Montana Bureau of Mines and Geology

Open-File Report

Victor School
Victor, Montana
Source-Water Protection Plan

MBMG 399E

by
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Camela Carstarphen

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Public Water Supply #2134

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July 1999

ACKNOWLEDGMENTS

This source-water protection plan was completed by Nathan Beckwith, high school science teacher at the Victor School, Joe Meek of the Department of Environmental Quality, and Ginette Abdo and Camela Carstarphen of the Montana Bureau of Mines and Geology.

PURPOSE

To meet the requirements of the Safe Drinking Water Act (SDWA) as amended, Montana has implemented a source-water protection program in which each community submits a plan for certification review following a format prescribed by the Department of Environmental Quality (DEQ).

This report is intended to meet the technical requirements for the completion of the source water protection plan for the Victor School in Victor Montana as required by the SDWA.

A source-water protection plan is designed to protect community ground-water supplies from contamination. The plan establishes protection areas around the wellhead that extend upgradient a prescribed distance. The areal extent of the upgradient protection region is typically determined by modeling the aquifer and by projecting the well's capture zone as determined for three, five, and ten-year scenarios. The source-water protection region is then inventoried to identify potential contaminant sources. Management of the potential contaminant sources is considered and priorities are established. This long-term planning is necessary to provide an early warning mechanism in the event of upgradient contamination; however, preventing the contamination of a water supply through education and public awareness remains the primary goal.

Most instances of aquifer contamination become known when trace levels of a contaminant are detected through routine monitoring. Drinking-water systems that have completed a source-water protection plan will have information on ground-water flow and aquifer characteristics as well as a contaminant source inventory and thus will be in a good position to determine the best response to ensure the continued quality of the water supply.

CHAPTER 1
INTRODUCTION

The Community

Victor is located in western Montana, approximately 36 miles south of Missoula. The town has a population of about 500 and is located in the Bitterroot Valley along Highway 93 (figure 1). The town is centered around an area several blocks deep and 4 blocks long in which there are only services: four restaurants, a dime store, two bars, post office, two gas stations and a grocery store (currently there are several new businesses under construction). The town has been connected to a sewer system since 1977. The wastewater treatment facility is an aeration-type secondary treatment plant, with percolation ponds used for final effluent disposal (Morrison-Maierle, Inc, 1977). Victor's residential development has mostly spread westward towards the Bitterroot Mountains.

Victor's economy is an intricate part of the whole Bitterroot Valley economy. Currently, the valley's economic base is fairly varied. Forestry and other agriculture have been the historical employment base for the entire valley; however, the service industry and "population-support" industries have taken an increasingly dominant role. Agriculture is supported by irrigation water from a canal and ditch system that covers the entire valley. The water sources for this system are the Bitterroot River, and several reservoirs located in the glaciated valleys of the Bitterroot Mountains and a few small reservoirs in the Sapphire Mountains. Crops range from wheat to alfalfa with some areas in the valley bottom growing mint. In the early 1900's the area was a major producer of apples but very few orchards are still in existence or production.

The Bitterroot Valley offers world-class fisheries and hunting as well as access to a large wilderness complex, the Selway-Bitterroot Wilderness. This wilderness offers the day or weekend visitor rock-climbing opportunities and well-maintained trails up each glaciated canyon. These recreational opportunities have made the valley a major destination spot for summer vacationers as well as locals from the surrounding areas looking for a weekend or day trip. This influx of people on a daily and seasonal basis is a major contribution to the local economy as well as an additional stress to resources and a challenge to modern resource management. This is a reality for all the small communities in the Bitterroot, including Victor.

Victor School

The first Victor School was located at the west end of Main Street in a small building constructed of logs and a sod roof around 1880. In 1881, a teacher from Missouri was hired and in 1883 a new building was erected in a new location on Martin Street. As the population grew, three rural districts were defined by 1890: Victor with 95 students, Fairview with 27 students, and Pleasant View with 48 students. In 1896, a new schoolhouse was erected on the site of the present day school. This building was added onto in 1909 but later demolished in 1963. In 1964 a new building was erected and now serves as the original core of the main building with a 1975 extension on the east side serving as a gymnasium. Additional student growth has resulted in a new, small one-story building located across from the main building. Current student population is 380 students and 35 staff members. During the summer, the population drops to approximately 12

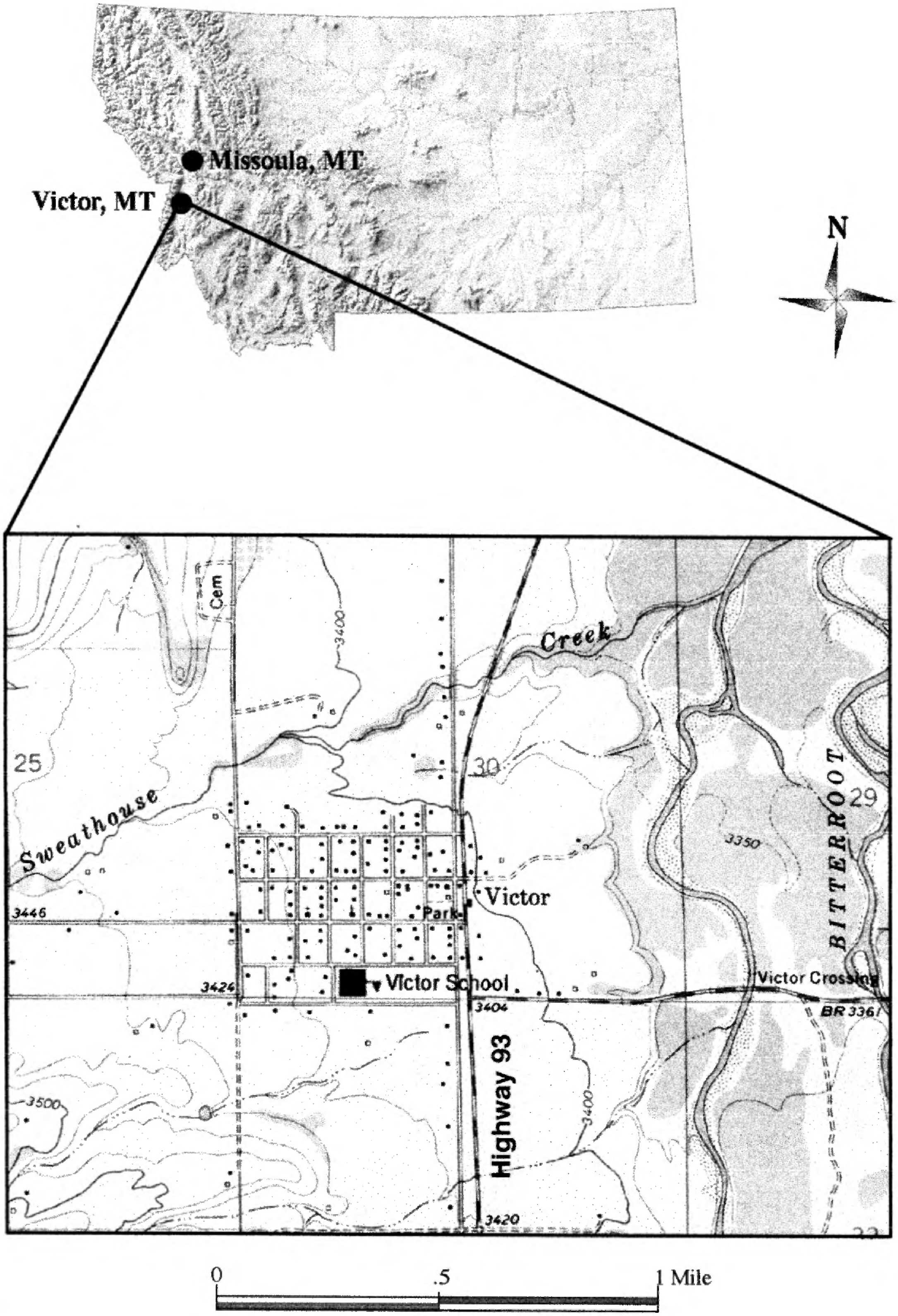


Figure 1. Location of Victor, Montana, with inset showing the location of the school.

12 individuals present at the school at any one time. Historically, student population has had peaks and valleys, although the overall trend has been upward. It is reasonable to expect an overall increase of 15-20 students every couple of years.

Geographic setting

The Bitterroot Valley is long and narrow, stretching from just south of Missoula to a point south of Darby, coinciding with the confluence of the East Fork and the West Fork of the Bitterroot River. Victor is located in the central portion of the Bitterroot Valley (figure 1). The Bitterroot River flows northwards towards Missoula where it joins the Clark Fork River. The valley length is 60 miles, and its width varies averaging about five miles. Near Victor, the valley is about nine miles wide. The valley comprises a rolling, heavily dissected terrain. The Bitterroot Mountains border the valley on the west and the Sapphire Mountains form a more subdued eastern boundary.

In the Victor area, the valley floor is approximately 3500 feet above sea level. The Sapphire Mountains reach an elevation of about 8000 feet above sea level. Some of the knife-edged ridges between the canyons in the Bitterroot Mountains reach an elevation of 8800 feet above sea level. The Bitterroot Valley is characterized by a semi-arid climate with an average annual rainfall of 12.2 inches and the average annual temperature of 46.3 ^{o}F (Hammer, 1998). Rainfall is fairly uniform throughout the year with May and June typically being the wettest months (2-3 inches). Summer temperatures tend to reach their maximum in August (high 90 ^{o}F's) and their lows in January and February (around 15^{o} F).

General description of the Aquifer

A generalized geologic map of the area is shown in figure 2. Geologic cross sections through the Victor area are shown on figure 3. Recent alluvium (Qal/Qafy) forms surficial deposits that range in thickness from 40 to 80 feet. These deposits consist of sand, silt, and gravel with minor amounts of clay present in sporadic lenses throughout the sequence of material. The aquifer is unconfined with fairly shallow water levels within 5 to 15 feet of the ground surface during the year. These alluvial deposits blanket the flood plain along the entire length of the Bitterroot River and along most of the main tributary drainages. Ground-water flow is northeast towards the Bitterroot River.

