Integrated Source Water Protection Project

Susan L. Grunwald
Samuel A. Shingleton
B. Roger Carter

GEORGIA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION
GEORGIA GEOLOGIC SURVEY

Atlanta
1997

PROJECT REPORT 30

Integrated Source Water Protection Project

Susan L. Grunwald
Samuel A. Shingleton
B. Roger Carter

GEORGIA DEPARTMENT OF NATURAL RESOURCES
Lonice C. Barrett, Commissioner

ENVIRONMENTAL PROTECTION DIVISION
Harold F. Reheis, Director

GEORGIA GEOLOGIC SURVEY
William H. McLemore, State Geologist

Prepared in cooperation with the U.S. Environmental Protection Agency.
This report was funded in part through a grant from the U.S. Environmental Protection Agency under provisions of Section 1442 of the Federal Safe Drinking Water Act of 1977.

Atlanta
1997

PROJECT REPORT 30

TABLE OF CONTENTS

List of Tables

Appendix

EXECUTIVE SUMMARY

In June 1994, the Environmental Protection Division (EPD) received an Abatement, Control and Compliance grant from the U.S. Environmental Protection Agency under Section 1442(b) of the federal Safe Drinking Water Act, to implement an Integrated Source Water Protection Project. The primary objective of the project was to provide source water protection plans to a select group of economically disadvantaged, rural, and/or minority communities served by public water systems. The secondary objective was to utilize volunteers to provide pollution source inventories.

After an initial screening of 68 water systems, EPD selected 23 systems for participation in the project. Twenty-one of the water systems are ground water dependent; two rely on surface water as their drinking water source. Selected characteristics of the 23 water systems that participated are on the following table titled "Selected Characteristics for Participating Water Systems."

For each water system, EPD delineated inner and outer management areas, completed a potential pollution source inventory, and prepared a source water protection plan. Volunteers assisted in the preparation of the pollution source inventory and reviewed the completed Source Water Protection Plans. A VISTA (Volunteers in Service to America) volunteer, RSVP (Retired Senior Volunteer Program) volunteers, and local community volunteers assisted with the project.

Volunteers assisted in the plan development for 15 of the 23 water systems. Unfortunately, the volunteers were unable to complete a source water protection plan without substantial EPD involvement. EPD expended considerable effort to recruit and mentor the volunteers, for relatively low contributions to actual plan development. Based on this experience, EPD recommends not using volunteers to develop source water protection plans in the future.

Another objective of the Project was to determine the recent compliance history (1991-1995) of the targeted water systems. The files reveal that most of the compliance problems deal with monitoring violations; the only MCL exceedances were for coliform bacteria.

Selected Characteristics for Participating Water Systems

	Demographics			Water Source		System Type		Aquifer Type		
Community	Minority	Low Income	Rural	Ground Water	Surface Water	Municipal	Non Municipal	Karst	Coastal Plain	Piedmont & Blue Ridge
Brown Terrace	Yes	Yes	Yes	Yes			Yes		Yes	
Camak	Yes	Yes	Yes	Yes		Yes				Yes
Cave Springs		Yes	Yes	Yes		Yes		Yes		Yes
Culloden	Yes	Yes	Yes	Yes		Yes				Yes
Eddie Daniels	Yes	Yes		Yes			Yes	Yes		
Ellijay		Yes	Yes	Yes		Yes				Yes
Hancock	Yes	Yes	Yes	Yes			Yes			Yes
Lone Oak	Yes	Yes	Yes	Yes		Yes				Yes
Manchester*	Yes	Yes	Yes		Yes	Yes				
Martinez		Yes		Yes			Yes			Yes
Martin Luther King	Yes	Yes		Yes			Yes	Yes		
Menlo		Yes	Yes	Yes		Yes		Yes		
Mineral Bluff		Yes	Yes	Yes		Yes				Yes
Morganton		Yes	Yes	Yes		Yes				Yes
Pine Mt Valley	Yes	Yes	Yes	Yes			Yes			Yes
Siloam	Yes	Yes	Yes	Yes		Yes				Yes
Tallulah Falls		Yes	Yes	Yes		Yes				Yes
Thunderhill		Yes	Yes	Yes			Yes			Yes
Warm Springs		Yes	Yes	Yes		Yes				Yes
White Plains	Yes	Yes	Yes	Yes		Yes				Yes
Woodbury*	Yes	Yes	Yes		Yes	Yes				
Woodville	Yes	Yes	Yes	Yes		Yes				Yes
Young Harris		Yes	Yes	Yes		Yes				Yes
Totals: 23	13	23	20	21	2	16	7	4	1	16

* Indicates surface water system, no aquifer designation provided.

1.0 INTRODUCTION

The Georgia Environmental Protection Division (EPD) is implementing a U.S. Environmental Protection Agency (EPA) approved (letter received September 30,1992) Wellhead Protection Program through the 1993 amendments to the Georgia Safe Drinking Water Act (SDWA) of 1977. EPD is responsible for wellhead protection area delineations, potential pollution source inventories, and the development of Wellhead Protection Plans (WHPP) for municipal drinking water systems. The WHPP is a tool to coordinate regulatory, permitting, and analytical testing requirements for municipal public water systems so that any new potential pollution sources can be "steered away" from wellhead protection areas, and existing sources can be appropriately managed/monitored.

In June 1994, EPD received an Abatement, Control and Compliance (AC&C) grant from the EPA under Section 1442(b) of the SDWA to implement an Integrated Source Water Protection Project. The primary objective of the project was to provide source water protection plans (also known as wellhead protection plans) to a select group of economically disadvantaged, rural, and/or minority communities served by public water systems. A secondary objective was to utilize the services of volunteers to assess whether such individuals could provide meaningful assistance to professionals performing pollution source inventories. The water systems chosen depend predominantly upon a ground water source, vulnerable to contamination. Two water systems, however, depend on a surface water source for drinking purposes. The project started in August 1994. This report describes the activities, progress and results of the project for the period August 1994 through March 1996.

The AC&C Project was a joint effort between EPA's Ground Water Protection and Drinking Water Management Programs and EPD's Geologic Survey and Water Resources Management Branches. Additional assistance was provided by the following:

- EPD's Hazardous Waste Management Branch
- Georgia Office of the Corporation for National Service
- Corporation for National Services's Volunteers in Service to America (VISTA)
- Retired Senior Volunteer Program (RSVP)
- Gainesville College
- United States Forest Service

The original project schedule called for completion of all source water protection plans by July 1995. All plans, however, were completed and submitted

to EPA by the revised, approved completion date of March 1996. The primary factor that led to the schedule extension was the considerable time required for obtaining volunteers.

2.0 SELECTION OF COMMUNITY-BASED SYSTEMS

The methodology for selecting the communities chosen for the project is outlined in Sections 2.1 and 2.2. Overall tabulations of the systems considered for the project and their demographic and hydrogeologic characteristics are in Sections 2.3 and 2.4.

2.1 Selection Protocol

The selection protocol was based on the premise that targeted public water systems/communities would have the following characteristics:

- Their location should be in rural areas of Georgia.
- The income level of its citizens should be lower than average for Georgia.
- The majority of its citizens should be minority.
- The community should be permanent (i.e., town, subdivision, mobile home park, etc).
- The wells serving the community should be completed in unconfined aquifers (e.g., more susceptible to pollution than confined aquifers).
- There should be ground-water sources for ten municipal and nine non-municipal public water systems and surface water sources for two systems (a total of 21 systems).

The 1990 U.S. Bureau of Census data were the starting point to prioritize water systems. Utilizing data bases from EPD's Drinking Water Program, sixty-eight potentially acceptable water supply systems were identified (see Section 2.3).

To assist in priority setting and selection, EPD initially ranked the sixty-eight public water systems according to population density. For the ground- water based systems, low population density in the vicinity of the well served as a surrogate for exhibiting the rural nature of the community. Additional factors considered were income levels and the percentage of minority population.

The EPD Drinking Water Program also provided a list of non-municipal public water systems (having similar criteria to the municipal water systems) from their permitting data base. Based on knowledge of the systems, EPD selected and field-verified four non-municipal, rural, low-income, minority, ground water dependent water systems to participate in the project. The Drinking Water Program also assisted with the selection of the two surface water systems.

The majority of the water systems selected occur either in the mountains of north Georgia or in central Georgia along the Fall Line. A few of the water systems are in south Georgia, where most wells are in confined aquifers.

2.2 Priority Setting

Public water systems which already had approved wellhead protection plans were not considered for the project. Larger municipalities and recreational communities, not meeting the study's above-mentioned selection criteria, also were not considered. From the original list of sixty-eight potential systems, EPD field-verified approximately forty water systems. Field-verification involved visiting each water system/community to confirm their demographic and hydrogeologic characteristics to ensure that they conformed with the Project criteria.

Following the field verification phase, EPD further culled the list down to thirty public water systems, leaving more systems than necessary to meet the project's objectives, in anticipation that some of the systems might drop out due to community disinterest. EPD contacted the thirty public water systems by mail to introduce the program and solicit interest. If a system did not reply or responded negatively, EPD telephoned the owner/operater to ascertain the nature of their disinterest. Negative responses fell within three categories: (1) unknown costs involved in participating in the project; (2) notion that EPA/EPD would force the town to accept even greater operating costs in the future; or (3) possibility of infringement upon individual resident's property or privacy.

2.3 Public Water Systems Evaluated

Table 2-1 identifies the public water systems initially evaluated. If a "yes" occurs in any column, the water system was no longer considered. Column headings are explained below:

Confined Aquifer	The well for the water system draws ground water from a confined aquifer. Only unconfined aquifer systems meet project criteria.
Community's Request	The Community showed no interest in participating in the project.
Income Level	After further checking, the income level of the residents was higher than the systems finally chosen.
Non-Rural	After further checking, the community did not meet the rural setting criteria.
Water Supply	For any number of reasons, system did not meet criteria for type of water supply.

EPD Request	The Drinking Water Program requested that this water system not be included in the project.
Plan Complete	EPD already prepared the Wellhead Protection Plan.
Selected by Project	This system met all project criteria.

2.4 Public Water Systems Targeted

Table 2-2 summarizes selected characteristics of the 23 public water systems chosen for final participation in the project. A "yes" in a column, indicates that the water system possesses the indicated characteristic.

