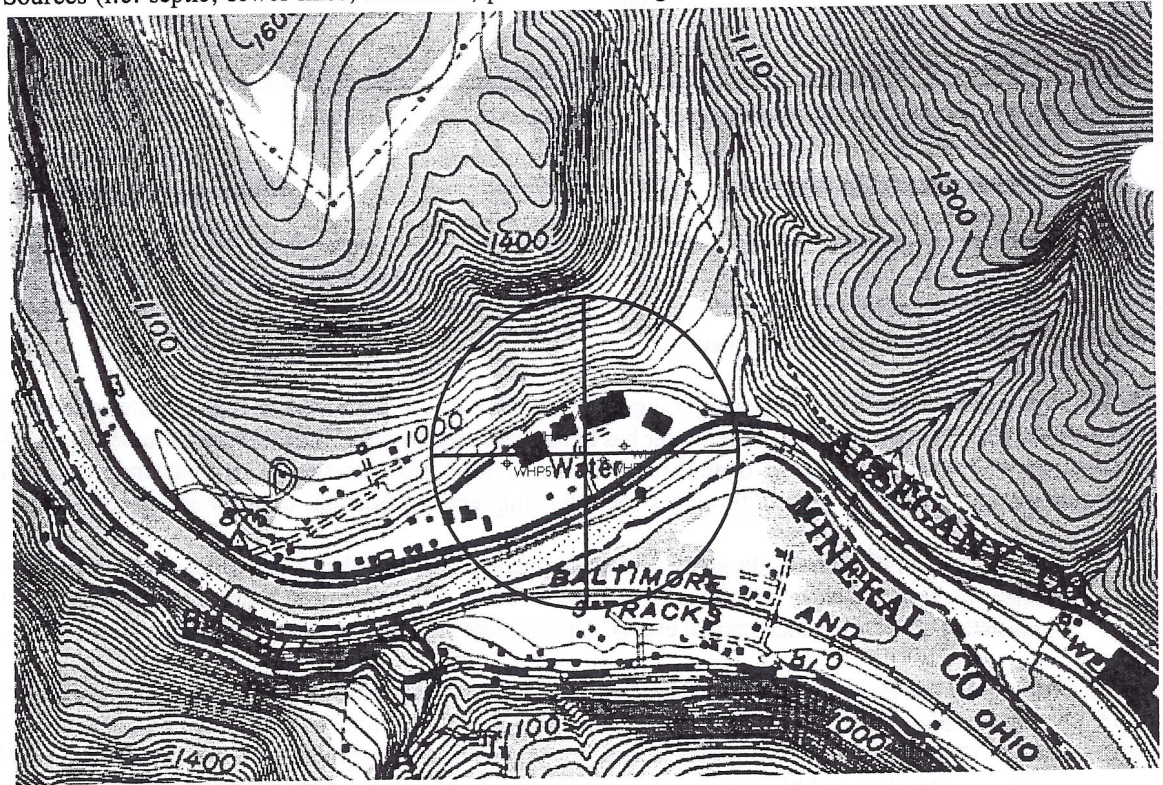
Yes No _____

WELL INFORMATION

22. Well Information:

- Tag Number: not visible
- Year Drilled: _____
- Casing Depth: _____
- Well Depth: _____
- Well Yield: _____
- Casing Height: _____
- Grout Depth: _____
- Pitless Adapter? _____
- Wiring OK? unknown
- Pump OK? unknown

24. Well Location Diagram (1 in. = 1250 ft.) with Approximate Distances from Potential Contaminant Sources (i.e. septic, sewer lines, structures, petroleum storage, surface water bodies, etc.):



23. Well Type:

- Drilled
- Driven _____
- Dug _____

25. Aquifer:

- Name: Maunch Chunk
- GAP #: _____
- Confined _____
- Unconfined
- Semi-confined _____

26. Quantity Used:

- Daily Avg (gpd) 200
- Pumping Rate (gpm) unknown
- Hours run per day unknown

27. Well Cap:

- Seal Tight? O.K.
- Vented? O.K.
- Screened? No
- Conduit OK? O.K.