Ancestral Bitterroot River deposits (Tbg, figure 2) comprised of older Tertiary sand and gravels, and glacial outwash fan deposits (Qafo) form resistant ridges like Dineen Hill, that sit above the valley floor. However, at lower elevations, these units are overlain by clay that separates them from the recent alluvial deposits. This clay acts as a confining to semi-confining unit. Water levels in this unit are between 16-40 feet below ground surface. Ground-water flow through the area is to the northeast towards the Bitterroot River.

The Public Water Supply

The Victor School has three wells. The locations of the wells and distribution system are shown on figure 4. One of the wells supplies water only for irrigation; the other two provide drinking

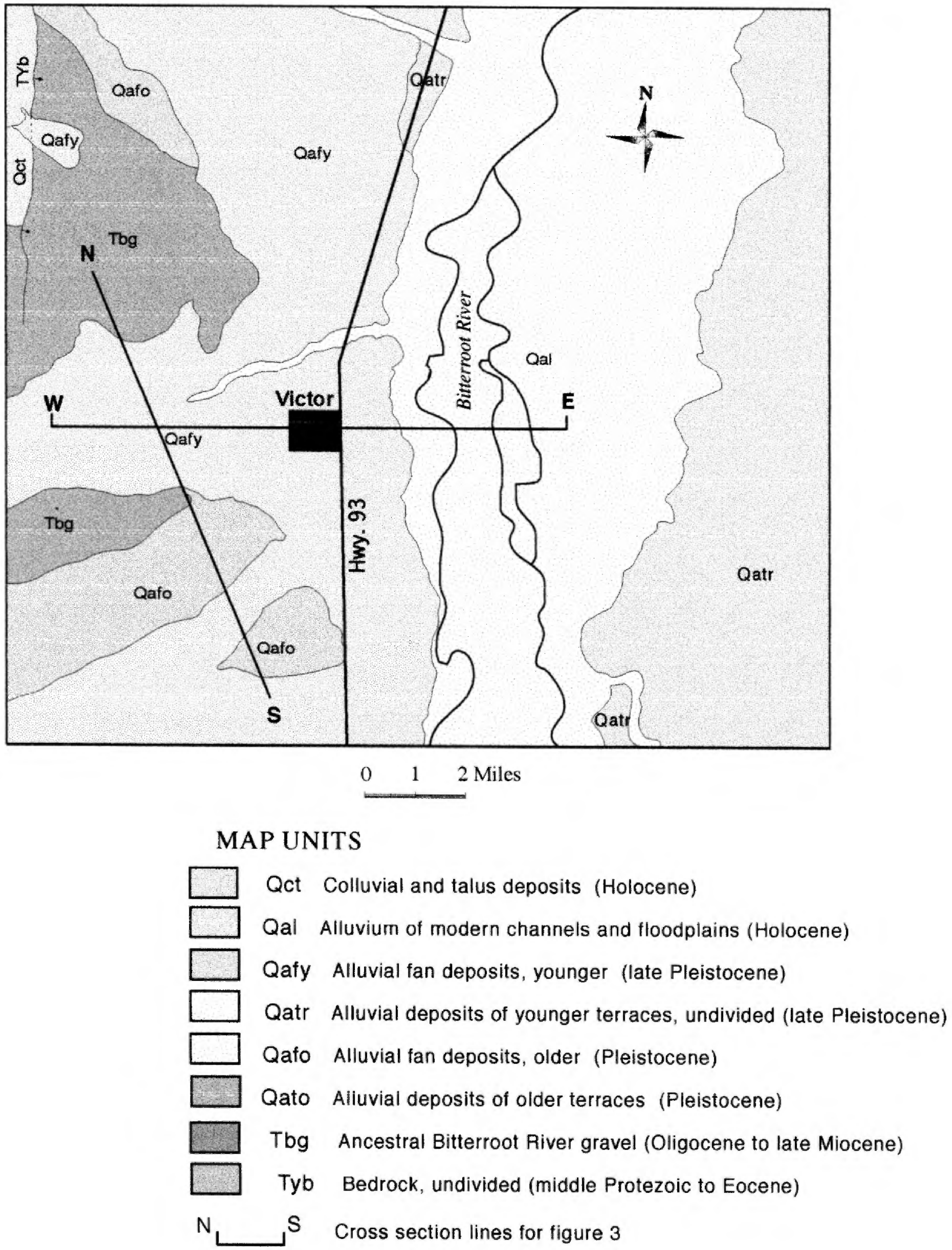
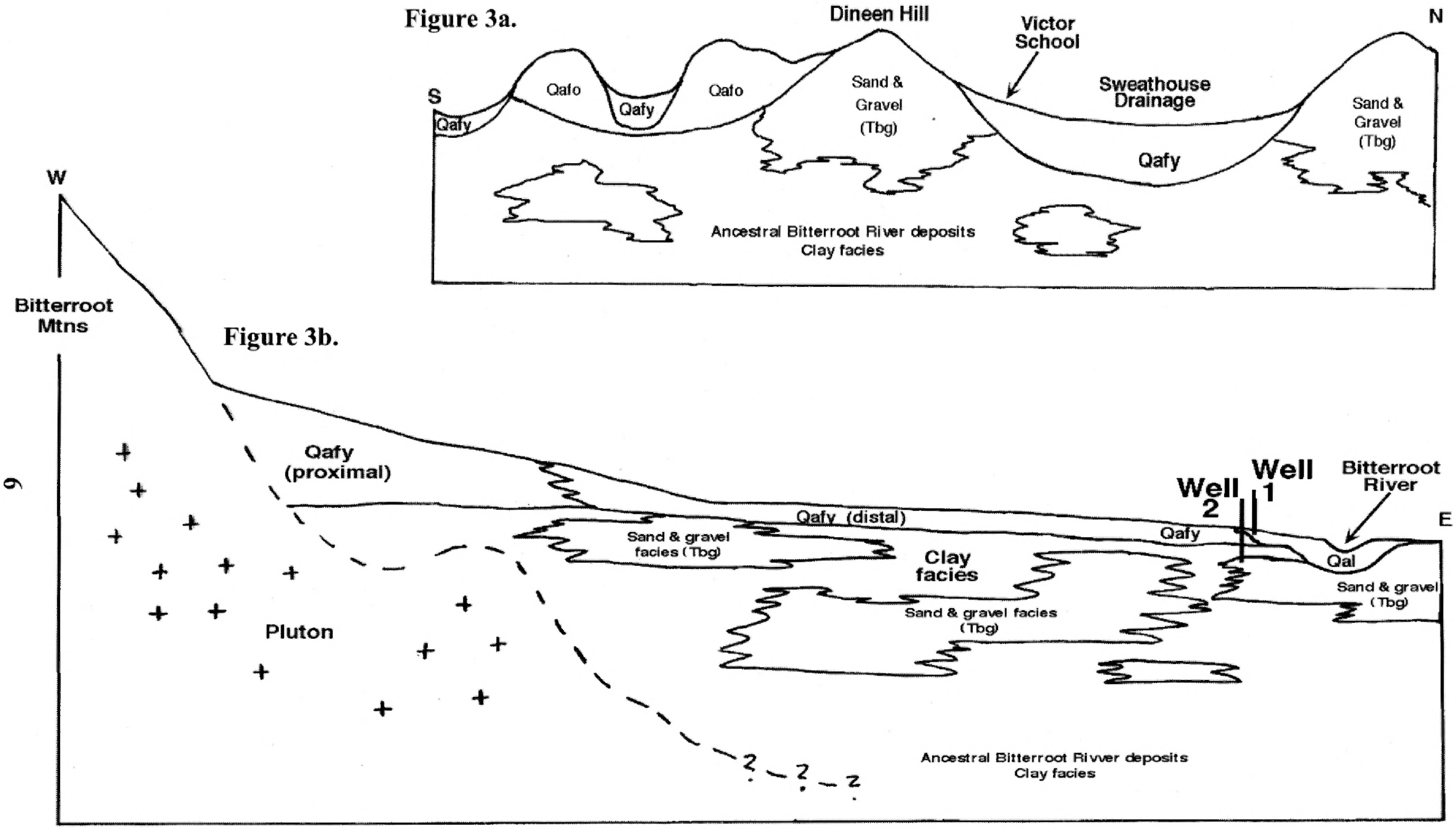
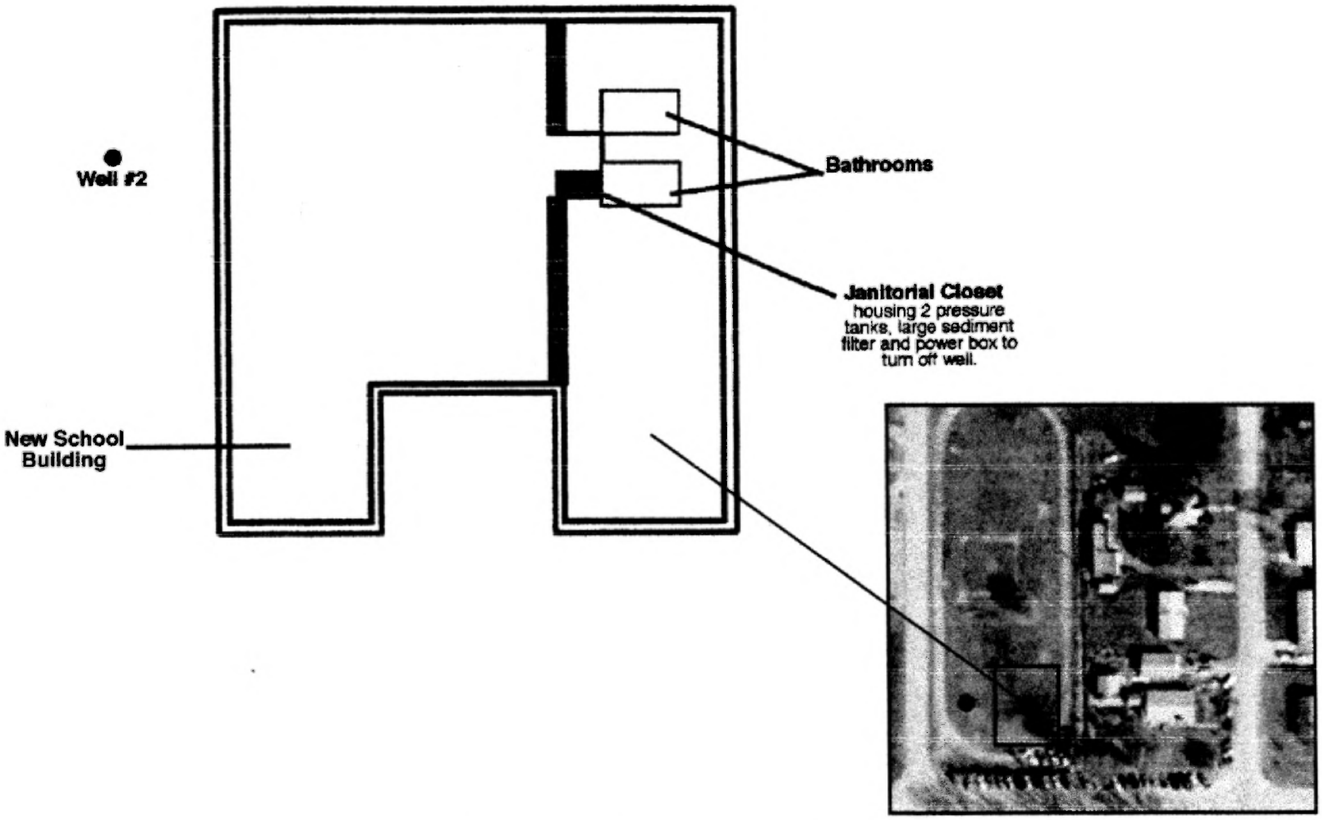


