SPRING SOURCE AREA SURVEY
SPRING VALLEY CAMPGROUND
ACHD SITE NO. 97
Spring Gap, 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 spring source protection plan for Spring Valley Campground (the Campground), located on the south side of Old Oldtown Road and adjacent to an unnamed tributary of the North Branch of the Potomac River in southern Allegany County, Maryland. This site, designated No. 97 by ACHD, is served by a spring that issues from a sloping, wooded area on the east side of Martin Mountain, immediately north of the campground facility.

The draft 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 interprets that the seasonal operations and the nature of the business combine to suggest that this water system is transient non-community system (TNC).

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 well 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 well water supplies both transient and non-transient in nature. ACHD, in cooperation with MDE, established this program to bring existing non-community well water supplies into compliance with the coming regulations. At the direction of ACHD, ALWI applied appropriate provisions of the MDE Wellhead Protection Program to this spring source assessment.

1.2 SCOPE

ALWI prepared this spring source protection plan 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 spring source, 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 the spring at the time of the field reconnaissance. Said photographs are stored on ACHD's computer system. ALWI interviewed an employee to document information on the use patterns, history and problems associated with the supply.

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

2.0 WATER QUALITY ASSESSMENT

Slaughter and Darling (1962) reported the water quality from the Hamilton Group, the local bedrock geology as locally variable (iron concentrations range from 0.79 to as much as 8.2 micrograms per liter (mg/l); hardness ranges from 213 to 227 mg/l; and pH ranges from 7.1 to 7.7). ALWI interpreted that the slight reddish colors of the local rock exposures as likely attributable to the trace presence of iron.

Early in September, ACHD collected baseline water samples in accordance with the MDE sampling procedures specified in COMAR 26.08.05. 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.

3.0 DELINEATION OF SOURCE PROTECTION AREA

ALWI delineated a surveyed area surrounding this site's spring using generalized criteria developed by MDE for non-community supplies, as modified by ALWI (with ACHD consent)

based on the specific topographic setting of the site. The resultant delineation is shown on the "Water Plant Information" survey form (Appendix B). ALWI used a fixed radius of 1,000 feet around the well, which creates an area of approximately 72 acres. Within an assumed 600 gallons per day per acre (gpd/ac) of annualized groundwater recharge (Slaughter and Darling, 1962, Table 37), slightly more than 43,000 gallons per day exists within the aquifer beneath this surveyed area. In actuality, the modest demand of this well is much smaller than the total available in the surveyed area, lending a high degree of conservatism to this analysis.

Field observations suggested little if any seasonal peaking in demand, except possibly during hunting season and ALWI used this to interpret little, if any, seasonal fluctuation of the boundary of the delineated area. Negligible nitrate-nitrogen concentrations were detected in the sample ALWI collected. This obviated the need for a nitrate balance assessment.

4.0 CONTAMINANT THREATS ASSESSMENT

ALWI performed a site reconnaissance on September 22, 1999; this reconnaissance supplemented a site visit made by ACHD personnel earlier in September. 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.

Spring sources are at high risk for surface water influence as defined in the MDE guidance document. This risk would be better quantified with better information on the construction of the catchment potential for variance in surface water indicator parameters (raw water bacteria; temperature and turbidity) with differing precipitation regimes. Ultimate decisions regarding possible filtration retrofits and/or bottled water conversions are appropriately driven by economic considerations.

ALWI observed that this specific spring originates from shallow bedrock fractures that issue into the bases of several concrete vaults. Some of these vaults are covered with metal lids and some are not. The vaults are connected by a complex network of plastic and metal above-ground pipes. As now constructed and protected, the spring boxes may harbor sources of contamination. Appropriate sanitation of these structures is important to prevent possible contamination of the water supply with bacteria or other constituents of surface water runoff. Potential potability risks may arise from animal feces and insects entering the spring boxes, particularly if freezing cracks the pipes.

ALWI performed a local reconnaissance in an attempt to identify potential contamination sources in the delineated surveyed area. ALWI identified no obvious sources of contamination other than the on-site risks listed above.

5.0 CONCLUSION AND RECOMMENDATIONS

ALWI found that the supply appears potable relative to the analyses performed. No discharge to groundwater has been confirmed by any of the facilities or practices ALWI observed. ALWI has ranked its observation in decreasing order of overall relative risk. ALWI provides specific recommendations at the conclusion of each respective observation or interpretation.

1. **Surface Water Influence** – The spring source is at "high" risk of surface water influence as defined by MDE. 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). Depending on the results of the analyses indicated above, business ownership interests should evaluate the cost and feasibility of retrofitting the existing water supply system with appropriate filtration measures to better protect from human health pathogens typically found in surface water (e.g., *Giardia* and *Cryptosporidium*). ALWI believes that conversion to bottled sources will prove more cost-effective, though conversion to well water could also be considered. If no action is taken to investigate and mitigate this risk, water should be boiled for ten minutes before commercial use and appropriate placarding should be provided to warn against use of an untested source for potable purposes.