Table 2-1 Public Water Systems Initially Evaluated

Community	Confined Aquifer	Community's Request	Income Level	Non-Rural	Water Supply	EPD Request	Plan Complete	Selected by Project
Adairsville						Yes		
Adel	Yes						Yes	
Andersonville				Yes				
B&B	Yes							
Bainbridge				Yes				
Ball Ground							Yes	
Bartow							Yes	
Blairsville							Yes	
Brown Terrace								Accepted
Brown Well	Yes							
Buena Vista	Yes							
Byromville	Yes							
Calhoun						Yes		
Camak								Accepted
Cave Springs								Accepted
Cleveland							Yes	
Culloden								Accepted
Donaldsonville				Yes				
Eddie Daniels								Accepted
Ellijay								Accepted
Flying 'N'			Yes					
Geneva					Yes			
Greenville					Yes			
Hancock								Accepted
Harbor Club			Yes					
Harris County						Yes		
Jane Beaver					Yes			
Junction City	Yes						Yes	
Lafayette						Yes	Yes	
Landings S/D			Yes					
Little Neck							Yes	
Lone Oak								Accepted
Lumpkin							Yes	
Mamie					Yes			

Table 2-1 Public Water Systems Initially Evaluated (continued)

Community	Confined Aquifer	Community's Request	Income Level	Non-Rural	Water Supply	EPD Request	Plan Complete	Selected by Project
Manchester								Accepted
Martinez								Accepted
Martin Luther King								Accepted
Menlo								Accepted
Mineral Bluff								Accepted
Morganton								Accepted
Newton	Yes							
Nicholson	Yes							
North Ridge	Yes							
Parkersburg	Yes						Yes	
Parrot Water	Yes							
Pine Mt Valley								Accepted
Ridgewood							Yes	
Shiloh					Yes			
Siloam								Accepted
Smithville	Yes							
Spur 25							Yes	
Summersville							Yes	
Talbottom							Yes	
Tallulah Falls								Accepted
Thunderhill								Accepted
Ty Ty		Yes						
Valdosta				Yes				
Vidette	Yes							
Walker County							Yes	
Walnut Mountain			Yes					
Warm Springs								Accepted
Warthen							Yes	
Waverly Hall					Yes			
White Plains								Accepted
Woodbury								Accepted
Woodville								Accepted
Wrens		Yes						
Young Harris								Accepted
TOTALS: 68	**13**	**2**	**4**	**4**	**6**	**4**	**16**	**23**

Table 2-2 Characteristics of the Water Systems

	Demographics			Water Source	
Community	**Minority**	**Low Income**	**Rural**	**Ground Water**	**Surface Water**
Brown Terrace	Yes	Yes	Yes	Yes	
Camak	Yes	Yes	Yes	Yes	
Cave Springs		Yes	Yes	Yes	
Culloden	Yes	Yes	Yes	Yes	
Eddie Daniels	Yes	Yes		Yes	
Ellijay		Yes	Yes	Yes	
Hancock	Yes	Yes	Yes	Yes	
Lone Oak	Yes	Yes	Yes	Yes	
Manchester	Yes	Yes	Yes		Yes
Martinez		Yes		Yes	
Martin Luther King	Yes	Yes		Yes	
Menlo		Yes	Yes	Yes	
Mineral Bluff		Yes	Yes	Yes	
Morganton		Yes	Yes	Yes	
Pine Mt Valley	Yes	Yes	Yes	Yes	
Siloam	Yes	Yes	Yes	Yes	
Tallulah Falls		Yes	Yes	Yes	
Thunderhill		Yes	Yes	Yes	
Warm Springs		Yes	Yes	Yes	
White Plains	Yes	Yes	Yes	Yes	
Woodbury	Yes	Yes	Yes		Yes
Woodville	Yes	Yes	Yes	Yes	
Young Harris		Yes	Yes	Yes	
Totals: 23	**13**	**23**	**20**	**21**	**2**

3.0 SOURCE WATER PROTECTION AND POTENTIAL POLLUTION SOURCES

3.1 Delineation of Source Water Protection Areas

For all of the municipal and one of the non-municipal systems, delineation of the source water protection areas (also known as wellhead protection areas for ground water systems) for the ground water dependent systems used the same methodology as that used by EPD's Wellhead Protection Program. EPD associates consulted the water system files maintained by the Drinking Water Program to obtain the well/spring variables (gallons of water per minute, screened interval, and depth of well) necessary to complete the delineation. Well and spring locations were verified in the field with global positioning system (GPS) equipment. Using one of the methodologies listed below, EPD plotted the geometric sizes of the source water protection areas on topographic maps.

Generally, the source water protection areas for the non-municipal wells (other than Brown's Terrace), consisted of the property boundary of the water system owner and the adjoining properties, areas for which the owner could exercise some reasonable control. For the two surface water systems, the source water protection areas equated to the watershed drainage boundaries.

Karstic Areas

For water systems with wells or springs in Valley and Ridge karstic areas (located in the northwest portion of the State), an arbitrary two mile radius around each well served as the source water protection area

Piedmont and Blue Ridge

For municipal wells located in the Georgia Piedmont, EPD used a modified calculated fixed radius method to establish the management areas for wells and springs. The method selected is similar to one proposed by Richard Heath for wells located in the crystalline rocks of North Carolina's Piedmont and Blue Ridge Physiographic Provinces. In the case of springs, it is acknowledged that the flow rate of the springs rather than the quantity of water used by the system would be more appropriate, but determining such rates was beyond the scope of the project.

Coastal Plain

EPD used the EPA-recommended volumetric flow equation to determine the source water protection area for the Brown's Terrace water system (the only water system located in the unconfined Coastal Plain aquifer for the systems studied).

Surface Water

For the two systems utilizing surface water, Water Quality Critical Areas, as defined by the Georgia Department of Community Affairs (DCA), served as the source water protection areas. EPD depicted the watershed drainage boundary for each water system on USGS topographic maps, at a scale of 1:24,000.

Delineation Summary

Table 3-1 identifies the method of delineation used for each targeted water system.

3.2 Potential Pollution Source Inventory

The potential pollution source inventory presents basic information on past and present contamination sources located within the delineated source water protection areas. The inventories are incorporated into the Source Water Protection Plans to provide information for the municipality/water system/community to appropriately manage potential pollution sources which might impact the water quality of their wells/springs. Project associates, in conjunction with community volunteers (when and where available), conducted potential pollution source inventories for each of the targeted water systems.

As part of its Wellhead Protection Program, EPD previously developed a generalized inventory list of potential pollution sources. EPD used this inventory to identify potential pollution sources for this project. Examples of potential pollution sources include: commercial animal enclosures, gasoline service stations, above ground and underground storage tanks, abandoned wells, landfills, non-domestic septic systems, abandoned drums, and waste piles. The generalized inventory list of pollution sources is included as an appendix with each Source Water Protection Plan.

Table 3-1 Delineation Method of Targeted Water Systems

	Water Source			Delineation Method			
Community	*Spring*	*Well*	*Surface Water*	*Karst*	*Piedmont*	*Coastal Plain*	*Watershed*
Brown's Terrace		X				X	
Camak		X			X		
Cave Springs	X			X			
Culloden		X			X		
*Eddie Daniels***		X					
Ellijay	X	X	X		X		
Hancock		X			X		
Lone Oak		X			X		
Manchester			X				X
Martinez		X			X		
Martin Luther King		X		X			
Menlo		X		X			
*Mineral Bluff***			X				
Morganton		X	X		X		
Pine Mtn. Valley	X	X			X		
Siloam		X			X		
Tallulah Falls		X			X		
Thunderhill		X			X		
Warm Springs		X			X		
White Plains		X			X		
Woodbury			X				X
Woodville		X			X		
Young Harris		X			X		
TOTALS: 23	3	19	5	3	15	1	2

** Management zones were not delineated for these two water systems; reasons are provided in their respective source water protection plans.

4.0 VOLUNTEERS

Local Community Volunteers

Assistance provided by local community volunteers in the preparation of source water protection plans varied depending on the type of water system (non-municipal vs. municipal). In order to satisfy their concerns regarding biases of tenants or other outside volunteers, the non-municipal owners/operators served as the project volunteers in all but two instances (City of Martinez and Pine Mountain Valley). Six of the targeted municipal public water systems provided local community volunteers. Unfortunately many of these volunteers showed little interest in a continued relationship with their respective water systems. Although the volunteers did not actually prepare the potential pollution source inventories for their respective water systems, they did participate in the review process. A few of the volunteers agreed to help introduce the source water protection plans to their local government.

VISTA and RSVP Volunteers

The VISTA volunteer completed drafts for several source water protection plans. The volunteer had limited interaction with the water systems and will not be involved with these communities in the future since she moved away from Georgia. Two RSVP volunteers assisted with the preparation of the pollution source inventory and Source Water Protection Plan for the City of Young Harris.

Volunteer Summary

Table 4-1 summarizes the community involvement with the targeted public water systems. A summary of the level of participation experienced along with a brief description of each water system is presented in Section 5.0. Overall, EPD's experience with using non-EPD associates was negative. EPD had considerable difficulty in obtaining the VISTA volunteer, who resigned for personal reasons before the project was completed. RSVP and other volunteers had varying amounts of interest in the project and their effectiveness was minimal. Training and mentoring the volunteers was very time consuming because most of the individuals could not visualize ground-water flow and pollution pathways. Eventually, EPD associates had to complete all the source water protection plans for all the ground water and surface water systems.

Table 4-1 Community Involvement with the Targeted Water Systems

Community	Owner/ Operator Volunteer	Local Community Volunteer	VISTA/RSVP Volunteer	EPD Associate Only	Level of Community Involvement	Future Volunteer Involvement
Brown Terrace	Yes				High	Possible
Camak		Yes			Med	
Cave Springs		Yes			High	Possible
Culloden				Yes	Low	
Eddie Daniels				Yes	Low	
Ellijay				Yes	Low	
Hancock		Yes			Med	
Lone Oak				Yes	Low	
Manchester			Yes		Low	
Martinez				Yes	Low	
MLK	Yes				High	Possible
Menlo				Yes	Med	
Mineral Bluff				Yes	Low	
Morganton				Yes	Med	
Pine Mt Valley	Yes		Yes		Med	
Siloam		Yes			Med	
Tallulah Falls			Yes		High	
Thunderhill	Yes				Med	
Warm Springs			Yes		Low	
White Plains		Yes			High	Possible
Woodbury			Yes		Low	Possible
Woodville		Yes			Low	
Young Harris			Yes		Med	Possible
Total: 23	**4**	**6**	**6**	**8**		**6**

5.0 WATER SYSTEM DESCRIPTIONS

The water system descriptions are presented in alphabetical order. Each description contains a narrative on the type of community serviced by the water system, the geologic location of the city/town, and the level of source water protection interest exhibited by the water system owners/operators. An example of a source water protection plan with accompanying inventory is provided as an Appendix. The individual water systems and EPA received copies of each Source Water Protection Plan. EPD also maintains copies in project files at the Geologic Survey Branch.