Figure 2. Map showing the geology in the vicinity of Victor, Montana. (Modified from Lonn and Sears, 1998).



Figures 3a and b. Schematic cross-sections of the Victor area showing stratigraphic relationships between geologic units. 3a looks west up Sweathouse drainage. 3b is a west to east cross-section from the Bitterroot Mountains to the Bitterroot River along the Sweathouse Creek drainage. Well 1 is completed in the shallow aquifer (Qal), and well 2 is the school's new well that penetrates the Ancestral Bitterroot deposits (Tbg). Not to scale.



Basement Section of Main Building

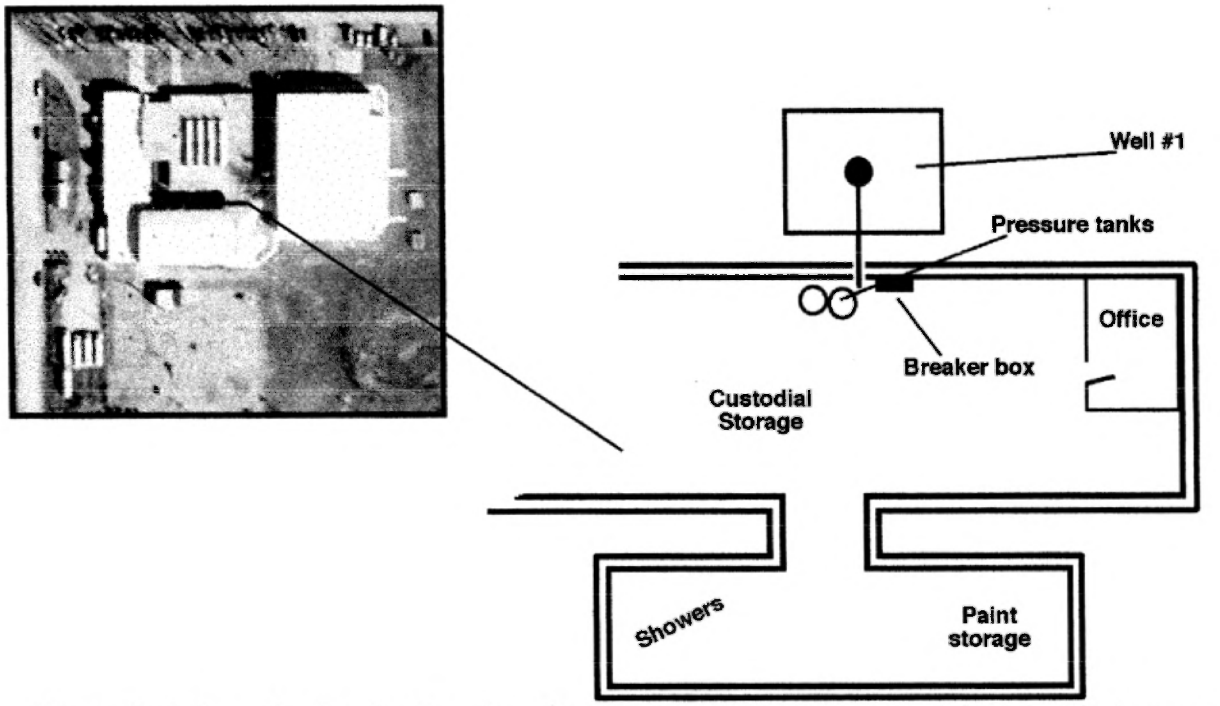


Figure 4. Schematic showing location of wells and breaker boxes supplying electrical power. (not to scale)

water. Two wells are completed in the shallow aquifer (well 1 refers to the well in the main building and the irrigation well). A third well adjacent to the new building (referred to as well 2) penetrates an older deposit of sand and gravel. A source-water protection region was delineated for the two drinking-water wells.

Well 1 is located in a small basement room with the water piped to an adjacent room where three pressure tanks are located (figure 4). From here the water is distributed to the rest of the building. A full kitchen is located in the main building. Also housed in the main building are four sets of bathrooms, one set of showers off the gym, and a set of showers for the referees located off the custodial storage room, a small concession stand with one sink, one teachers' lounge, and a home-economics room with several sinks.

Well 2 is located outside of the building to the west. Water is piped into a pressure tank room that houses two 80-gallon tanks. Water from the pressure tanks is passed through a large sediment filter before being distributed throughout the school. The new building has one set of bathrooms and a teachers' lounge. Each schoolroom is equipped with a sink. Both wells servicing the school are in productive aquifers and should be adequate to meet the growing needs of the school.

Influencing Factors

The difference in aquifer characteristics between the school's two wells, was a factor in defining the source-water protection regions.

Source-Water Protection Management

Orville Getz, the principal and superintendent, and Gene Morin will be responsible for implementation of the plan.

CHAPTER 2
DELINEATION

The purpose of this chapter is to describe how the source-water protection region for the Victor School well was determined. This "delineated area" defines the portion of the aquifer or ground-water flow system that contributes water to our well. The delineated area includes the zone of contribution to the well through the recharge region to the ground-water divide as determined by application of analytical equations for ground-water flow and simple hydrogeologic mapping. The delineated source water protection area for the Victor School has been subdivided into three regions for prioritization and ease in management. These three areas include the control zone, special protection region, and protection region.

The control zone is a 100-foot radius around the well. Certain spills or land-use activities in this zone have the potential to quickly impact the well, hence control of potential contaminants is critical.

The special protection region represents the calculated zone of contribution to the well for a distance of about 6000 feet, which also approximates a time of travel of three years. The delineation is based on pumping and aquifer characteristics. Spills or leaks of certain contaminants and some land uses within this region are also considered likely to contaminate the well but early detection, response, and remediation will prevent the long-term loss of water quality.

The protection region represents the recharge area for the portion of the aquifer that contributes water to the Victor School water system as delineated by aquifer characteristics and hydrogeologic mapping.

Geologic Conditions and Aquifer Characteristics

A geologic map of the area is shown on figure 2. Schematic cross-sections are presented in figure 3a and b. The well that serves the main building (well 1) penetrates and is completed in the shallow, alluvial deposits (Qal) covering the valley floor. Well log descriptions throughout the valley indicate these alluvial deposits range from 40 to 80 feet thick. The deposits consist of sand, silt, and gravel with minor amounts of clay present in lenses, which are sporadic through the sequence of material. This unit is considered a water-table aquifer and is unconfined with ground-water levels 5 to 25 feet below the ground surface during the year. Seasonal fluctuations in water levels are on the order 10 feet with highs during late summer early fall and lows in the early spring. This is likely due to natural recharge from runoff and precipitation.

Values of hydraulic conductivity were obtained from recent and extensive aquifer tests conducted in the Victor area by Maxim Technologies, Inc. Their study area was located in and around the old landfill site located one-mile southeast of the school. In this study, 30 wells of various depths were drilled. These wells penetrate alluvium, outwash fan deposits and ancestral river deposits. Well tests indicate hydraulic conductivity values for the recent alluvium are on the order of 100-200 ft/d (Maxim Technologies, Inc, 1998). The hydraulic gradient, measured from the water table map constructed for the Victor area during this project, is 0.0064. Ground-water flow across the study area is to the northeast (figure 5).