28. Casing Diameter:

- 2" _____
- 4" _____
- 6"
- Other _____

29. Casing Type:

- PVC _____
- Metal
- Concrete _____

NONCOMMUNITY WATER SUPPLY SANITARY SURVEY

1. System Name: <u>Tri-Towns Cinema 1 & 2</u>		2. WAS: <u>19</u>	
System Information: Address: <u>Tri-Towns Shopping Center</u> <u>Westernport, Maryland</u> Phone No.: <u>(301) 359-3818</u>		4. ADC Map/Grid: <u>N/A</u>	5. Tax Map/Plat: <u>N/A</u>
		6. Population: Transient _____ Regular _____ Total <u>unknown</u>	
7. Property Information: Owner's Name <u>CAPA, Ltd.</u> Address: <u>Tri-Towns Shopping Center</u> <u>Westernport, Maryland</u> Phone No. <u>(301) 359-3818 (301) 332-0222</u>		8. No. Service Connections:	
		9. Type of Facility: Food Service _____ Church _____ Campground _____ Daycare _____ Other (specify) <u>Shopping Center</u>	
10. Contact Person: Name: <u>CAPA, Ltd</u> Phone No. <u>(301) 332-0222</u>	11. Operator: Name: _____ Cert. No. _____		
12. Sample History (Has the system had any violations?): Bacteria: <u>None apparent or reported</u> Nitrate: <u>None apparent or reported</u>			

SURVEY RESULTS

13. Comments on System, Recommendations:

ALWI developed the following recommendations to better assess and protect of this water supply.

1. **Surface Water Influence** - Property ownership interests should collect and analyze groundwater samples for indicators of groundwater under the direct influence of surface water (e.g., turbidity, temperature, and bacteria analyses performed daily for four consecutive days immediately after a 0.5-inch rainfall event). One or more wells may be taken out of service depending on the results of those analyses.
2. **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 (SHA) is unlikely to curtail road de-icing practices along Westernport Road (MD Route 135). However, consideration should be given to using non-chemical abrasives on the parking lot for deicing to the degree possible. Baseline and bi-annual sampling for sodium and chlorides should also be considered.
3. **Managed Cross-Connection** – The existing cross-connections provide potential benefits of supply redundancy and blending but only if properly engineered and maintained. ALWI recommends, therefore that water and wastewater systems at the plaza be managed as a singular and unified utility system with centralized treatment and storage infrastructure.

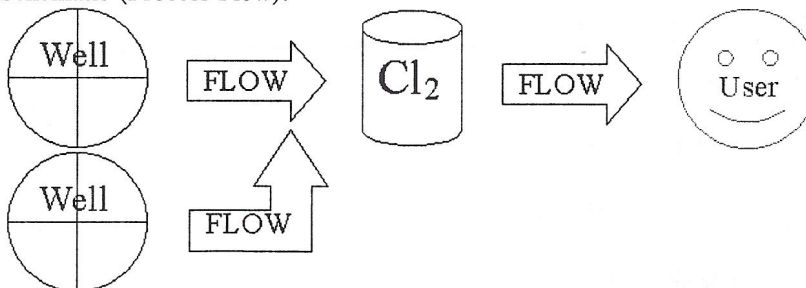
14. Inspected by: <u>Mark W. Eisner</u>	15. Date inspected:	16. System Vulnerability Protected _____ Vulnerable <u>yes (see report)</u>
--	---------------------	--

WATER PLANT INFORMATION

17. Type of Treatment:
(Check all that apply)

- Disinfection
- Gas Chlorine: _____
- Sodium Hypochlorite _____
- Ultraviolet Radiation _____
- Iron Removal _____
- Nitrate Removal _____
- PH Neutralizer _____
- Other _____
- Unknown _____

18. System Schematic (Process Flow):



NOTE: This diagram is a simplified schematic of operational process flow observed or described on the date of the reconnaissance. Many water systems possess malfunctioning, disconnected and/or occasionally/regularly-bypassed equipment. Actual treatment processes may differ, therefore, from those shown herein.

19. System Storage:

- Ground Storage _____
- Elevated Storage _____
- Hydropneumatic Tank _____
- Other _____

20. Storage Capacity:

Typical Domestic

21. Untreated water sampling tap?

Yes _____ No _____

WELL INFORMATION

22. Well Information:

- Tag Number: _____
- Year Drilled: _____
- Casing Depth: _____
- Well Depth: _____
- Well Yield: _____
- Casing Height: _____
- Grout Depth: _____
- Pitless Adapter? _____
- Wiring OK? unknown
- Pump OK? unknown

24. Well Location Diagram (1 in. = 1250 ft.) with Approximate Distances from Potential Contaminant Sources (i.e. septic, sewer lines, structures, petroleum storage, surface water bodies, etc.):



23. Well Type:

- Drilled _____
- Driven _____
- Dug _____

25. Aquifer:

- Name: Mauch Chunk
- GAP #: _____
- Confined _____
- Unconfined _____
- Semi-confined _____

26. Quantity Used:

- Daily Avg (gpd) 300
- Pumping Rate (gpm) _____
- Hours run per day _____

27. Well Cap:

- Type? _____
- Seal Tight? O.K.
- Vented? O.K.
- Screened? No
- Conduit OK? O.K.