BROWN'S TERRACE SUBDIVISION

This non-municipal ground water system services a low-income, rural, minority subdivision near Louisville, GA. The water system owner maintains the water system using experience gained managing federally owned water systems. The owner served as the volunteer and assisted with the preparation of the pollution source inventory. EPD associates provided technical assistance to the owner with respect to his operating permit.

CITY OF CAMAK

Camak is a rural, low-income, minority city in the eastern Piedmont of Georgia. This ground-water dependent, municipal water system provided four volunteers to assist in the completion of the potential pollution source inventory. Camak expressed their relief to have met the requirements of the EPD regarding source water protection, with no cost to themselves, but have not shown an interest in continued efforts.

CITY OF CAVE SPRINGS

Cave Springs, a rural, low-income, non-minority city, is located in the karstic terrane of Georgia's western Valley and Ridge. The city depends on Cave Spring for many of it's social and economic aspects, as well as its community ground water supply. The Director of the City of Cave Springs Water System, along with a community volunteer, assisted the EPD project associate with the preparation of the source water protection plan. After EPD completed the potential pollution source inventory and source water protection plan, the Water System Director and the volunteer reviewed the documents. Following their review, additional abandoned underground storage tanks were added to the inventory. The Water System Director and the volunteer agreed to present the source water protection plan to the city council. The volunteer hopes to continue working with the water system assisting them with source water protection issues.

CITY OF CULLODEN

Culloden is a rural, low-income, minority city in the western Piedmont of Georgia, dependent on ground water for their municipal water supply. The VISTA volunteer initiated the potential pollution source inventory for Culloden. After her departure, EPD associates revised the inventory and completed the remainder of the source water protection plan. Although Culloden has had ground water quality problems in recent years, resulting in the drilling of new wells, the city showed minimal interest in source water protection. During the time of the project, one of Culloden's wells was shut down due to poor water quality.

EDDIE DANIEL'S SUBDIVISION

The Eddie Daniels Subdivision is a minority-occupied, low-income development, located in the karstic terrane of Georgia's Coastal Plain, south of Cordele. The non-municipal water system is ground-water dependent. EPD's field work and file research revealed that this water system was not permitted, as is required by the State. The records indicated that in November 1988, EPD's Drinking Water Program notified the owner that he was operating an unpermitted water system. In December 1988, the owner notified his customers that the water system would cease supplying water on February 1, 1989. Apparently, the water system continued to operate until it was sold (date unknown). The new owner continued to operate the system without EPD's knowledge, until it changed ownership again in May, 1995. EPD's Drinking Water Program asked that project associates provide a report to them for enforcement purposes. The report resulted in an investigation of this water system by EPD's Southwest Regional Office. Actions currently under consideration by EPD include connection of the Eddie Daniels system to the City of Cordele public water system, issuing a permit to operate the Eddie Daniels system, or permanently closing the system.

CITY OF ELLIJAY

Ellijay, a rural, low-income, non-minority city in the northern Piedmont of Georgia, relies upon surface water and ground water for its municipal water supply. The expectations were that an RSVP volunteer would complete the potential pollution source inventory for Ellijay. However, due to the lack of RSVP volunteers, EPD associates completed the inventory and the source water protection plan. Ellijay primarily depends on surface water for its drinking water but requested that a source water protection plan also be prepared for their well and springs. Ellijay expressed their thanks to EPD for completing the plan, but has not indicated a need for future interaction.

HANCOCK COUNTY WATER SYSTEM

The Hancock County Water System, is a minority-owned, non-municipal public water system serving the rural, low-income, minority community of Mayfield, in Georgia's eastern Piedmont. The water system owner encouraged two individuals to volunteer to participate in the preparation of the potential pollution source inventory. This water system was the only targeted non-municipal system to express an interest in allowing residents to help in the development of the inventory. After the volunteers reviewed the source water protection plan, EPD revised the inventory. The water system owner has requested future assistance in finding funding to grout and plug one abandoned well.

CITY OF LONE OAK

Lone Oak is a rural, minority, low-income town located in Georgia's western Piedmont. The town operates a municipal public water system which is dependent on ground water. The VISTA volunteer initiated the potential pollution source inventory and source water protection plan. EPD associates revised the inventory and completed the final source water protection plan. Lone Oak has not expressed interest in continued source water protection planning.

CITY OF MANCHESTER

Manchester is a rural, minority, low-income, city situated in Georgia's western Piedmont. The city primarily depends upon a municipal, surface water system for their drinking water. The VISTA volunteer initiated the potential pollution source inventory and source water protection plan. EPD associates revised the inventory and completed the final source water protection plan. EPD chose Manchester for the project because its source water is provided both by surface water and ground water. Manchester was using their surface water source at the time of the study.

MARTINEZ WATER ASSOCIATION

Martinez is a non-minority town located in Georgia's eastern Piedmont, near Augusta. This non-municipal public water system, dependent upon ground water, exhibited little interest in the project or the source water protection plan. EPD associates completed the potential pollution source inventory and source water protection plan with no involvement from the water system. Little future interaction is expected.

MARTIN LUTHER KING, JR., MOBILE HOME PARK (MLK)

MLK is a minority, low-income mobile home park in the karstic terrane of Georgia's Coastal Plain, south of Cordele. A field reconnaissance of this non-municipal water system revealed septic system problems with several surface seepages of sewage within 60 feet of one of the systems' two wells. Since the City of Cordele bounds MLK on three sides it is difficult to consider this community as

being totally rural; however, the EPD Drinking Water Program requested that it be part of the project because of their continual compliance problems and the limited financial resources of the owner. In September 1994, the water system owners and EPD entered into a Consent Order requiring connection to the Cordele public water system. By March 1995, the connection still had not been made. A meeting was held on March 20, 1995 between the MLK water system owners and EPD. At that time EPD amended the Consent Order and the owners were again ordered to connect their residents to the Cordele water system. The owners of MLK are attempting to raise funds to construct new roads, a new water system, a new sewage system, and new housing to bring MLK into compliance with Cordele's subdivision ordinance. Consultants associated with Clark Atlanta University's Political Science Department are providing assistance to MLK's owners. EPD met with the consultants and provided them with available file information on the water system. Cordele has provided EPD with information regarding sewage and drinking water availability, and information on Cordele's past interactions with MLK's owners.

CITY OF MENLO

Menlo, a rural, low-income, non-minority town, is located in the karstic terrane of northwest Georgia's Valley and Ridge. The water system is dependent on ground water for its public drinking water supply. Menlo was an enthusiastic project participant. Menlo has had trouble maintaining the water quality in their wells due to the influence of surface water. Additionally, the City has encountered difficulties drilling productive wells. Since no volunteers were identified for this water system, EPD completed the potential pollution source inventory and source water protection plan.

CITY OF MINERAL BLUFF

Mineral Bluff, a rural, low-income, non-minority city in the northern Blue Ridge Province of Georgia, recently abandoned two municipal wells and currently buys its water from the City of Blue Ridge. EPD recommended to Mineral Bluff that they properly abandon their wells and agreed to assist Mineral Bluff in their search for a funding source.

CITY OF MORGANTON

Morganton, a rural, low-income, non-minority town, is situated in the northern Blue Ridge Province of Georgia. This municipal system relies upon ground water for its drinking water supply. In addition, Morganton is tied into the City of Blue Ridge's municipal water system. The expectations were that an RSVP volunteer would complete the potential pollution source inventory for Morganton. Unfortunately, there were no RSVP volunteers identified and EPD completed the inventory and source water protection plan. Morganton expressed their thanks to EPD for completing the source water protection plan for their wells. They did not indicate any future needs regarding their involvement in the program.

PINE MOUNTAIN VALLEY WATER ASSOCIATION, INC.

Pine Mountain Valley is a rural, low-income, non-minority, non-municipal public water supply system in Georgia's western Piedmont. The VISTA volunteer completed the potential pollution source inventory and the source water protection plan for this system. Pine Mountain Valley requested additional technical advice due to the mechanical degradation of the city's spring system. EPD's Drinking Water Program provided the necessary technical assistance to Pine Mountain Valley. Pine Mountain Valley expressed little interest in continued source water protection planning.

CITY OF SILOAM

Siloam is a rural, low-income, minority town in the eastern Piedmont of Georgia. Siloam, is serviced by a municipal water system, dependent on ground water. Siloam provided one volunteer, the mayor, who assisted with the potential pollution source inventory. Though the mayor was very interested, he had minimal time to assist the project associates. Therefore, it became necessary for EPD to complete the potential pollution source inventory and the source water protection plan. Siloam did not express an interest in continued efforts regarding source water protection.

CITY OF TALLULAH FALLS

Tallulah Falls is a low-income, rural, non-minority town located in the eastern Blue Ridge Province of Georgia. This municipal public water system, is serviced by two springs. A VISTA volunteer associated with the Tocca Falls Boys and Girls Club assisted EPD with the initiation of the potential pollution source inventory for the Tallulah Falls water system. EPD completed the final inventory and source water protection plan. Tallulah Falls expressed a desire for a continuing relationship with EPD to monitor several of the pollution sources listed in the inventory. Two private secondary schools, the Rabun Gap-Nacoochee School and the Tallulah Falls School, expressed interest in using students to assist with the completion of the pollution source inventory. Due to conflicts in schedules, however, no volunteers from either school were able to assist. These two schools expressed additional interest in having students and faculty members complete a potential pollution source inventory for the wells supplying their respective schools.

CITY OF WARM SPRINGS

Warm Springs is a rural, predominately low-income, city located in the western Piedmont of central Georgia. Warm Springs has a municipal ground- water supply system that serves a population of approximately 500 people. EPD associates completed the potential pollution source inventory and source water protection plan with little involvement from the water system. Little future interaction is expected.

CITY OF WHITE PLAINS

White Plains is a low-income, rural, minority town in Georgia's eastern Piedmont. This municipal water system is dependent upon ground water for their drinking water source. White Plains provided two senior citizen volunteers to assist in the completion of the potential pollution source inventory. Though the interest and participation of the volunteers was evident, the inventory and source water protection plan were eventually completed by EPD. The mayor of White Plains, who is a former U.S. Geological Survey hydrologist, reviewed the plan. While conducting the pollution source inventory, EPD located a potentially unpermitted waste disposal site, outside the delineated source water protection area. The EPD associate preparing the inventory reported the findings to the Hazardous Waste Branch for further investigation.