In the flood plain, the alluvial deposits overlie thick sequences of sand and gravel that are part of the Tertiary Ancestral Bitterroot River deposits (Tbg, figure 2 and 3) and in some places, may overlie Quaternary-age glacial outwash fans (Qafo, figure 2 and 3). Along the margins of the valley, these Ancestral Bitterroot River and glacial outwash fan deposits are exposed at the surface, forming resistant hills and most likely act as one hydrogeologic unit. In these areas, the recent alluvial deposits abut the Ancestral Bitterroot River and glacial outwash fan deposits, generally with no intervening clay unit and, therefore, may be connected hydraulically to the older alluvium. The driller's log indicates that throughout the Ancestral Bitterroot River deposits are interbedded clay beds that range between 2 to 10 feet thick, possibly resulting in semi-confining conditions. Topographically, these deposits are adjacent to the glacial outwash fans, therefore, these units are sometimes difficult to distinguish from each other in well logs.

Hydraulic conductivity estimates for the Ancestral Bitterroot River deposits range from 1.4 to 5.3 ft/day, while the outwash fans have a lower hydraulic conductivity on the order of 0.6 ft/day, reflecting a higher clay content (Maxim Technologies, Inc, 1998). Depths to water in this unit vary across the study area from 16 to 32 feet. Ground-water flow is towards the northeast with a gradient of 0.0135 (figure 6).

The pH of the ground water in the shallow alluvial material is nearly neutral, around 7.3. Specific conductivity is around 171 micromhos/cm. In general, the water is a calcium bicarbonate type with small amounts of magnesium and sulfate. A complete analyses of ground water from the shallow well (well 1) is included in appendix A. Well 2 has not been sampled by MBMG, but field specific conductivity values were collected during drilling (Newman, 1998). These values are lower than that of the shallow unit, averaging 80 micromhos/cm.

Source Well(s)

Well locations are shown on figure 4. Appendix B includes the driller's log for the wells 1 and 2, and the irrigation well.

Well 1 is 70 feet deep and is located in the basement of the main building. A manhole, located on the main floor of the building, provides the only access to the well. The well is housed in a small enclosure that has a dirt floor. The floor for the enclosure is approximately three-feet below the manhole. Water is piped from the well, through a wall into a custodian's storeroom, and enters the pressure system before being distributed throughout the school. The well is equipped with a Gould submersible one horsepower pump.

Well 2 is152 feet deep and is located near the new building to the west. The well is equipped with a Myers 3035B, three horsepower pump.

The irrigation well is located behind the school, in a fenced area that includes the greenhouse. This well is 38 feet deep and is used for irrigating the football field and servicing the greenhouse.

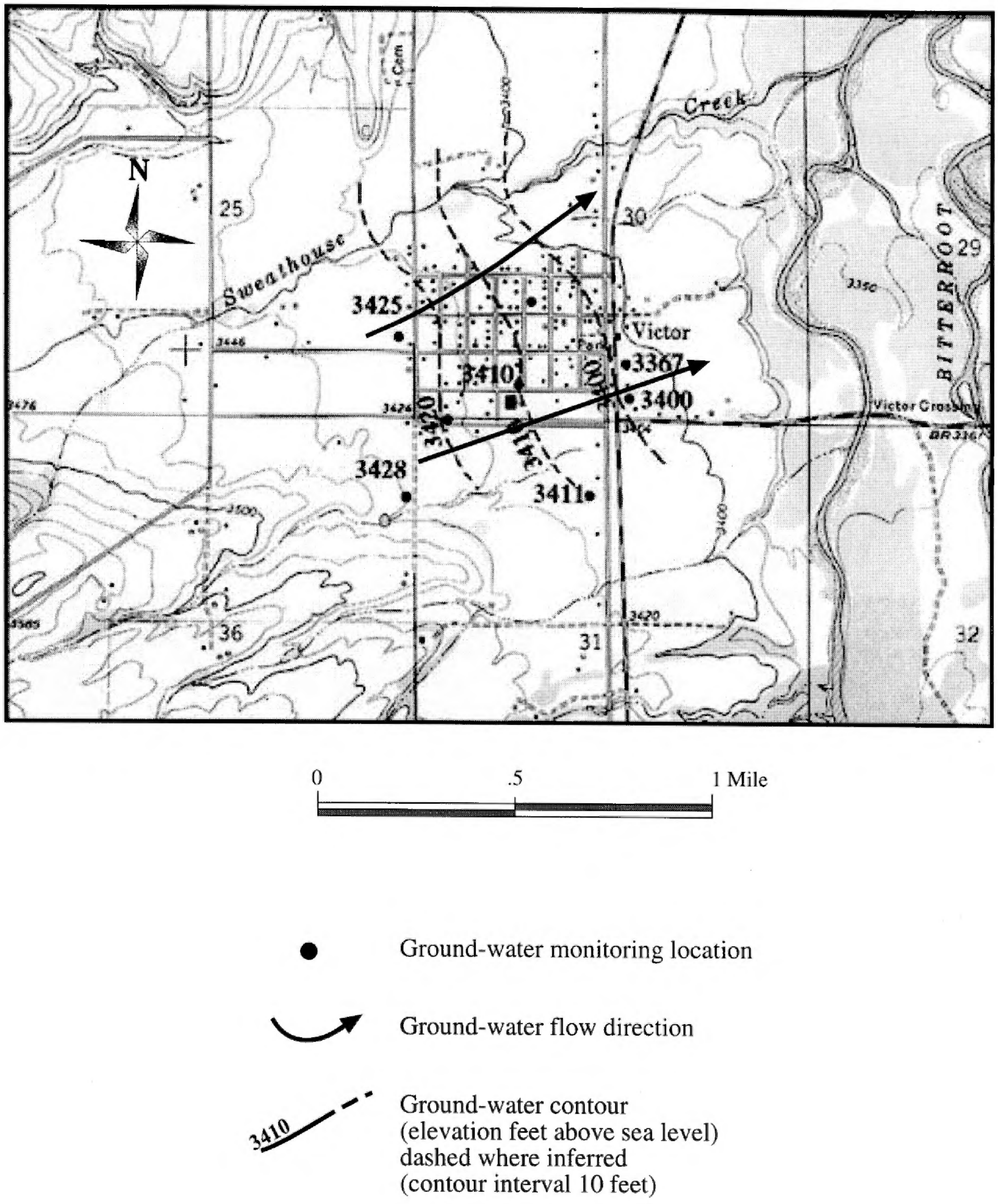
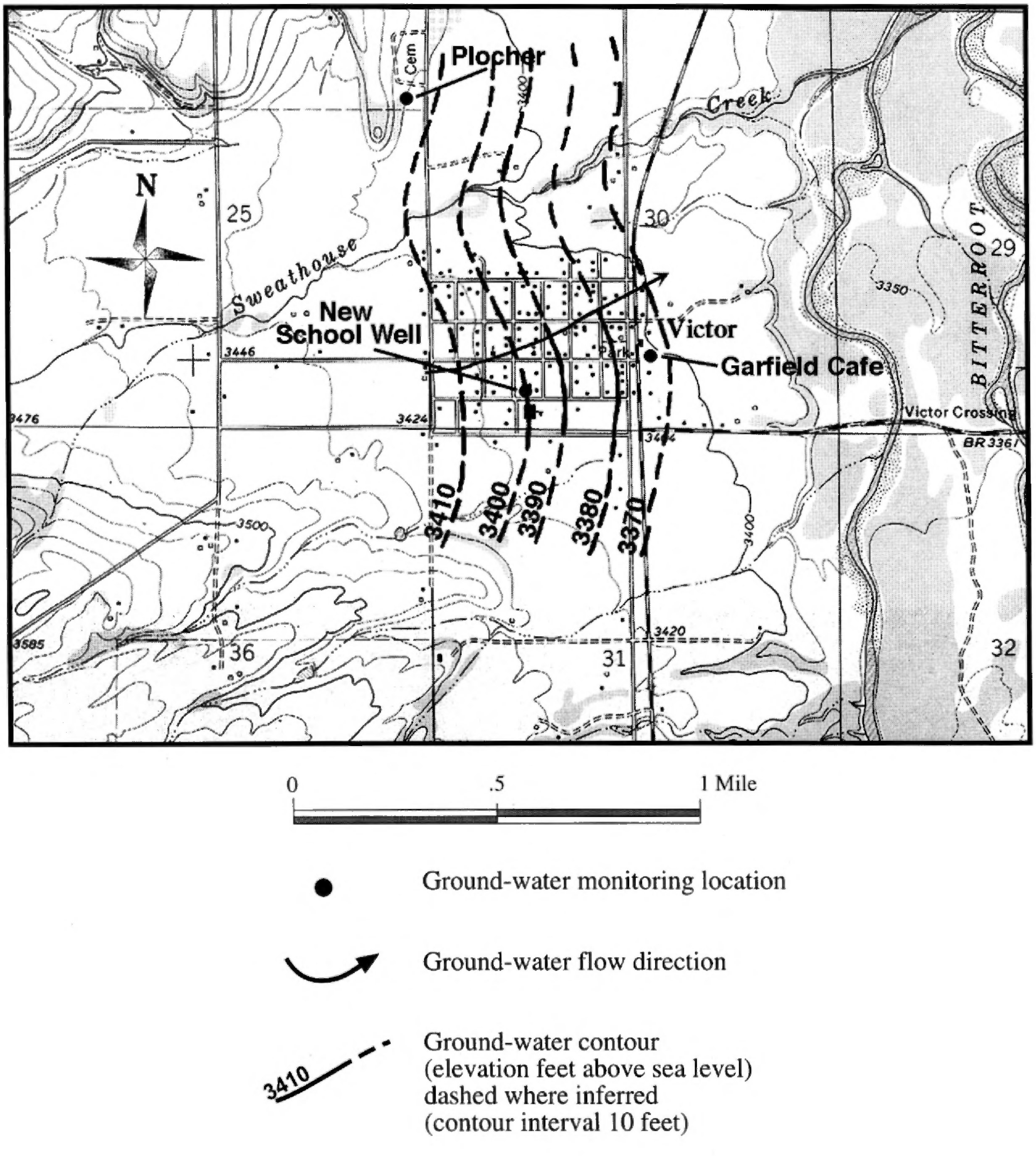


Figure 5. Water table map of the shallow aquifer (September, 1997).