28. Casing Diameter:

- 2" _____
- 4" _____
- 6" _____
- Other _____

29. Casing Type:

- PVC _____
- Metal _____
- Concrete _____

NONCOMMUNITY WATER SUPPLY SANITARY SURVEY

1. System Name: <u>Tri-Town Plaza (Mac's/Diliddos/Revco)</u>		2. WAS: <u>99</u>	
. System Information: Address: <u>P.O. Box 807</u> <u>Keyser, Maryland</u> Phone No.: <u>(301) 786-7019</u>		4. ADC Map/Grid: <u>N/A</u>	5. Tax Map/Plat: <u>N/A</u>
		6. Population: Transient _____ Regular <u>6</u> Total <u>6</u>	
7. Property Information: Owner's Name <u>Rick Amoruso</u> Address: <u>P.O. Box 807</u> <u>Keyser, Maryland</u> Phone No. <u>(301) 786-7019</u>		8. No. Service Connections:	
		9. Type of Facility: Food Service <u> x </u> Church _____ Campground _____ Daycare _____ Other (specify) <u> x </u>	
10. Contact Person: Name: <u>Rick Amoruso</u> Phone No. <u>(301) 786-7019</u>	11. Operator: Name: _____ Cert. No. _____		

Sample History (Has the system had any violations?):

Bacteria: None apparent or reported Nitrate: None apparent or reported

SURVEY RESULTS

13. Comments on System, Recommendations:

ALWI developed the following recommendations to better assess and protect of this water supply.

1. **Surface Water Influence** - Property ownership interests should collect and analyze groundwater samples for indicators of groundwater under the direct influence of surface water (e.g., turbidity, temperature, and bacteria analyses performed daily for four consecutive days immediately after a 0.5-inch rainfall event). One or more wells may be taken out of service depending on the results of those analyses.
2. **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 (SHA) is unlikely to curtail road de-icing practices along Westernport Road (MD Route 135). However, consideration should be given to using non-chemical abrasives on the parking lot for deicing to the degree possible. Baseline and bi-annual sampling for sodium and chlorides should also be considered.
3. **Managed Cross-Connection** – The existing cross-connections provide potential benefits of supply redundancy and blending but only if properly engineered and maintained. ALWI recommends, therefore that water and wastewater systems at the plaza be managed as a singular and unified utility system with centralized treatment and storage infrastructure.

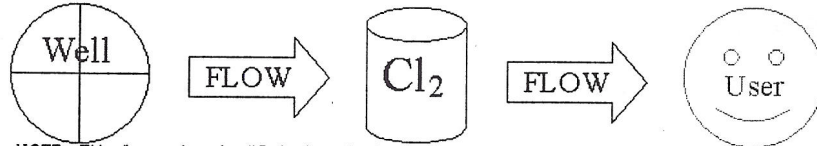
14. Inspected by: Mark W. Eisner	15. Date inspected: 12/29/98	16. System Vulnerability Protected _____ Vulnerable <u>Yes (see report)</u>
---	-------------------------------------	--

WATER PLANT INFORMATION

17. Type of Treatment:
(Check all that apply)

- Disinfection
 Gas Chlorine: _____
 Sodium Hypochlorite: x
 Ultraviolet Radiation: _____
 Iron Removal: _____
 Nitrate Removal: _____
 PH Neutralizer: _____
 Other: _____
 Unknown: _____

18. System Schematic (Process Flow):



NOTE: This diagram is a simplified schematic of operational process flow observed or described on the date of the reconnaissance. Many water systems possess malfunctioning, disconnected and/or occasionally/regularly-bypassed equipment. Actual treatment processes may differ, therefore, from those shown herein.