CITY OF WOODBURY

Woodbury is a rural, low-income, minority, town located in Georgia's western Piedmont. Woodbury's municipal drinking water supply needs are met by both surface water and ground water. The VISTA volunteer attempted to find local volunteers who would be willing to assist with the preparation of the potential pollution source inventory for Woodbury. However, none were found. The VISTA volunteer initiated the potential pollution source inventory and delineation of the source water protection area (also known as the water quality critical area) for Lake Meriwether (surface water source). EPD associates completed the inventory and source water protection plan. Woodbury expressed little interest in continued assistance with source water protection planning.

CITY OF WOODVILLE

Woodville is a low-income, rural, minority town in Georgia's eastern Piedmont. Woodville is a municipal ground water dependent water system. Two local volunteers assisted in the preparation of the potential pollution source inventory. EPD completed the final inventory and source water protection plan. Little future interaction is expected.

CITY OF YOUNG HARRIS

Young Harris, a rural, low-income, non-minority city, in the northern Blue Ridge region of Georgia, relies upon a municipal ground water system for its drinking water supply. EPD associates prepared the inventory and the source water protection plan. Once completed, an RSVP volunteer helped review the plan.

6.0 REGULATORY COMPLIANCE

Management Plans

Every Source Water Protection Plan included a section entitled Part 3: Management Plan. This section listed the responsibilities of EPD regarding source water protection. It also provided recommendations to the water system regarding management of each potential pollution source identified in the inventory. Phone numbers, included in the plan, facilitate reporting of pollution incidents or for obtaining additional information regarding potential sources of pollution. In each plan, EPD recommended that local communities adopt source water protection (wellhead protection) ordinances to discourage other sources from locating within the boundaries of the management areas.

Water System Compliance Summary

One of the objectives of the Source Water Protection Project was to determine if small water systems had a difficult time maintaining compliance with EPD's Safe Drinking Water Rules. After reviewing the files of the twenty-three targeted water systems, it appears that the percentage of maximum contaminant level (MCL) violations is similar for both this subset of water systems and the total population of community public water systems (1611 as of October 1995). The following table compares the population of community public water systems having MCL violations with the targeted public water systems with MCL violations through the period ending October 31, 1995:

	January 1, 1991-June 30, 1994		*July 1, 1994-October 31, 1995*	
Community Systems	*Systems with Violations*	*Percent of Systems w/ Violations*	*Systems with Violations*	*Percent of Systems w/ Violations*
Targeted (23)	3	14%	2	9%
Total Pop (1611)	*290*	*18%*	*144*	*9%*

As one can see from the information presented above, the targeted public water systems actually had fewer violations (exceedances of an MCL) than water systems, as a whole. According to the files, all of the MCL exceedances were for coliform bacteria.

The table presented below summarizes the violations, including MCLs, of the targeted public water systems through the period ending October 31, 1995. The table only includes those public water systems, where a violation was listed in EPD's Drinking Water files.

	January 1, 1991-June 30, 1994		July 1, 1994-October 31, 1995	
Community	***Date***	***Violation Type***	***Date***	***Violation Type***
Brown Terrace	3/1/91	Monitoring, Repeat Major, Coliform		
	4/1/91	Monitoring, Repeat Major, Coliform		
	5/1/93	Monitoring, Routine Major, Coliform		
Camak	6/1/94	Monitoring, Routine Major, Coliform		
Cave Springs	11/1/90	Monitoring, Regular, Coliform	7/1/94	MCL, Monthly, Coliform
	6/1/94	Monitoring, Routine Major, Coliform		
Culloden	1/1/93	Monitoring, Regular, Nitrate	7/1/94	Detect 1,2- DCE
	5/1/93	Monitoring, Repeat Major, Coliform		
Hancock	1/1/91	Monitoring, Repeat Minor, Coliform	11/1/94	Monitoring, Routine Minor, Coliform
			12/1/94	Monitoring, Routine Minor, Coliform
Lone Oak	11/1/89	Monitoring, Regular, Coliform		
	6/1/90	MCL, Average, Coliform		
	6/1/94	Monitoring, Routine Major, Coliform		
Manchester	9/1/92	MCL, Monthly, Coliform		
Martinez	8/1/93	Monitoring, Repeat Minor, Coliform		
MLK	6/1/90	Monitoring, Regular, Coliform		
	4/1/91	Monitoring, Routine Major, Coliform		
	3/1/92	Monitoring, Routine Major, Coliform		
	9/1/92	Monitoring, Routine Major, Coliform		
	1/1/93	Monitoring, Routine Major, Coliform		
	1/1/93	Monitoring, Regular, Nitrate		
	2/1/93	Monitoring, Routine Major, Coliform		
	5/1/93	Monitoring, Routine Major, Coliform		
	9/1/93	Monitoring, Routine Major, Coliform		
Menlo	12/1/89	MCL, Average, Coliform	7/1/94	Monitoring, Repeat Major, Coliform
	2/1/91	MCL, Acute, Coliform	7/1/94	Monitoring, Routine Minor, Coliform
Siloam	12/1/89	Monitoring, Regular, Coliform		
	11/1/90	Monitoring, Regular, Coliform		
Tallulah Falls	4/1/93	MCL, Monthly, Coliform	12/1/94	Monitoring, Routine Major, Coliform
	5/1/93	Monitoring, Routine Minor, Coliform		
Thunderhill	6/1/92	Monitoring, Routine Major, Coliform	7/1/94	Monitoring, Routine Major, Coliform
	12/1/92	Monitoring, Routine Major, Coliform	12/1/94	Monitoring, Routine Major, Coliform
	4/1/93	Monitoring, Routine Major, Coliform		
	7/1/93	Monitoring, Routine Major, Coliform		
	8/1/93	Monitoring, Routine Major, Coliform		
Woodbury	10/1/91	Monitoring, Routine Minor, Coliform		
	2/1/92	Monitoring, Routine Minor, Coliform		
	6/1/94	Monitoring, Routine Major, Coliform		
Totals	37 Violations		9 Violations	

The table presented above, indicates that the vast majority of violations involve coliform bacteria. For public water supply systems, coliform bacteria samples are normally required to be collected on a monthly basis. A routine major coliform monitoring violation indicates that the water system did not collect the required samples for that particular month. A routine minor coliform monitoring violation indicates that at least one of the required samples was not collected. In other words, major and minor monitoring violations, signify samples were not collected; it does not indicate that there is high coliform bacteria in the well or source water. On the other hand, if an MCL is exceeded, the water system is required to collect repeat samples in order to confirm the analytical results. A repeat major coliform monitoring violation means that the water system did not collect the required repeat samples. A repeat minor coliform monitoring violation signifies that the water system collected some but not all of the required repeat samples.

Recommendations for Decreasing Non-Compliance Problems

A review of the previous table, which list the monitoring and MCL exceedances for the targeted public water systems, indicates that the vast majority of the violations are a result of not submitting water samples. One recommendation for decreasing the monitoring violations might be to provide the system owners/operators with additional education regarding the necessity for proper monitoring, sampling and analyses.

EPD associates working on the AC&C project provided technical assistance to several of the targeted public water systems owners/operators. For example, EPD assisted the owner of Brown's Terrace water system fill out forms relating to his operating permit. EPD also provided technical assistance to the City of Mineral Bluff water system, regarding proper abandonment of two wells. Project associates also were able to direct water systems owners and operators to other available resources. Most of the owners/operators seemed comfortable approaching Project associates for information.

Another source of technical assistance, training, and regulation compliance for member water systems is the Georgia Rural Water Association (GRWA). The GRWA provides a variety of information and services designed to serve small, rural water systems serving less than 10,000 people. The GRWA in conjunction with their national association, has entered into a cooperative agreement with the USEPA to assist small water systems and rural communities in the design and implementation of ground water protection plans.

7.0 TRAINING AND COORDINATION OF VOLUNTEERS

EPD associates working on this grant began the process of integrating volunteers into the Project beginning October 1994. EPD pursued three groups of volunteers:

- A VISTA volunteer to recruit and supervise volunteers completing potential pollution source inventories.
- RSVP volunteers for each targeted public water system, where available, to complete the inventories, present source water protection plans to their respective communities, and encourage implementation of the plans.
- Other volunteers from the communities selected, where RSVP volunteers were not available.

Obtaining a VISTA volunteer took considerably more time than originally envisioned. Contributing factors included:

- The restructuring of the Corporation for National Service.
- The change of leadership for the Corporation for National Service in Georgia.
- The reorganization of ACTION into the Corporation for National Service.
- The time required by the Georgia State Office of the Corporation for National Service to recruit VISTA volunteers for the flood relief programs and to incorporate the Americorps program into their operations.
- The change of VISTA project selection decisions from state and regional offices to the national office and the reversal of that policy.

The necessary forms and applications were completed and submitted to the Corporation for National Service in October 1994. The Georgia State Office of the Corporation for National Service projected the arrival of a VISTA volunteer in November or December 1994, then January 1995, and then February 1995. The VISTA volunteer finally arrived in Atlanta, April 1995.

8.0 SUMMARY

EPD successfully met the two primary objectives of the Project; preparation of Source Water Protection Plans and utilization of volunteers to assist in development of potential pollution source inventories. The targeted public water systems and their residents were provided with Source Water Protection Plans at no cost to the communities. In addition, several of the targeted public water systems now have a small group of knowledgeable citizens who should be able to recognize potential pollution sources.

As a result of EPD's personal field visits to the water systems, the Southwest Georgia Regional Office initiated enforcement action with one non-municipal public water system (MLK mobile home park) found to be out of compliance. A second unpermitted public water system (Eddie Daniel's Subdivision) also was identified.

The EPA requested that the Integrated Source Water Protection Project complete Source Water Protection activities for a minimum of twenty public water systems. Activities completed as part of the Project include:

- Delineation of Source Water Protection Areas (Wellhead Protection for ground water systems, Water Quality Critical Areas for surface water systems).
- Completion of Potential Pollution Source Inventories.
- Preparation of Source Water Protection Plans.
- Provisions to assist in the implementation of Source Water Protection Plans.
- Comparison of the compliance problems of targeted public water systems to non-targeted public water systems.
- Demonstration of how various State of Georgia programs can work together to accomplish the goals of Georgia's Safe Drinking Water Act with respect to Source Water Protection for small, rural, low-income minority and non-minority communities.