Well Location	**Ground-water Elevation**
Garfield Cafe	3375
New Well at School	3400
Plocher	3413

Figure 6. Potentiometric surface of the deeper aquifer (November, 1998).

This well is perforated from 30 to 35 feet. The well has a sanitary seal cap. A jet pump is attached and mounted inside the greenhouse next to the pressure tank.

Delineation Method

The methods used to calculate the source-water protection regions consist of using a fixed radius and the WHPA Semi Analytical Model for Delineation of Wellhead Protection Areas (Environmental Protection Agency (EPA), 1991). The Multiple Well Capture Zone module (MWCAP) was used in the delineation. A description of the module is included in appendix C. For a detailed discussion on the theoretical development of the module, the reader is referred to the model documentation (EPA, 1991). Hydrogeologic mapping and the semi-analytical model were used to define the boundaries of the protection region.

Control Region

The control region was identified using the fixed radius method. A fixed radius of 100 feet was delineated around each well (figure 7).

Special Protection Region

The special protection region was delineated by using the WHPA semi-analytical model (WHPA, 1991) results as a guide and then tailoring the special protection region to hydrogeologic boundaries and recognizable landmarks (figure 8).

The input parameters for well 1 (shallow aquifer) and well 2 (deeper aquifer) are listed below:

Aquifer Thickness:

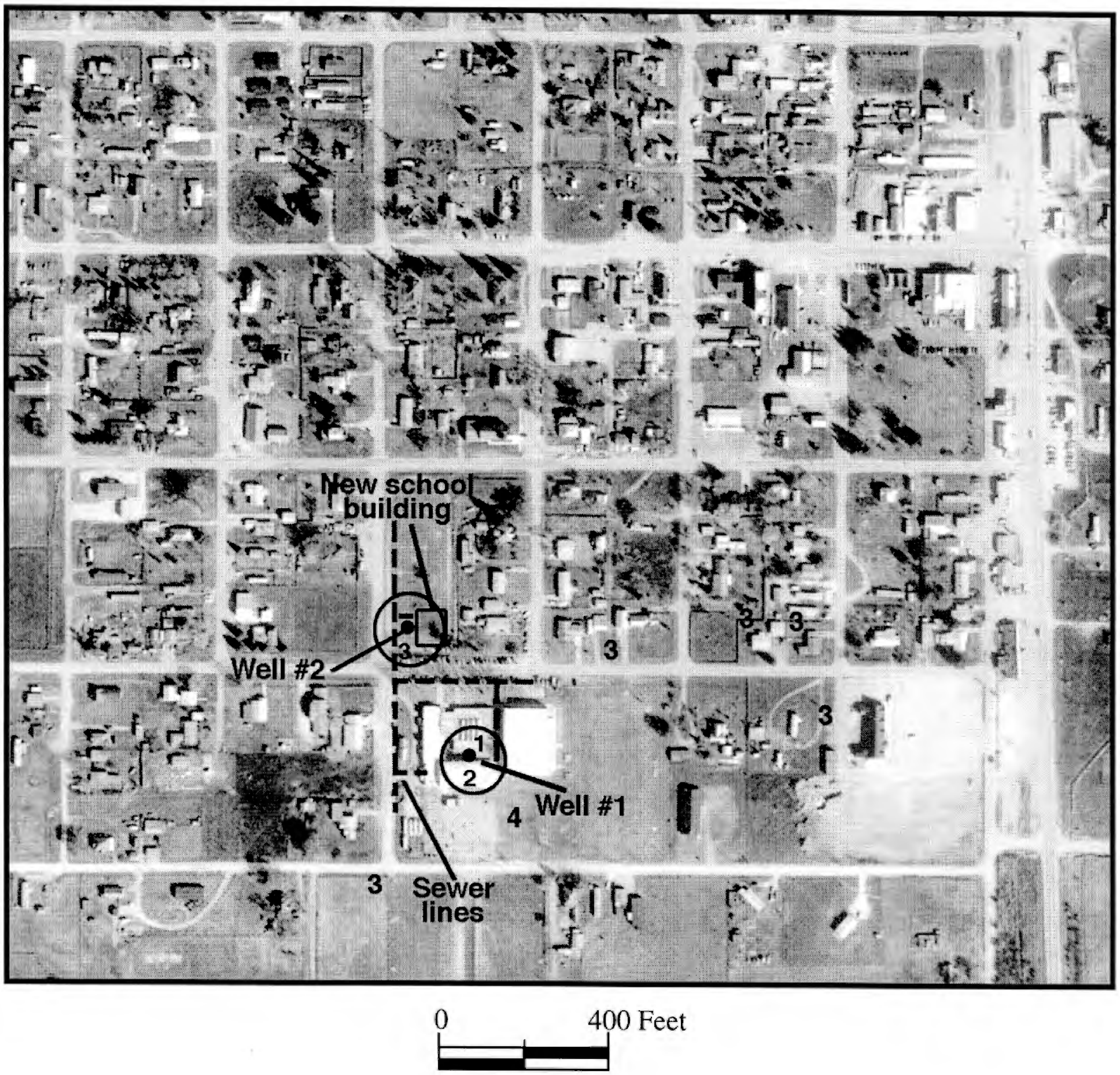
Well 1: 50 feet
Well 2: 5 feet

The wells do not necessarily penetrate the complete thickness of the aquifer. The aquifer thickness for the shallow well is the height of column of the ground water in the well. The aquifer thickness for the deeper well is the length of the screened interval.

Transmissivity:

Well 1: 7,500 ft^2/day
Well 2: 27 ft^2/day

Transmissivity values were estimated from hydraulic conductivities obtained from aquifer tests conducted in the Victor area by Maxim Technologies, Inc. Their study area was located in and around the old landfill site located one-mile south and southeast of the school. In this study, 30 wells of various depths were drilled. These wells penetrated recent alluvium, outwash fan deposits, and ancestral river deposits. Transmissivity for well 1 (shallow aquifer) is based on the average hydraulic conductivity from three observation wells during one aquifer test. For the deeper unit (well 2), the transmissivity of 27 ft^2/day is the upper value from aquifer tests in the Ancestral Bitterroot River



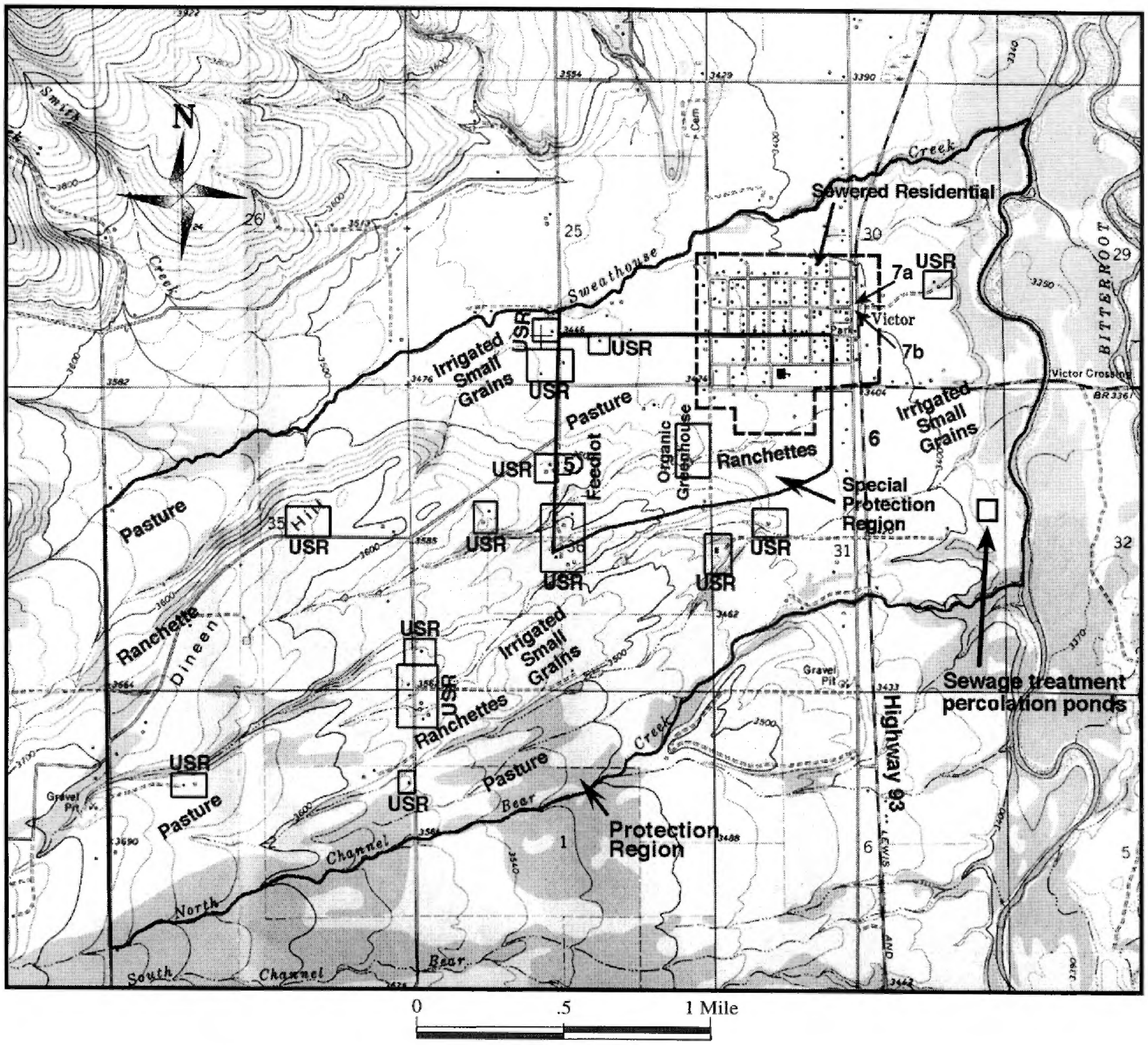
1 Inventory site ID number
(Refer to appendix E, Inventory Form 1)

○ 100' radius, Control Zone

▬ ▬ ▪ Sewer lines

● Well

Figure 7. Aerial photograph showing the control zones, school buildings, and inventory results.