19. System Storage:

- Ground Storage: _____
 Elevated Storage: _____
 Hydropneumatic Tank: x
 Other: _____

20. Storage Capacity:

Typical Domestic

21. Untreated water sampling tap?

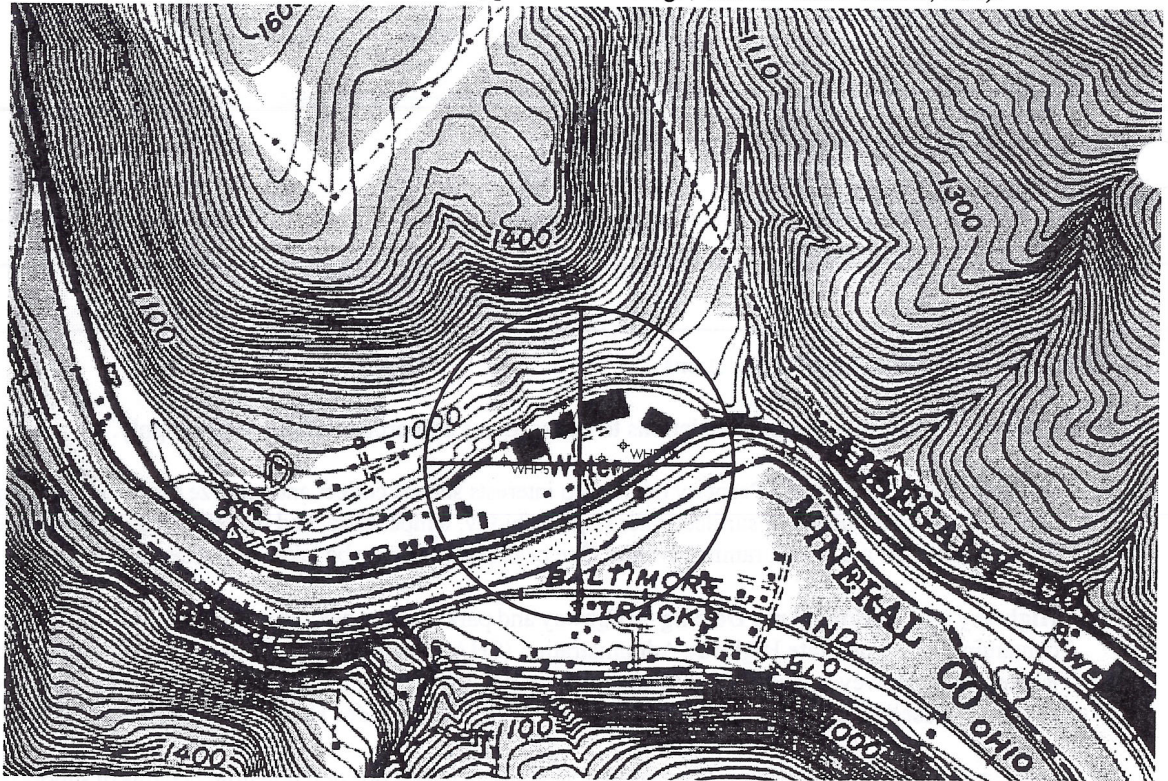
Yes _____ No x

WELL INFORMATION

22. Well Information:

- Tag Number: AL-81-0284
 Year Drilled: _____
 Casing Depth: _____
 Well Depth: _____
 Well Yield: _____
 Casing Height: _____
 Grout Depth: _____
 Pitless Adapter? _____
 Wiring OK? unknown
 Pump OK? unknown

24. Well Location Diagram (1 in. = 1250 ft.) with Approximate Distances from Potential Contaminant Sources (i.e. septic, sewer lines, structures, petroleum storage, surface water bodies, etc.):



23. Well Type:

- Drilled: x
 Driven: _____
 Dug: _____

25. Aquifer:

- Name: Maunch Chunk
 GAP #: _____
 Confined: _____
 Unconfined: x
 Semi-confined: _____

26. Quantity Used:

- Daily Avg (gpd): <1,000
 Pumping Rate (gpm): unknown
 Hours run per day: unknown

27. Well Cap:
Type?

- Seal Tight? O.K.
 Vented? O.K.
 Screened? No
 Conduit OK? O.K.

28. Casing Diameter:

- 2" _____
 4" _____
 6" x
 Other: _____

29. Casing Type:

- PVC: _____
 Metal: x
 Concrete: _____

**Preliminary
Draft
Subject to Revision**



EXPLANATION:

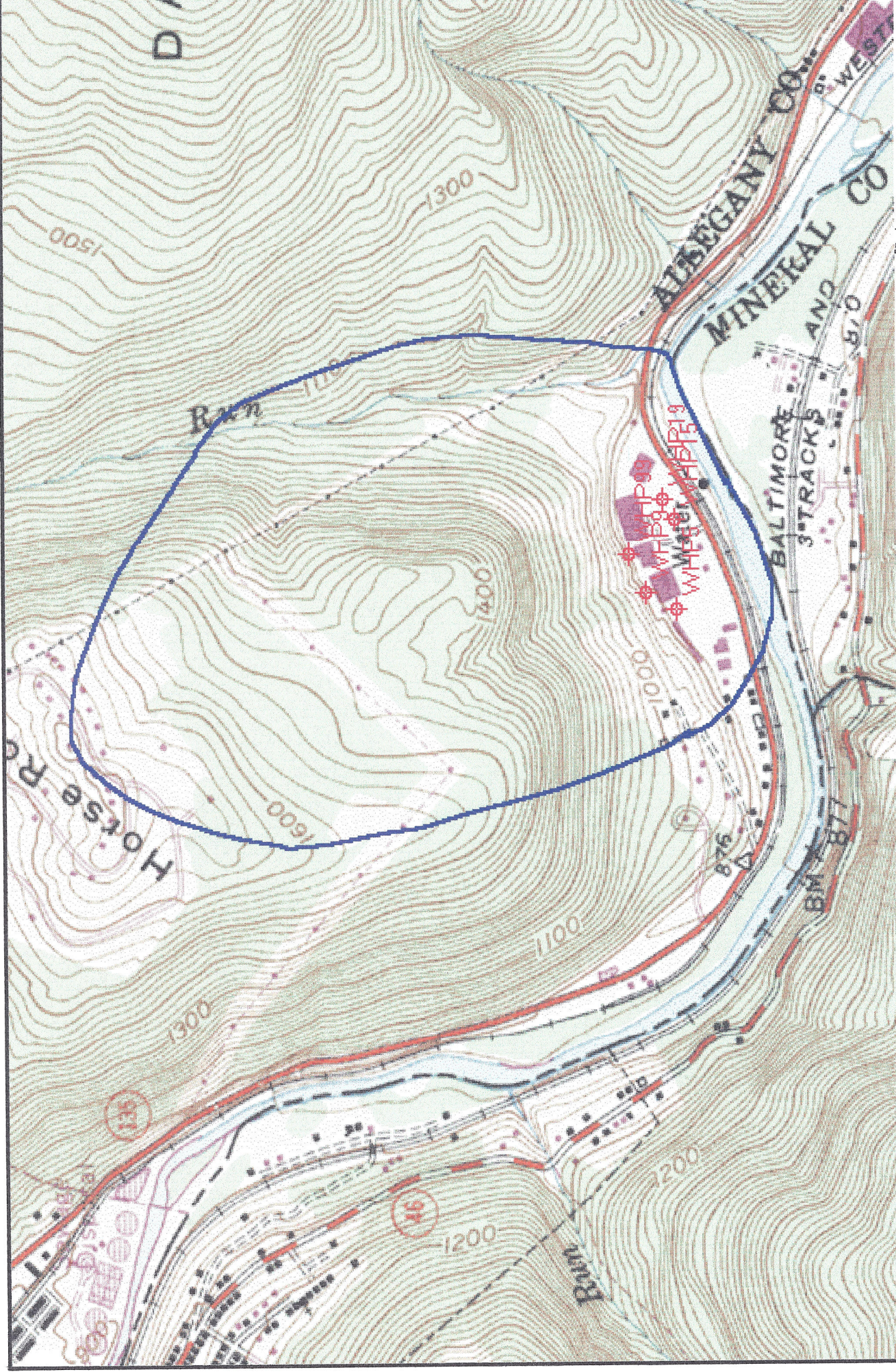
TNC or NTNC well

- ⊕ 5 Sav-A-Lot
- ⊕ 9 Mac's Restaurant
- ⊕ 15 Moran Liquors
- ⊕ 19 Tritown Cinema
- ⊕ 99 Dillidos

topographically-constrained sourced water protection area [includes areas within 1,000 feet of each surveyed well unless clear hydrogeologic evidence suggested a need for a site-specific modification of this MDE criterion.



APPROXIMATE SCALE 1"=1600 FT



Notes:

- 1 Base map imported from digital USGS topographic quadrangle maps for Westport, MD (1981 revision), provided to ALWI under license by Maptech, Inc.
- 2 This figure is integral to a written report and should only be used in that context.
- 3 This figure is solely intended to facilitate regulatory review and is not intended to be used for boundary verification, well location or survey control purposes.

Client: ALLEGANY COUNTY HEALTH DEPARTMENT



Project: NON-COMMUNITY GROUNDWATER SOURCE ASSESSMENT PROGRAM

Prepared Pursuant to the Requirements of:
**MD DEPT. OF THE ENVIRONMENT
PUBLIC DRINKING WATER PROGRAM**

**Figure 1.
Composite
Source Water
Protection Area
for Tritown Plaza**
October, 1999