The Integrated Source Water Protection Project completed the above goals for twenty-three municipal and non-municipal public water systems (as outlined in this report.) Field data collected and experience gained by the Project will assist future efforts in municipal and non-municipal Source Water Protection efforts. Table 8-1 summarizes the status of work associated with the targeted water supply systems.

Volunteers assisted in the plan development for 15 of the 23 water systems. None of the volunteers were able to complete a source water protection plan without substantial EPD involvement. Considerable effort was expended by EPD

to recruit and mentor the volunteers, for relatively low contributions to plan development. Based on this experience, EPD does not recommend depending on volunteers to develop source water protection plans in the future.

To assist minority water system owners and operators, inexpensive technical information and assistance is needed. EPD's new Customer Assistance Program can provide selected technical and regulatory assistance to citizens, the regulated community, and local governments through the use of a toll-free telephone number and the EPD Quarterly newsletter.

Table 8-1 Status of Work Associated with the Targeted Water Systems

Community	*PPSI Prepared*	***Plan Completed***	*Plan Delivered*	***Follow-up Assistance Requested***
Brown's Terrace	Yes	Yes	Yes	Yes
Camak	Yes	Yes	Yes	
Cave Springs	Yes	Yes	Yes	Yes
Culloden	Yes	Yes	Yes	
Eddie Daniels	Yes	Yes	Yes*	Yes**
Ellijay	Yes	Yes	Yes	
Hancock	Yes	Yes	Yes	Yes
Lone Oak	Yes	Yes	Yes	
Manchester	Yes	Yes	Yes	
Martinez	Yes	Yes	Yes	
Martin Luther King	Yes	Yes	Yes	Yes
Menlo	Yes	Yes	Yes	Yes
Mineral Bluff	Yes	Yes	Yes	Yes
Morganton	Yes	Yes	Yes	Yes
Pine Mtn. Valley	Yes	Yes	Yes	Yes
Siloam	Yes	Yes	Yes	
Tallulah Falls	Yes	Yes	Yes	Yes
Thunderhill	Yes	Yes	Yes	
Warm Springs	Yes	Yes	Yes	
White Plains	Yes	Yes	Yes	Yes
Woodbury	Yes	Yes	Yes	
Woodville	Yes	Yes	Yes	
Young Harris	Yes	Yes	Yes	
TOTALS	***23***	***23***	***23***	***11***

Note: PPSI = potential pollution source inventory.

* *Report forwarded to the EPD Drinking Water Program for enforcement.*

** *Follow-up completed with Southwest EPD Regional Office.*

APPENDIX

SOURCE WATER PROTECTION PLAN

GEORGIA WELLHEAD PROTECTION PLAN

for

CITY of YOUNG HARRIS

TOWNS COUNTY

Permit #2810001

Expiration Date: August 22, 2002

Field Survey By:	*Donald L. Shellenberger*	*Date: October 20 & 27, 1995*
Prepared By:	*Donald L. Shellenberger*	*Date: October 30, 1995*
Checked By:	*Susan L. Grunwald*	*Date: October 24, 1995*
Approved By:	Susan L Grunwald	*Date:* 11/6/95
Distribution:	*2 GGS Files; 1 WRMB;*	*1 Local Government*

SYSTEM INFORMATION

Water System:	Young Harris Water System
County:	Towns
System ID No.:	2810001
Expiration Date:	August 22, 2002
Number of Wells:	4
System Type:	municipal
Population:	601
Class:	2
Region:	5
Province:	Blue Ridge
Aquifer Type:	unconfined Blue Ridge
*Significant Recharge Area:**	no
*Pollution Susceptibility:**	lower susceptibility
Supplier:	City of Young Harris
Contact:	Dale Kuykendall
Title:	Manager
Address:	P. O. Box 122 Young Harris, Georgia 30582
Phone No.:	(706) 379-3171
WHPA Delineated:	October 19, 1995
PPSI Conducted:	October 20 and 27, 1995
Alternate Water Source:	The City of Young Harris water system consists of three active wells. In the event that one well were to become inoperable, the other wells would supply the city's water needs until a permanent solution could be developed and implemented.

*Hydrologic Atlas 18, Most Significant Ground-Water Recharge Areas of Georgia, Georgia Department of Natural Resources, Atlanta, 1989.

*Hydrologic Atlas 20, Ground-Water Pollution Susceptibility Map of Georgia, Georgia Department of Natural Resources, Atlanta, 1992.

Part 1: DELINEATING THE WELLHEAD PROTECTION AREA

see attached maps

Well #1

Location description:	**Located on U.S. Highway 76 (Main Street) .3 mile southwest of intersection with Georgia Highway 66.**
Longitude:	**83°50'58.6"W**
Latitude:	**34°55'48.4"N**
Quadrangle:	**Hiawassee**
Aquifer Type:	**unconfined Blue Ridge**
Delineation Method:	**Heath Method**
Pumping Rate:	**135 gpm**
Cement Pad:	**present**
Well House:	**present**
Fence:	**not present**
Locked Gate:	**not present**
Control Zone:	**15 foot radius**
Inner-Management Zone:	**250 foot radius**
Outer-Management Zone:	**2399 foot radius**

Well #2 ***(This is a dry well that has been delineated with a Management Zone radius of 250 feet)***

Location description:	**Located on Timberline Road, .7 mile from intersection with U.S. Highway 76.**
Longitude:	**83°50'23.0"W**
Latitude:	**34°56'45.1"N**
Quadrangle:	**Hiawassee**
Aquifer Type:	**unconfined Blue Ridge**
Delineation Method:	**Heath Method**
Pumping Rate:	**N/A**
Cement Pad:	**present**
Well House:	**present**
Fence:	**not present**
Locked Gate:	**not present**
Control Zone:	**15 foot radius**
Inner-Management Zone:	**250 foot radius**
Outer-Management Zone:	***Since this is a dry well, no Outer-Management Zone has been delineated.***

Well #3

Location description:	**Located in parking lot between Manget and Winship Hall dormitories at Young Harris College.**
Longitude:	**83°50'42.0"W**
Latitude:	**34°55'58.5"N**
Quadrangle:	**Hiawassee**
Aquifer Type:	**unconfined Blue Ridge**
Delineation Method:	**Heath Method**
Pumping Rate:	**85 gpm**
Cement Pad:	**present**
Well House:	**present**

Well #3 (cont.):

Fence:	not present
Locked Gate:	not present
Control Zone:	15 foot radius
Inner-Management Zone:	250 foot radius
Outer-Management Zone:	1903 foot radius

Well #4

Location description:	Located on Swanson Road, .4 mile west of U.S. Highway 76.
Longitude:	83°51'32.0"W
Latitude:	34°55'28.1"N
Quadrangle:	Hiawassee
Aquifer Type:	unconfined Blue Ridge
Delineation Method:	Heath Method
Pumping Rate:	225 gpm
Cement Pad:	present
Well House:	present
Fence:	not present
Locked Gate:	not present
Control Zone:	15 foot radius
Inner-Management Zone:	250 foot radius
Outer-Management Zone:	3097 foot radius

Part 2: POTENTIAL POLLUTION SOURCE PPS (PPSI)

(see APPENDIX A for reference of PPS Codes)

PPS #	PPS Code	Description
1.	O04	electrical transformers
2.	O07	utility poles
3.	T01	access and secondary roads
4.	T03	U.S. Highway 76
5.	T03	Georgia Highway 66
6.	S05	sewer lines
7.	M06	excavation activity
8.	F04	underground storage tank 83°50'56.5"W 34°55'53.0"N (topographic map) Address: Young Harris 76 Service Station Main Street Young Harris, Georgia 30582
9.	B10	gasoline station service bay 83°50'56.5"W 34°55'53.0"N (topographic map) Address: Young Harris 76 Service Station Main Street Young Harris, Georgia 30582

PPS #	PPS Code	Description
10.	O02	abandoned vehicles 83°50'56.5"W 34°55'53.0"N (topographic map) Address: Young Harris 76 Service Station Main Street Young Harris, Georgia 30582
11.	F04	abandoned underground storage tank 83°50'56.0"W 34°55'56.5"N (topographic map) Address: abandoned service station Main Street Young Harris, Georgia 30582
12.	F04	underground storage tank 83°51'03.0"W 34°55'42.5"N (topographic map) Address: Blue Ridge Mountain EMC Main Street Young Harris, Georgia 30582
13.	B09	fleet service facility 83°51'03.0"W 34°55'42.5"N (topographic map) Address: Blue Ridge Mountain EMC Main Street Young Harris, Georgia 30582
14.	O04	electrical transformer storage 83°51'03.0"W 34°55'42.5"N (topographic map) Address: Blue Ridge Mountain EMC Main Street Young Harris, Georgia 30582
15.	F04	abandoned underground storage tank 83°51'06.0"W 34°55'31.0"N (topographic map) Address: Hi Tech Electronics Main Street Young Harris, Georgia 30582
16.	O03	cemetery 83°51'05.0"W 34°55'22.5"N (topographic map) Address: Old Union Baptist Church Old Union Church Road Young Harris, Georgia 30582
17.	F04	underground storage tank 83°51'31.5"W 34°55'03.5"N (topographic map) Address: Convenience Store U.S. Highway 76 Young Harris, Georgia 30582
18.	B03	truck dealer 83°51'33.5"W 34°55'00.0"N (topographic map) Address: Young Harris Truck Sales Inc. U.S. Highway 76 Young Harris, Georgia 30582
19.	O08	vehicle parking located at all commercial, governmental and educational establishments in the management zones
20.	S03	non-domestic septic systems in management zones for wells #1 and #4 which fall south of the Young Harris city limits

PPS #	PPS Code	Description
21.	S01	domestic septic systems in management zones for wells #1 and #4 which fall south of the Young Harris city limits
22.	A10	pasture
23.	A01	agricultural fields
24.	W06	garbage transfer stations at most commercial establishments in the management zones
25.	B09	fleet service facility 83°50'37.0"W 34°56'01.5"N (topographic map) Address: Young Harris College Sunset Drive at Thomastown Road Young Harris, Georgia 30582
*	F04	abandoned underground storage tank 83°51'46.5"W 34°54'56.5"N (topographic map) Address: Jacksonville Junction General Store U.S. Highway 76 Young Harris, Georgia 30582 *this UST is located just south of the southern boundary of the Outer-Management Zone for Well #4.*

Well #1
Control Zone:
15 foot radius

No pollution sources

Inner-Management Zone:
250 foot radius

PPS #	PPS Code	Description
1.	O04	electrical transformers
2.	O07	utility poles
4.	T03	U.S. Highway 76
6.	S05	sewer lines
7.	M06	excavation activity

Outer-Management Zone:
2399 foot radius

Note: PPS's 1, 2, 4, 6, and 7 are also found in the Outer-Management Zone.