- - -	Sewer District
■	Service Stations
7	Inventory Site ID number
USR	Unsewered residential (Inventory forms included in appendix E)

Figure 8. Illustration of special protection, protection region, sewered district and inventory items.

deposits. Transmissivity values were calculated using Maxim's reported hydraulic conductivities and aquifer thickness values at the school site. These thicknesses were derived from interpretation of the school's well logs.

Effective Porosity:

Well 1: 0.16

Well 2: 0.25

The value for well 1 was an average of specific yield from observation wells used in aquifer tests. The value for the deeper aquifer was an estimate that represents lower range porosity for sands (Freeze and Cherry, 1979).

Gradient:

Well 1: 0.0064

Well 2: 0.0135

This gradient was obtained from the water table map of the shallow aquifer and the potentiometric map for the deeper aquifer; both were compiled from data collected during this study.

Angle of Ground Water Flow:

The ground-water flow direction helps define the shape of the source-water protection region. The WHPA Semi-Analytical model defines a value of 0° representing ground-water flow due east (90° due north). For modeling purposes, the angle of flow was defined with

Well 1:17°

Well 2: 5°

Well Discharge:

Well 1: 1400 ft^3/day

Well 2: 250 ft^3/day

The Manual of Small Public Water Supply Systems (EPA, 1991a) indicates that a school with a cafeteria, gymnasium, or showers uses about 25 gallons per day (gpd) per person. Current enrollment in the main building (well 1) is 273 students and 27 teachers/staff. However, all students and staff use the cafeteria and gym in the main building. The discharge rate for the shallow well is based on total school enrollment and teacher/staff numbers at 25 gpd. Enrollment in the new building is 107 students and 8 teachers with only one set of bathrooms and no other services. The discharge rate of 250 ft^3/day for this well is based on 125 people using 15 gpd. Discharge estimates were rounded up.

Time of Travel: Three-years

A three-year time of travel was used in the model estimation.

The modeling results for well 1 indicate a special protection region of about 50 feet wide. The upgradient extent was about 6200 feet and coincided with a north-south road. The downgradient limit was negligible.

Using a transmissivity of 27 ft^2/day for well 2 yielded a nearly circular source-water protection region of about 400 feet upgradient and 200 feet downgradient. The modeling results were used as a guide, and emphasis was placed on the delineation that provided the largest areal extent. One special protection region was defined for both wells. The special protection region was conservatively fitted to known boundaries, where possible, to allow for local recognition and also accounts for potential changes in the ground-water flow direction for both aquifers. The special protection region is shown on figure 8.

Protection Region

The protection region was identified using hydrogeologic mapping for the lateral and downgradient extent of the region. The lateral limits are Sweathouse Creek to the north and North Channel Bear Creek to the south. The downgradient limit extends to the Bitterroot River. The upgradient extent of the protection region was fitted to Red Crow Road, which is close to three miles upgradient of the school. This distance coincides to a six-year time of travel. The protection region is shown on figure 8.

Assumptions

Several assumptions were associated with the delineation. To prepare the ground-water flow map, elevations for each well had to be estimated using the 10-foot contours shown on the topographic map. Therefore, ground-water flow directions and gradients are as accurate as the topographic elevation data. Water-level contours were dashed to indicate uncertainty.

When estimating the capture zone of the well using the modeling approach, it was necessary to assume values of transmissivity and porosity. Hydraulic conductivity estimates were available from aquifer testing conducted approximately one mile from the Victor School. These estimates were used to calculate transmissivity in the aquifers that the school wells are completed. Porosity was estimated based on specific yields for the shallow well and aquifer material for the deeper aquifer.

The WHPA model used to define the source-water protection region assumes that the aquifer is isotropic and homogeneous. An aquifer is isotropic if hydraulic conductivity is the same regardless of the ground-water flow direction; it is homogeneous if its properties are uniform throughout. The shallow alluvium is fairly continuous across the area. While it varies in its clay, sand and gravel content, over the study area it can be assumed to be homogenous. This is not the case with the deeper unit. The deeper unit, because of geologic diversity, varies in its hydraulic conductivity values and thickness, which affects transmissivity. The model also assumes that the pumping well is screened across the entire saturated thickness of the aquifer and that it is pumped continuously at the same rate. Finally, because the model is two-dimensional, it assumes that vertical flow within the aquifer is negligible.

Time-of-travel estimates are valid if the contaminate is traveling at the same rate as ground water.

Limiting Factors

Major assumptions used in the application of many ground-water flow models are 1) flow in the aquifer is uniform, and 2) flow in the aquifer is horizontal. A ground-water flow model for any specific set of conditions should be considered within these limitations, as ground-water flow is generally not uniform or strictly horizontal. Any particular modeling effort merely represents the best estimate of ground-water flow conditions based on known and estimated hydrogeologic and pumping conditions and should be modified as additional information becomes available.

The delineation shown on the base map (figure 8) represents the estimated capture zone, which assumes the flow direction is valid within 45 degrees and is based on a maximum daily pumping rate. This should yield a capture zone that will still be safe as the water demand increases. Specific limitations to this delineation include the absence of a well-defined thickness of the deep unit and its stratigraphic complexity and heterogeniety.

Ground Water Under the Direct Influence of Surface Water (GWUDISW)

A preliminary assessment score sheet was completed for the public water supply. Well 1 scored 40 and well 2 scored 10. The high score for well 1 is due to the unknown intake construction. Well 1, serving the main building, is completed within a water-table aquifer; however, the well is 70 feet deep, and the closest surface water is 750 feet upgradient from the well. The well is cased to a depth of 70 feet and is in good condition. Well 2 is 152 feet deep with a thick layer of clay above the water-bearing zone. Neither well is considered under the influence of surface water. A GWUISW form was filled out and is included in appendix D.

CHAPTER 3
INVENTORY

A potential contaminant source inventory generally identifies all land uses in the delineated areas and lists the location of certain land uses as well as potential contaminant sources in relation to the well. An intensive survey was conducted in the control and special protection zones; potential contaminants also were inventoried in the protection zone, but the effort was not as intensive due to the lower risk associated with this area.

Inventory Method

The methods used to inventory potential contaminant sources included a review of 7.5-minute topographic maps and an aerial photograph for transportation routes and land use, a windshield survey and door-to-door survey, and a search of DEQ's underground storage tank and the EPA Hazardous Waste List. Inventory sheets were completed for specific activities or sites of concern and are located in appendix E. The locations of these sites for the control area were plotted on an aerial photograph (figure 7), and on a 7.5-minute topographic map for the special protection and protection region (figure 8).

Inventory Results/Control Zone

A 100-foot radius around the each well was inventoried. The control zones are shown on figure 7. Sewage system pipes are located in the control zones of each of the wells. The service lines that connect the school to the sewage system are located within 15 feet of well 1 and 13 feet of well 2 (figure 7, Inventory Form 1, site ID 1). The service line for well 1 is composed of iron ductile pipe. The upstream portion of the sewer system extends west from the school, servicing two residential blocks. The sewer pipe near well 2 is composed of PVC and the utility trench is for the service line only (Martin, 1999). The potential does exist for leaks and sewer pipe breakage. Should this occur, there is the possibility of microbial/nitrate contamination to groundwater.

Well 1 is located inside the main school building and is housed in a small area under the floor of a rear hallway. The 100-foot control zone encompasses the building and a small courtyard used by the students. The well enclosure has cement walls and a dirt floor. The dirt floor is about three feet below the school building floor and four feet above the level of the basement. The width of the enclosure is approximately 2.5 feet.

Adjacent to the well enclosure, on the basement level, is a custodian's storage area where plumbing from the well enters three pressure tanks. This area is used to store various cleaning supplies and maintenance equipment. The room is mostly cemented with the exception of several small areas of bare ground. These patches of bare ground are located at the bottom of a slight slope in the floor and adjacent to the wall between the well enclosure and the custodial storage. There is no drain located in the room, and the slight slope towards this wall may allow any water or potential spills to pool and possibly drain into the bare ground areas. During the inventory, water appeared to be leaking from the adjacent pipes and had pooled in this area. Even though cleaning supplies are kept on the other side of the room, this presents an opportunity for a spill to infiltrate the porous material and potentially travel to the well intake (figure 7, Inventory Form 1, site ID 2).

Well 2:
This well is located about 15 feet from the newer school building. The area surrounding the well is grass and bare ground. The undulating topography has not been graded to encourage surface drainage away from the well. Within this zone is a paved road, and parking (paved and unpaved) area (Inventory Form 1,site ID 3). The parking area has no drain, and the area is not contoured to encourage drainage in any specific direction. The street dips slightly toward the grassy area where the well is located and runoff pools because this area is not contoured either. Although no hazardous substances are delivered to the school, spills or leaks from cars parked in the lot can potentially impact ground water if drainage is towards the well.

Inventory Results/ Special Protection Region
The special protection area encompasses a variety of land uses. Most of the area is rural with land either used as pasture/irrigated hay or subdivided into ranchettes. The Victor School is located on the southern edge of town and on the edge of the sewer district. A small subdivision is developing behind the school; however, it is connected to the sewage system. Beyond this area, the ranchettes and older ranches are unsewered and septic systems may pose a potential risk to the ground water. Several county roads dissect the region and accommodate mostly residential traffic. Most of the area is supplied by natural gas; therefore, fuel trucks do not usually travel the county roads. The school does not use herbicides, but does use compost from the Hamilton sewer treatment for fertilizing the football field once a year. The compost has been reduced to a form that tests negative for bacteria. The county weed department does not spray for weeds within the populated area of the town or surrounding area. In the rural segment, spraying is limited to site-specific areas. The most common chemicals used are 2,4-D, Escort, and Tordon (Day, personal communication, 1998). Because of the limited use of herbicides, this was not identified as a concern in the special protection region.