2. **Improve Sanitation and Infrastructure** – In their present condition, the spring boxes represent sources of contamination. ALWI observed insects on the metal lids covering some of the vaults. Improved vaults of stainless steel construction and/or air-tight seals could block animal feces and other sources of bacterial and microbial contamination from collecting in the vaults. The above-ground pipes could potentially freeze and possibly burst in cold temperatures. Insulating the pipes or running them underground could prevent this problem.

6.0 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: Spring Valley Campground

2. WAS: 97

. System Information:

Address: 14400 Old Oldtown Road, SE

Oldtown, Maryland

Phone No.: (301) 478-5780

4. ADC Map/Grid: N/A

5. Tax Map/Plat: N/A

6. Population:

Transient _____
Regular _____
Total unknown

7. Property Information:

Owner's Name Jacob Mullenax, Jr.

Address: 14400 Old Oldtown Road, SE

Oldtown, Maryland

Phone No.: (301) 478-5780

8. No. Service Connections:

9. Type of Facility:

Food Service _____
Church _____
Campground x
Daycare _____
Other (specify) _____

10. Contact Person:

Name: Jacob Mullenax, Jr.

Phone No. (301) 478-5780

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:

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14. Inspected by:

Mark W. Eisner

15. Date inspected:

09/22/99

16. System Vulnerability

Protected _____ Vulnerable Yes (see report)

WATER PLANT INFORMATION

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

Disinfection
- Gas Chlorine: _____
- Sodium Hypochlorite _____
- Ultraviolet Radiation ___x___

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 _____

WELL INFORMATION

22. Well Information:

Tag Number: not visible

Year Drilled: _____

Casing Depth: _____

Well Depth: _____

Well Yield: _____

Casing Height: _____

Grout Depth: _____

Pitless Adapter? _____

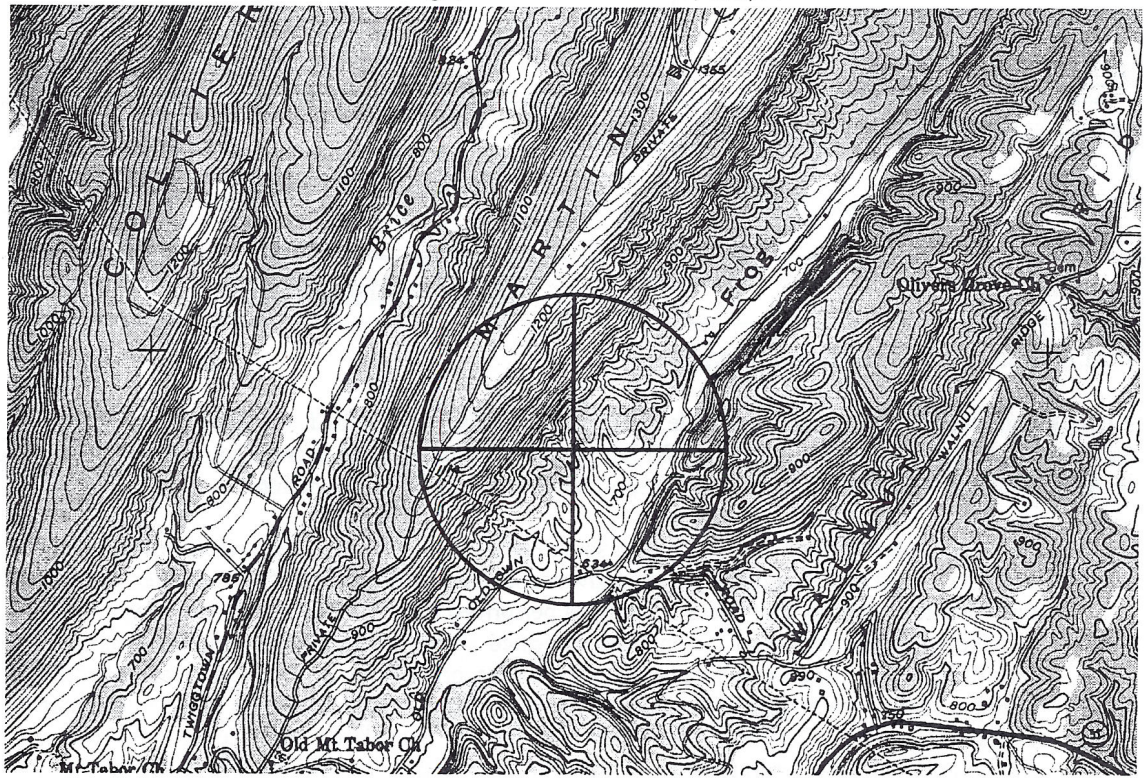
Wiring OK? unknown

Pump OK? unknown

23. Well Type: N/A

Drilled _____
Driven _____
Dug _____

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



25. Aquifer:

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

26. Quantity Used:

Daily Avg (gpd) <600
Pumping Rate (gpm) _____
Hours run per day _____

27. Well Cap: N/A

Type? _____
Seal Tight? _____
Vented? _____
Screened? _____
Conduit OK? _____

28. Casing Diameter:
N/A

2" _____
4" _____
6" _____
Other _____

29. Casing Type:
N/A

PVC _____
Metal _____
Concrete _____