PPS #	PPS Code	Description
3.	T01	access and secondary roads
5.	T03	Georgia Highway 66
8.	F04	underground storage tank
9.	B10	gasoline station service bay
10.	O02	abandoned vehicles
11.	F04	abandoned underground storage tank
12.	F04	underground storage tank
13.	B09	fleet service facility

PPS #	PPS Code	Description
14.	O04	electrical transformer storage
15.	F04	abandoned underground storage tank
16.	O03	cemetery
19.	O08	vehicle parking
20.	S03	non-domestic septic systems
21.	S01	domestic septic systems
22.	A10	pasture
23.	A01	agricultural fields
24.	W06	garbage transfer stations
25.	B09	fleet service facility

Well #2
Control Zone:
15 foot radius

No pollution sources

***Inner-Management Zone*:**
250 foot radius

PPS #	PPS Code	Description
1.	O04	electrical transformers
2.	O07	utility poles
3.	T01	access and secondary roads

Outer-Management Zone:
Since Well #2 is dry, no Outer-Management Zone has been delineated.

Well #3
Control Zone:
15 foot radius

PPS#	PPS Code	Description
19.	O08	vehicle parking

***Inner-Management Zone*:**
250 foot radius

Note: PPS #19 is also located in the Inner-Management Zone.

PPS #	PPS Code	Description
1.	O04	electrical transformers
2.	O07	utility poles
3.	T01	access and secondary roads
6.	S05	sewer lines
24.	W06	garbage transfer station

Outer-Management Zone:
1903 foot radius

Note: PPS's 1, 2, 3, 6, 19, and 24 are also found in the Outer-Management Zone.

PPS #	PPS Code	Description
4.	T03	U.S. Highway 76
5.	T03	Georgia Highway 66
7.	M06	excavation activity
8.	F04	underground storage tank
9.	B10	gasoline station service bay
10.	O02	abandoned vehicles
11.	F04	abandoned underground storage tank
22.	A10	pasture
23.	A01	agricultural fields
25.	B09	fleet service facility

Well #4
Control Zone:
15 foot radius

No pollution sources

Inner-Management Zone:
250 foot radius

PPS #	PPS Code	Description
1.	O04	electrical transformers
2.	O07	utility poles
3.	T01	access and secondary roads
21.	S01	domestic septic systems
22.	A10	pasture

Outer-Management Zone:
3097 foot radius

Note: PPS's 1, 2, 3, 21, and 22 are also found in the Outer-Management Zone.

PPS #	PPS Code	Description
4.	T03	U.S. Highway 76
6.	S05	sewer lines
12.	F04	underground storage tank
13.	B09	fleet service facility
14.	O04	electrical transformer storage
15.	F04	abandoned underground storage tank
16.	O03	cemetery
17.	F04	underground storage tank
18.	B03	truck dealer
19.	O08	vehicle parking
20.	S03	non-domestic septic systems
23.	A01	agricultural fields
24.	W06	garbage transfer stations
*	F04	abandoned underground storage tank

Part 3: MANAGEMENT PLAN

Local Wellhead Protection Ordinance
No

Responsibilities of the Georgia Environmental Protection Division (EPD)
Within the Inner and Outer Management Zones EPD shall:

- **not issue any new permits for municipal solid waste, industrial waste and construction/demolition waste landfills;**
- **not issue any new permits for the land disposal of hazardous wastes;**
- **require all new facilities permitted to handle, treat, store or dispose of hazardous waste or hazardous materials perform such operations on an impermeable pad having a spill and leak collection system;**
- **require all new agricultural waste impoundments have an impermeable synthetic liner;**
- **not issue any new permits for land application of waste water or sludge;**
- **not issue any new permits for underground injection wells;**
- **not issue permits for any new quarries or underground mines unless a hydrogeological investigation is completed;**
- **require all new underground storage tanks meet the highest standards applicable under the UST Act; and,**
- **require all new waste water treatment basins to have an impermeable synthetic liner.**

Recommendations to Local Governments from the Georgia Environmental Protection Division (EPD)

PPS #1. **PPS code O04 electrical transformers**

The City of Young Harris should periodically check electrical transformers for cracks and leaks in the event of accidental or storm damage.

PPS #2. **PPS code O07 utility poles**

The City of Young Harris should be aware that telephone and utility poles are treated with coal tar creosote or other wood preservatives.

PPS #3. **PPS code T01 access and secondary roads**

The City of Young Harris should report all hazardous waste or petroleum product spills and releases occurring within the wellhead protection area to the Department of Natural Resources at 1-800-241-4133.

PPS #4. **PPS code T03 U.S. Highway 76**

The City of Young Harris should report all hazardous waste or petroleum product spills and releases occurring within the wellhead protection area to the Department of Natural Resources at 1-800-241-4133.

PPS #5. **PPS code T03 Georgia Highway 66**

The City of Young Harris should report all hazardous waste or petroleum product spills and releases occurring within the wellhead protection area to the Department of Natural Resources at 1-800-241-4133.

Recommendations to Local Governments from the Georgia Environmental Protection Division (EPD)

PPS #6. PPS code S05 sewer lines

The City of Young Harris should properly maintain sewer lines and repair all sewer line breaks and leaks.

PPS #7. PPS code M06 excavation activity

The City of Young Harris should recommend owners employ best management practices in the operation of their businesses. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive SW, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #8. PPS code F04 underground storage tank

The City of Young Harris should recommend owners of underground storage tanks adhere to the Rules of Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-15 - Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources, Environmental Protection Division, Underground Storage Tank Program, (404) 362-2687.

PPS #9. PPS code B10 gasoline station service bay

The City of Young Harris should recommend owners adhere to best management practices in the operation of their gasoline station service bays. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive SW, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #10. PPS code O02 abandoned vehicles

The City of Young Harris should request that owners properly dispose of abandoned vehicles. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive SW, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #11. PPS code F04 abandoned underground storage tank

The City of Young Harris should recommend owners of underground storage tanks adhere to the Rules of Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-15 - Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources, Environmental Protection Division, Underground Storage Tank Program, (404) 362-2687.

PPS #12. PPS code F04 underground storage tank

The City of Young Harris should recommend owners of underground storage tanks adhere to the Rules of Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-15 - Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources, Environmental Protection Division, Underground Storage Tank Program, (404) 362-2687.

Recommendations to Local Governments from the Georgia Environmental Protection Division (EPD)

PPS #13. **PPS code B09 fleet service facility**

The City of Young Harris should recommend owners of fleet service facilities adhere to best management practices in the operation of their businesses. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive SW, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #14. **PPS code O04 electrical transformer storage**

The City of Young Harris should ensure that electrical transformer storage be conducted using best management practices to prevent possible ground-water contamination.

PPS #15. **PPS code F04 abandoned underground storage tank**

The City of Young Harris should recommend owners of underground storage tanks adhere to the Rules of Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-15 - Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources, Environmental Protection Division, Underground Storage Tank Program, (404) 362-2687.

PPS #16. **PPS code O03 cemetery**

The City of Young Harris should recommend the cemetery use best management practices when applying herbicides, pesticides or fertilizers on the cemetery grounds.

PPS #17. **PPS code F04 underground storage tank**

The City of Young Harris should recommend owners of underground storage tanks adhere to the Rules of Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-15 - Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources, Environmental Protection Division, Underground Storage Tank Program, (404) 362-2687.

PPS #18. **PPS code B03 truck dealer**

The City of Young Harris should request business owners employ best management practices in the operation of their businesses. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive SW, Suite 643, Atlanta, Georgia 30334 (404) 656-4934.

PPS #19. **PPS code O08 vehicle parking**

The City of Young Harris should recommend property owners restrict vehicle parking to designated paved areas where available.

PPS #20. **PPS code S03 non-domestic septic systems**

The City of Young Harris should recommend property owners properly utilize and maintain their non-domestic septic systems. Contact the Towns County Health Department for more information concerning proper septic tank maintenance and operation.

PPS #21. **PPS code S01 domestic septic systems**

The City of Young Harris should recommend property owners properly utilize and maintain their domestic septic systems. Contact the Towns County Health Department for more information concerning proper septic tank maintenance and operation.

Recommendations to Local Governments from the Georgia Environmental Protection Division (EPD)

PPS #22. **PPS code A10 pasture**

The City of Young Harris should request that owners employ best management practices in the operation of their pastures. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive SW, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #23. **PPS code A01 agricultural fields**

The City of Young Harris should request that owners employ best management practices in the operation of their agricultural fields. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive SW, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #24. **PPS code W06 garbage transfer stations**

The City of Young Harris should request that owners employ best management practices in the operation of their garbage transfer station. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive SW, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #25. **PPS code B09 fleet service facility**

The City of Young Harris should recommend owners of fleet service facilities adhere to best management practices in the operation of their businesses. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive SW, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

* **PPS code F04 abandoned underground storage tank**

The City of Young Harris should recommend owners of underground storage tanks adhere to the Rules of Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-15 - Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources, Environmental Protection Division, Underground Storage Tank Program, (404) 362-2687.