Inventory items of concern within this region include the parking area for the school, the old school septic field, and the location of a storage tank listed on EPA's hazardous chemical list. These concerns are discussed below and shown on figures 7 and 8.

Most of the parking area is paved with no drains and has not been graded for drainage. Water can pool in places, or flows into to adjacent grass and dirt where it may pool and infiltrate (figure 7, Inventory Form 2, site ID 3).

The old septic site is behind the school and adjacent to the football field (figure 7, Inventory Form 2, site ID 4). Although the school and the community have been sewered for over 20 years, septic systems can pose nitrate, bacteria and virus problems. Outside the sewered area, there is no formal stormwater collection or disposal system. Problems from septic systems may arise with development of new subdivisions and single resident housing.

An animal confinement facility is located within the special protection region (figure 8, Inventory Form 2, site ID 5). School personnel are unfamiliar with the facility, and it is not registered with the DEQ (Byron, 1999). The facility is located near a surface drainage and manure piles were noted. The site can potentially impact ground-water quality (elevated nitrates are sometimes associated with facilities of this nature). Recent nitrate sampling downgradient of this area did not uncover any nitrate problems (GWIC, 1999).

Burns' furniture-stripping facility is located in the special protection region and is on EPA's list of hazardous material storage (methylene chloride). This site is located about 200 feet away from well 2. However, a DEQ field investigation report indicated that the owner had not stripped furniture for more than a year and a half prior to when the field report was written and had no plans to resume operation. A copy of the field report is included in appendix D as an attachment to Source-Water Protection Inventory Form 2. This site was not considered a concern.

Inventory Results/Protection Region

Land use in the protection zone is shown on figure 8. Most of the region is pasture or irrigated hay fields. Several county roads cut through the region with most use consisting of residential commuters. Downgradient of the wells, within the protection region is a strip of Highway 93 and a couple of gas stations. Traffic along Highway 93 probably includes fuel trucks and other petroleum substances that could be a problem in the event of a spill (Inventory Form 3, site ID 6). Two gas stations were located in the protection region. The Sinclair Station no longer sells gasoline and is noted as site ID 7a, and the Exxon Station is noted as site ID 7b (figure 8, Inventory Form 3, appendix E).

Victor's wastewater treatment facility is also located in the protection region (figure 8), close to the Bitterroot River. The treatment system consists of an aeration basin, a chlorination chamber and percolation ponds for final disposal (Morrison-Maierle, Inc., 1977). The treatment system is downgradient of the school and close enough to the river to receive the final effluent disposal. The wastewater treatment system is considered a minimal risk to the school's drinking water and was not given an inventory number.

Inventory Update

The operator will update the inventory every year. Changes in land uses or potential contaminant sources will be noted and additions made as needed. Any changes will be submitted to DEQ every five years to ensure recertification of the source water protection plan. Any major industries located in the special protection and protection region will be investigated.

Inventory Limitations

A section of the protection region could not be driven through, although it appears to be a continual strip of pasture and woodlands.

Organic Chemical Monitoring Waivers

The land use around the school has been mapped and once the Source-Water Protection Plan has been submitted and approved by DEQ, efforts by the school may begin towards obtaining appropriate chemical waivers.

CHAPTER 4
MANAGEMENT

The goal of the Source-Water Protection Plan is to 1) protect the source water by keeping potentially polluting materials and activities out of the control zone, and 2) to manage the special protection region to ensure land-use activities pose minimal threat to the source water.

Control Zone Management

The sewer lines within the control zone of the wells are a high hazard if conditions occur that can lead to breakage such as driving heavy equipment over the utility trench or when excavating in the area. It will be the responsibility of the public water supply operator to ensure that due caution is exercised when working in this area. Due caution may include marking the utility trench location and providing direct oversight when any equipment is working in the area.

The wellhead for both wells will be inspected annually to ensure that the cap is in good condition.

Well 1:
Along the wall between the custodial storage room and the well are places where the floor is not cemented, and bare ground is exposed. Items stored in the room include organic and inorganic substances that could be potentially hazardous if they spilled and infiltrated in the bare ground areas. The floor in the storage room will be completely cemented and absorbent materials will kept on site should a spill occur.

Well 2:
The surface around the well will be contoured so that there is positive drainage away from the wellhead. This will occur in the spring/summer 1999.

Special Protection Region Management

There are several items of concern for the special protection region. Although current herbicide/pesticide spraying along county roads was not considered a concern, weed control personnel will be given a copy of the source water protection plan in case future spraying practices change. They will be asked not to mix chemicals in the special protection region.

There are areas within the special protection region undergoing residential development. Some of these areas lie outside of the sewered district. Long-term impacts of this continued development could include problems due to septic tank density that may increase the risk of nitrate and/or microbiological contamination to ground water. The Ravalli County Planning Office will be given a copy of Victor Schools Source Water Protection Plan so that they are aware of the extent of the special protection region and the potential impact new development may have on groundwater. The county currently adheres to DEQ's subdivision regulations (Schwecke, 1999).

The county may want to manage future development by considering options such as requiring new buildings to connect to the sewer system and requiring larger lots in sub-division developments that would decrease septic tank density. The community will be made aware of Victor's School Source-Water Protection Plan through an article in the local paper. The science teacher at the school will be responsible for submitting the article to the local paper.

Protection Region Management

The only items of concern in the protection region are located downgradient of the two wells. These items are Highway 93 and the two gas stations located in town along the highway. Management of this region will comprise an educational approach that notifies the public through the newspaper article. The Ravalli County Disaster and Emergency Services coordinator will be given a copy of the plan in case a spill occurs along Highway 93 that may threaten ground-water quality.

Every five years the DEQ's Underground Storage Tank Division (406/444-5977) will be contacted to determine if there are any new tanks or tank releases listed in the special protection and protection regions.

Management Implementation

Appendix F contains an outline of the school's responsibilities with respect to updating and managing the plan. Orville Getz, the principal and superintendent, and Gene Morin will be responsible for implementation of the plan.

CHAPTER 5
EMERGENCY PLANNING

The emergency plan identifies the principal threats to the source water, designates an emergency coordinator, and then describes a series of potential responses planned in the event of a problem arises. Another important aspect of the plan is an estimate of the equipment and materials that would be needed in the event of an emergency, a description of how a short-term replacement water supply would be handled, and a description of the funding available to deal with an emergency response.

Identification of possible disruption threats

The principal threats to the public water supply has been identified as a spill, leak, or discharge in the control zones, which could contaminate the source water by entering through the well bores. Contaminated shallow ground water could also enter through a failed casing. Included are spills/leaks from vehicles and from the sewer lines that are near the wells. Several businesses with underground fuel storage tanks are located in the protection region along with Highway 93, a major transportation route. The location of these are downgradient from both wells but should be kept in mind when considering possible threats and solutions to them in the event of leaks or spills.

Designation of an emergency coordinator

The emergency coordinator for Victor School is Gene Morin (406) 642-3221. The backup emergency coordinator is Orville Getz. (406) 642-3221.

The emergency coordinator is familiar with the county and state Disaster and Emergency Services (DES) procedures and is responsible for contacting the appropriate officials should a spill or other threat to the source water occur. The Ravalli County DES coordinator 24- hour phone number is (406) 375-6233. The State of Montana 24-Hour Spill Hotline phone number is (406) 444-6911.

Equipment and material resources

The principal identified threats to the well are generally limited to spills and/or leaks in the control zone. Resources that may be needed to respond to a spill are heavy equipment for berm and excavation work and absorbent materials. Should additional resources be needed due to the magnitude or chemical nature of a spill the Victor School will contract with an emergency response firm properly trained and equipped. A list of possible contractors is maintained and updated by the DEQ Enforcement Division (406) 444-0379.

Norm Vericruyssen, (406) 642-3506, the owner and operator of an excavation business in Victor, would complete any excavation work needed as part of a remediation effort resulting from a spill (406) 642-3506. A catastrophic loss of water will require the contracted services of a water hauler, a design engineer, and a well driller. However, in the case of the Victor school, surface contamination affecting the water quality in well 1 may not affect that of well 2. Well 2 can be connected to serve the whole school if necessary.

Procedures to shut down the well

Both wells can be turned off and isolated from their respective water supply system. Well 1 can be shut off using a valve on the main line as the pipe enters the custodian's storage room. The location of the valve is shown on figure 4. Also shown on figure 4 is the layout for well 2. Illustrated on this figure is the power switch for the well that is mounted on the wall. There are several valves on the main pipe from the well, including one halfway up the wall that turns the water off prior to the pressure tanks and filter. Under ideal conditions the system can operate without the well by using water in the water storage tank can for approximately one day. Well shut down is the responsibility of the operator or backup operator.

Coordination Procedures

The Victor School Source-Water Protection Plan has been made available to Ravalli County DES coordinator. Additionally, reportable spills will be handled as per the mandated reporting requirements as follows:

Agricultural chemical or fertilizer spills will be reported to the MT Department of Agriculture (406) 444-5400.
Any refined petroleum product such as gasoline, diesel, asphalt, road oil, kerosene, fuel oil, and derivatives of mineral, animal, or vegetable oil spills in excess of 25 gallons will be reported to the DES hotline (406) 444-6911.

Procedures to communicate with water users

The nature of the public water supply should allow the well to be isolated from the distribution system in the event of a spill in the control zone that threatens source-water quality. If it is determined that the source water was exposed to a contaminant, the well will remain off line until sampling proves the water to be safe, an evaluation done in cooperation with the MT DEQ, Public Water Supply Section. In the event the water is unsafe to consume, the school administration will make a school-wide announcement, and signs would be posted at water fountains and at all faucets.