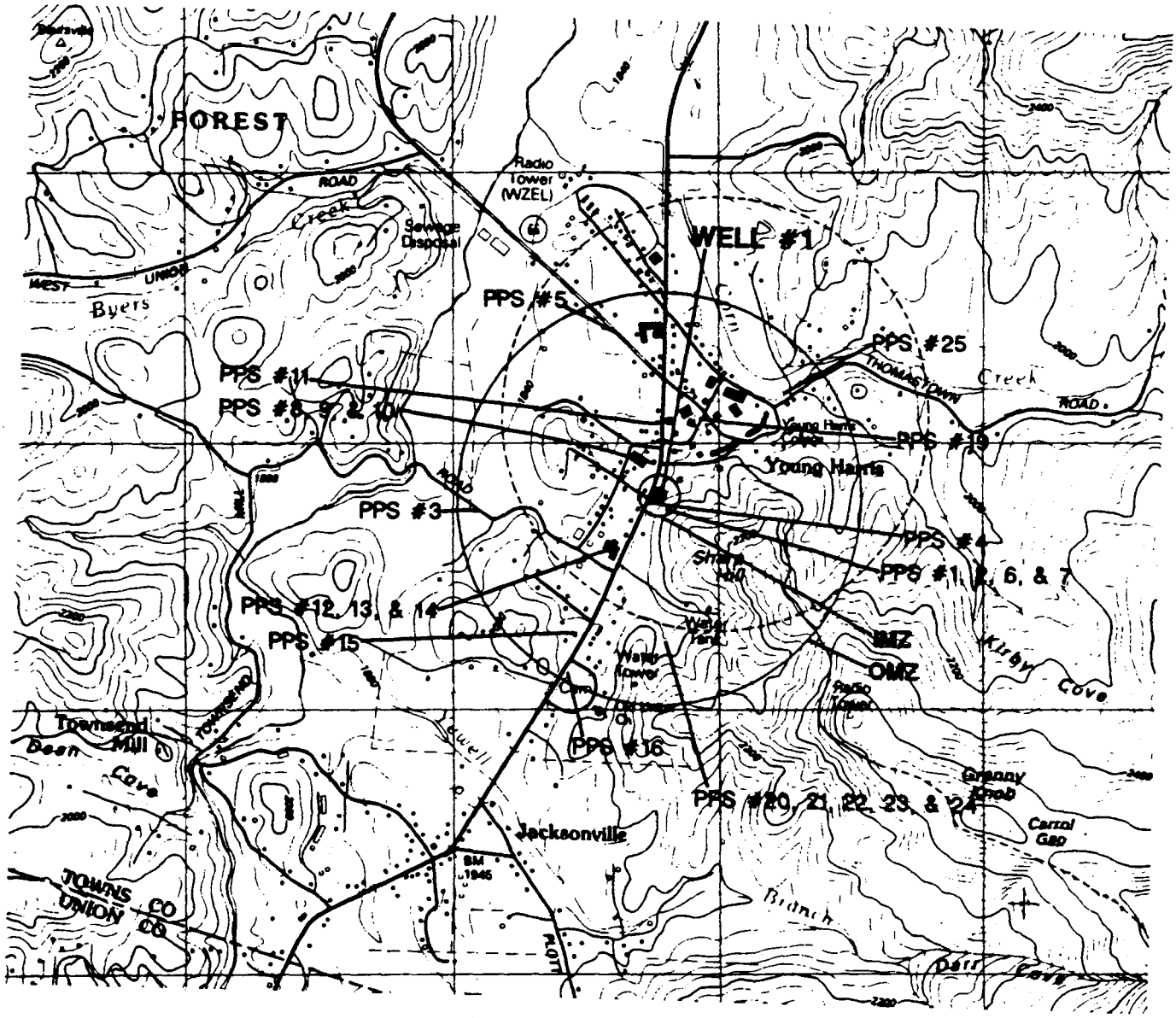
General Recommendations

- **The Control Zone should be protected from uses other than those directly dealing with the care and maintenance of the well.**
- **The Control Zone should be enclosed by a fence to limit access to the well.**
- **Access to the Control Zone should only be through a locking gate (or equivalent).**
- **Only those chemicals used for water treatment should be stored in the Control Zone; motor fuels, oil, motor vehicles or portable equipment powered by an internal combustion engine should not be stored in the Control Zone.**
- **Auxiliary power on site fuel storage should have a spill containment system for the entire volume of fuel.**
- **Wellhead Protection Areas should be protected from future potential pollution sources.**
- **The City of Young Harris should post a notice in a public place notifying residents that a Wellhead Protection Plan is available for review.**

Part 4: CONTINGENCY PLAN

The City of Young Harris water system consists of three active wells. In the event that one well were to become inoperable, the other wells would supply the city's water needs until a permanent solution could be developed and implemented.

CITY OF YOUNG HARRIS
WELL #1
WELLHEAD PROTECTION AREA

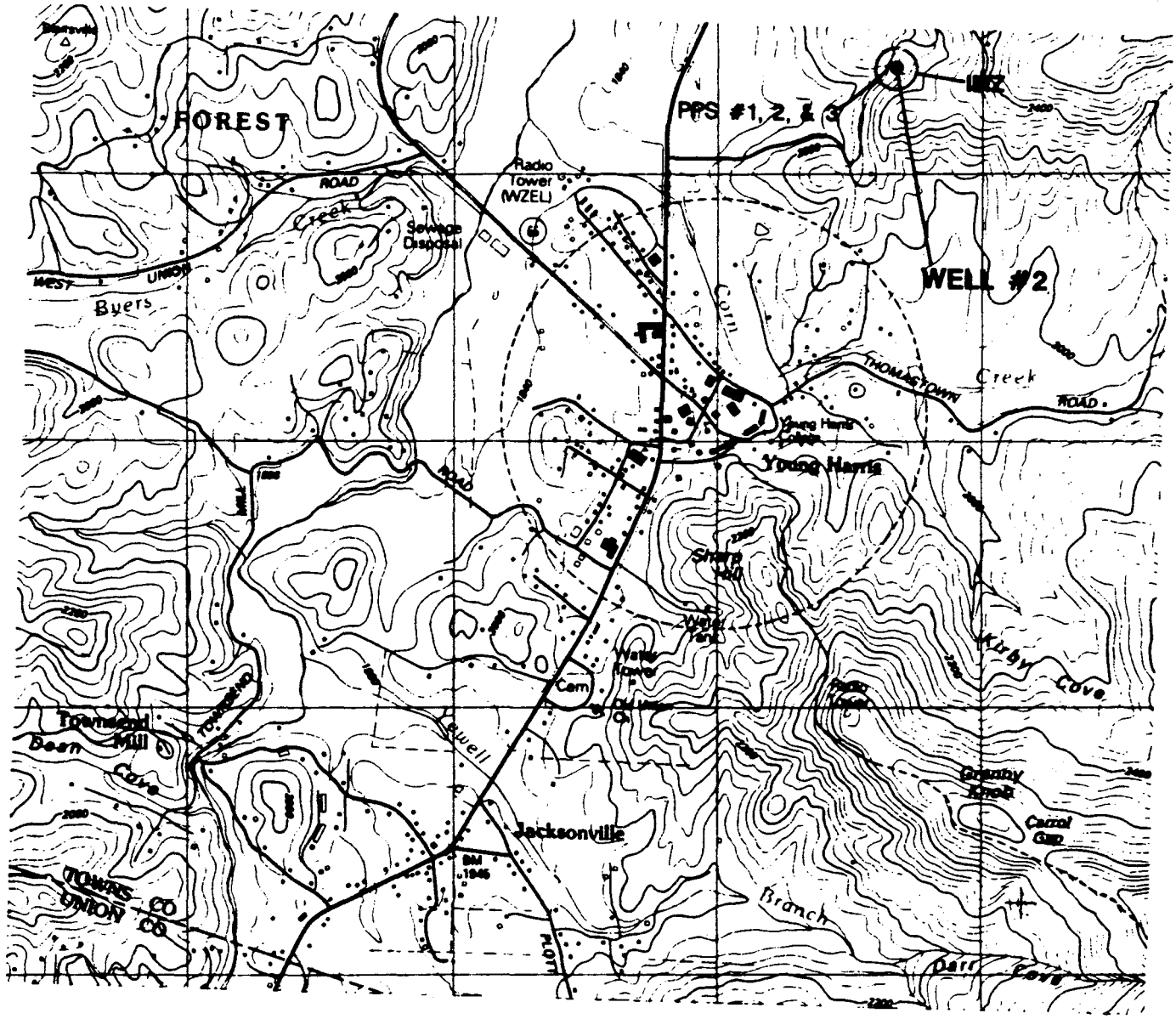


Quadrangle: **Hiawassee**
Longitude: 83°50'58.6"W
Latitude: 34°55'48.4"N
Control Zone: 15 foot radius
Inner-Management Zone: 250 foot radius
Outer-Management Zone: 2399 foot radius

Potential Pollution Sources PPS

PPS #1-16, 19-25 are listed on Pages 5 and 6.

CITY OF YOUNG HARRIS
WELL #2
WELLHEAD PROTECTION AREA

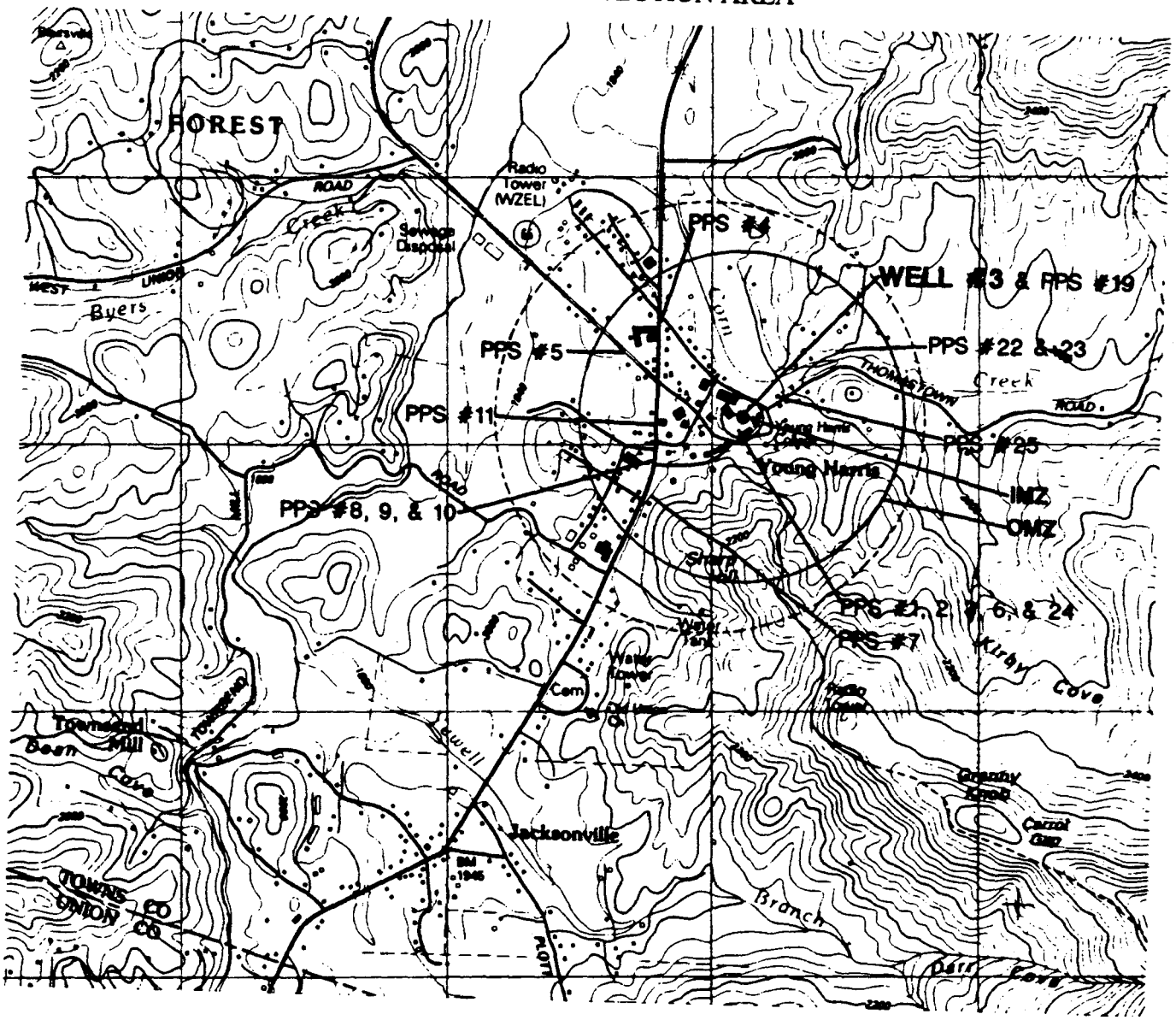


Quadrangle: **Hiawassee**
Longitude: 83°50'23.0"W
Latitude: 34°56'45.1"N
Control Zone: 15 foot radius
Inner-Management Zone: 250 foot radius
Outer-Management Zone: since this is a dry well, no Outer-Management Zone has been delineated.

Potential Pollution Sources PPS

PPS #1-electrical transformers
PPS #2-utility poles
PPS #3-access & secondary roads

CITY OF YOUNG HARRIS
WELL #3
WELLHEAD PROTECTION AREA

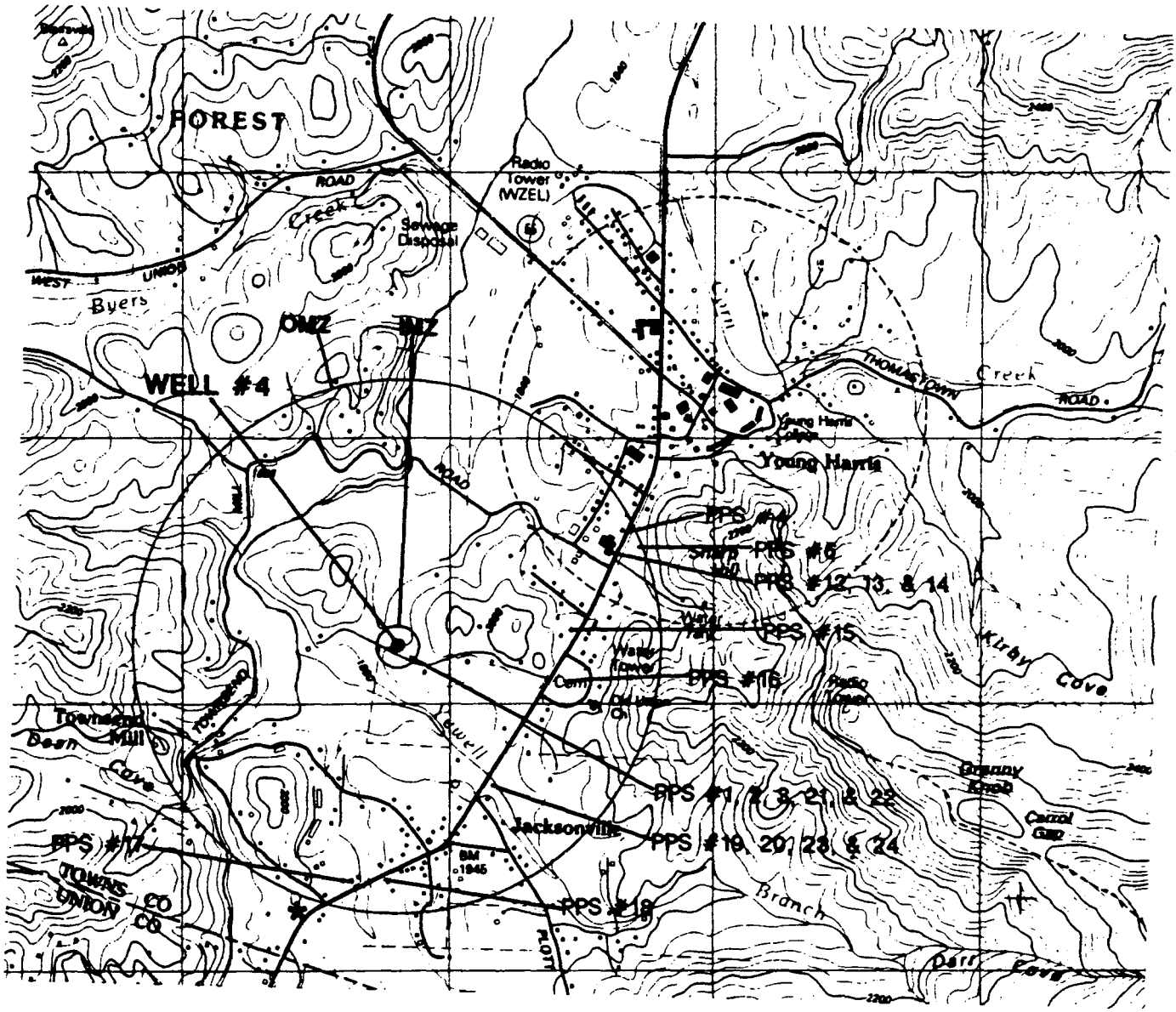


Quadrangle: **Hiawassee**
Longitude: 83°50'42.0"W
Latitude: 34°55'58.5"N
Control Zone: 15 foot radius
Inner-Management Zone: 250 foot radius
Outer-Management Zone: 1903 foot radius

Potential Pollution Sources PPS

PPS #1-11, 19, 22-25 are listed on Pages 6 and 7.

CITY OF YOUNG HARRIS
WELL #4
WELLHEAD PROTECTION AREA



Quadrangle: **Hiawassee**
Longitude: 83°51'32.0"W
Latitude: 34°55'28.1"N
Control Zone: 15 foot radius
Inner-Management Zone: 250 foot radius
Outer-Management Zone: 3097 foot radius

Potential Pollution Sources PPS

PPS #1-4, 6, 12-24 are listed on Page 7.
*denotes abandoned underground storage tank outside Outer-Management Zone.

APPENDIX A
INVENTORY OF POTENTIAL POLLUTION SOURCES

AGRICULTURE
A01 Agricultural Fields
A02 Agriculture Waste Impoundments
A03 Animal Burials
A04 Animal Feed Lots
A05 Commercial Animal Enclosures
A06 Fertilizer/Pesticide Storage
A07 Grain Storage Bins
A08 Irrigation Wells
A09 Pesticide Mixing Areas
A10 Other

BUSINESS AND INDUSTRY
B01 Asphalt Plant
B02 Auto Repair/Body Shop/Salvage Washes
B03 Auto/Truck/Boat/Equipment Dealers
B04 Business using Solvents/Paints
B05 Car Wash
B06 Chemical Production/Mixing/Storage
B07 Deicing Applications
B08 Electroplaters/Metal Finishers
B09 Fleet Service Facility
B10 Gasoline Station Service Bay
B11 Golf Courses/Nurseries
B12 Industrial Facilities
B13 Laundromats/Dry Cleaners
B14 Machine Shops
B15 Photo Processors
B16 Power Generating Facilities
B17 Printers
B18 Refineries
B19 Refinishing
B20 Salvage Operations
B21 Stockpiles
B22 Wood Chemical Treatment Facilities
B23 Other Industrial Facilities

FUEL STORAGE
F01 Above Ground Storage Tanks
F02 Fuel Storage Facility
F03 Oil/Gas Pipeline
F04 Underground Storage Tanks
F05 Other

HAZARDOUS MATERIALS
H01 Facilities Handling Hazardous Waste
H02 Hazardous Waste Disposal
H03 Hazardous Waste Management Units
H04 Radioactive Disposal and Storage
H05 Other

INJECTION AND INFILTRATION
I01 Abandoned Wells
I02 Domestic Wells
I03 Drainage Canals
I04 Holding Pond/Lagoon
I05 Infiltration Galleries
I06 Injection Wells
I07 Neighboring Polluted Wells
I08 Salt Water Intrusion/Upconing
I09 Sinkholes Modified/Natural
I10 Storm Water Runoff/Infiltration
I11 Swamps/Wetlands/Flood plain
I12 Urban Runoff
I13 Other

KNOWN POLLUTION
P01 Accident Spill Locations
P02 Hazardous Waste Sites
P03 Other

LANDFILLS
L01 Construction Waste Landfills
L02 Industrial Waste Landfills
L03 Municipal Solid Waste Landfills
L04 Others, Active or Abandoned

MINING AND CONSTRUCTION
M01 Borrow Pits
M02 Construction Excavations
M03 Detonation Sites
M04 Mining Operations
M05 Quarries/Underground Mines
M06 Other

SEWAGE AND WATER TREATMENT
S01 Domestic Septic Systems
S02 Lift Station
S03 Non-Domestic Septic Systems
S04 Sewage Treatment Plant
S05 Sewer Lines
S06 Treatment Lagoons/Ponds
S07 Waste Water Treatment Basin
S08 Water Treatment Facilities
S09 Other

TRANSPORTATION
T01 Access and Secondary Roads
T02 Airports
T03 Major Highways and Railroads
T04 Transportation Corridors
T05 Other

WASTE DISPOSAL SITES
W01 Abandoned Disposal Site
W02 Abandoned Drums
W03 Cesspools
W04 Drum Storage/Disposal/Recycling
W05 Dumps
W06 Garbage Transfer Stations
W07 Land Application Systems
W08 Open Pit Burning
W09 Recycling Facilities
W10 Sludge Application
W11 Sludge Producing Facility
W12 Waste Piles
W13 Other

OTHER
O01 Atmospheric Pollution Percolation
O02 Abandoned Cars/Vehicles
O03 Cemeteries
O04 Electrical Transformers
O05 Military Base/Depot
O06 Utility Corridors
O07 Utility Poles
O08 Vehicle Parking Areas
O09 Other