Source of emergency water

The Victor School is in a unique position. One of their wells is completed in an unconfined shallow aquifer that is potentially vulnerable to surface spills. Their new well is in a deeper confined unit that is not so vulnerable and could serve as a backup supply. If either well is out of service for more than one day, an emergency supply of water may need to be arranged. The short-term plan is to haul water using a DEQ-approved water source. Should this be necessary, a hauler will be contracted and a short-term plan relating to the source water and disinfection requirements will be submitted to DEQ-Public Water Section for approval. Culligan Water in Missoula, (406) 721-1991, can be contracted to supply short-term water needs.

Should a total loss of water occur from either well, the possibility exists of using the alternate well to supply the needs of the whole school. The distribution systems for the two buildings are not connected. Connecting the new well to the main building would require plumbing, an expenditure that the school is unwilling to pursue unless it is absolutely needed. At this time, it is not part of the long-range plans for the school. However, in the event that it became necessary, it is estimated that it would take 3 to 4 days to connect the deep well to the distribution system of the main building. If both wells are taken off line then the services of a design engineer and well driller will be retained to assess the options. Plans and specifications for any new well will require DEQ-Public Water Supply Section review and approval prior to construction.

Disinfection and resumption of water service

The well and storage tank can be disinfected for bacteriological contamination as per the Victor School standard disinfection and tank cleaning procedures under the direction of the operator.

Normal water service resumption will occur after sample results indicate the supply is safe as approved by DEQ-Public Water Supply Section and the operator.

Funds

Finances to support actions during an emergency will come from the school's general funds.

Important emergency contacts and phone

CONTACT NAME	TITLE	PHONE	RESPONSIBILITY
Gene Morin	Custodian	(406) 642-3221 ext. 226	Certified Operator
Orville Getz	Superintendent	(406) 642-3221	Principal, emergency back-up
Ron Curly	DES Coordinator	(406) 375-6233	County Disaster/Emergency coordinator
Montana 24 hr.Spill Hotline"		(406) 444-6911	All reportable spills
Greg Murfitt	MT Dept of Agriculture	(406) 444-5400	All agricultural chemical or fertilizer spills or response questions
DEQ Enforcement Division		(406)444-0379	Responds to any event that will pollute surface or ground waters

CHAPTER 6
ALTERNATE WATER SOURCES

Historically, student population at the Victor School has had peaks and valleys although the overall trend has been upward. It is not unreasonable to expect fluctuation but an overall increase of 15-20 students every couple of years is possible. Both wells servicing the school are in productive aquifers and should be adequate to meet the growing needs of the school through its projected growth for more than a decade.

REFERENCES

Byron, T., 1999, Personal communication, Department of Environmental Quality, Helena, Montana.

Day, J., 1998, Personal communication on November 20, Ravalli County Weed District, Supervisor.

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Environmental Protection Agency, 1991a, Manual of Small Public Water Supply Systems, EPA 570/9/91-003.

Freeze, R.A., and Cherry, J. A., 1979, Groundwater: Prentice-Hall, Englewood Cliffs, NJ, 604 p.

Hammer, B., 1998, Personal communication on December 3, Stevensville Ranger District , Bitterroot National Forest, Zone Hydrologist.

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Martin, John, 1999, Personal communication, Martin Drilling, Victor, Montana.

Maxim Technologies, Inc., 1998, Personal communication, Cam Stringer, Missoula, Montana.

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Schwecke, T., 1999, Personal communication, Director, Ravalli County Planning Office, Hamilton, Montana.

Appendix A

Montana Bureau of Mines and Geology
1300 West Park Street, Butte MT 59701 (406) 496-4167

Analytical Laboratory Report
Analysis Id: **1997Q0217**

State: MT
Latitude - Longitude: N W **Datum**
Topographic Map: VICTOR 7 1/2'
Geologic Source: ALLUVIUM (QUATERNARY)
Drainage Basin: BITTERROOT RIVER
Agency + Sampler: MBMG * GNA
Field Number: VICTOR
Date + Time: 28-AUG-96 15:48:00
Lab + Analyst: MBMG * TSH
Date Complete: 9-Oct-96
Release Flag: YES
Sample Handling: 3120
Method Sampled: PUMPED
Procedure Type: DISSOLVED
Water Use:

County: RAVALLI
Site Location: 08N 20W 30 CDC 1
Site Id: 58061
Project: RADON *WHPSCHO
Station Id:
Sample Source: WELL
Land Surface Altitude:
Sample Media:
Sustained Yield / Method:
SWL above (-) /below MP:
Total Depth: 70 ft - Reported
Casing Diameter (in):
Casing Type:
First Completion Type:
First Perforation Interval:

Site Name: VICTOR SCHOOL DISTRICT

	mg/L	meq/L		mg/L	meq/L
Calcium (Ca):	18.9	0.94	**Bicarbonate (HCO3):**	92.7	1.52
Magnesium (Mg):	4.6	0.38	**Carbonate (CO3):**	0.0	0.00
Sodium (Na):	7.2	0.31	**Chloride (Cl):**	1.9	0.05
Potassium (K):	1.2	0.03	**Sulfate (SO4):**	3.2	0.07
Iron (Fe):	<.003	0.00	**Nitrate (as N):**	.6	0.04
Manganese (Mn):	<.002	0.00	**Fluoride (F):**	<1.	0.00
Silica (SiO2):	44.5		**OrthoPhosphate (as P):**		
Total Cations:		1.67	**Total Anions:**		1.68

Field Chemistry and Other Analytical Results (units as specified).

Calculated Dissolved Solids:	127.81	**Total Hardness as CaCO3:**	66.13
Sum of Diss. Constituents:	174.84	**Field Hardness as CaCO3:**	
Field Conductivity (Micromhos):	151	**Total Alkalinity as CaCO3:**	76.03
Lab Conductivity (Micromhos):	171.00	**Field Alkalinity as CaCO3:**	
Field pH:	7.41	**Ryznar Stability Index:**	9.39
Laboratory pH:	7.30	**Langlier Saturation Index:**	-1.04
Water Temp. (C):		**Sodium Adsorption Ratio:**	0.39
Air Temp. (C):		**Field Redox (mV):**	
Nitrite (mg/L as N):	Not Rptd	**Field Dissolved O2 (mg/L):**	
Field Nitrate as N (mg/L):		**Phosphate, TD, (mg/L as P):**	Not Rptd
Ammonia (NH4):	Not Rptd	**Field Chloride (mg/L):**	
PCP's (ug/L):	Not Rptd	**PCB's (ug/L):**	Not Rptd

DISSOLVED Trace Element results (ug/L)

Aluminum (Al):	<30.	**Cadmium (Cd):**	<2.	**Mercury (Hg):**	Not Rptd	**Tin (Sn):**	Not Rptd
Antimony (Sb):	<2.	**Chromium (Cr):**	3.2	**Molybdenum (Mo):**	<10.	**Titanium (Ti):**	<10.
Arsenic (As):	1.0	**Cobalt (Co):**	<2.	**Nickel (Ni):**	<2.	**Thallium (Tl):**	Not Rptd
Barium (Ba):	62.4	**Copper (Cu):**	7.4	**Silver (Ag):**	<1.	**Vanadium (V):**	<5.
Beryllium (Be):	<2.	**Lead (Pb):**	<2.	**Selenium (Se):**	<1.	**Zinc (Zn):**	33.1
Boron (B):	<30.	**Lithium (Li):**	<6.	**Strontium (Sr):**	214.	**Zirconium (Zr):**	<20.
Bromide (Br):	<100.						

Explanation: mg/L = milligrams per Liter, ug/L = micrograms per Liter, meq/L = milliequivalents per Liter, ft = feet, mg/Kg = milligrams per Kilogram, pC/L = picoCuries per Liter
Qualifiers: A = Hydride atomic absorption, E = Estimated due to interference, H = Exceeded holding time, N = Spiked sample recovery not within control limits, P = Preserved sample, S = Method of standard additions, * = Duplicate analysis not within control limits.

Sample Condition: CLEAR

Field Remarks:

Lab Remarks:

Note: In correspondence, please refer to Lab Number: 1997Q0217

Print Date: 31-Dec-98

Appendix B

GW 4

081 08N 20W 30 CCC 053734

not Coded

File No.

TRIPLICATE

T 8 N R 20 W MM

County Ravalli

RECEIVED
JAN 17 1964
Montana Bureau of
Mines and Geology

STATE OF MONTANA
ADMINISTRATOR OF GROUNDWATER CODE
OFFICE OF STATE ENGINEER

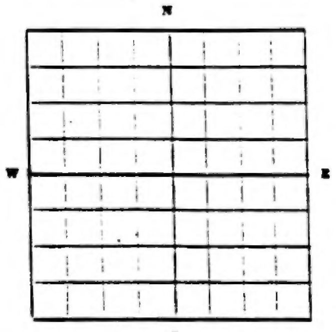
Declaration of Vested Groundwater Rights

(Under Chapter 237, Montana Session Laws, 1961)

1. School District No. 7 (Name of Appropriator) of (Address) Victor (Town)

County of Ravalli State of Montana

have appropriated groundwater according to the Montana laws in effect prior to January 1, 1962, as follows:



LJB 9/94

SW SE SW

30 &

¼ Sec. 31 T. 8N R. 20W

Indicate point of appropriation and place of use, if possible. Each small square represents 10 acres.

2. The beneficial use on which the claim is based all school purposes and irrigation of lawn, playground and football field

3. Date or approximate date of earliest beneficial use; and how continuous the use has been for irrigation - approx. 1926 Use - constant

4. The amount of groundwater claimed (in miner's inches or gallons per minute) 50 gallons per minute

5. If used for irrigation, give the acreage and description of the lands to which water has been applied and name of the owner thereof approx. 6½ acres - Blocks 1-16, & 36 Located [illegible] in lots 3 & 4, Sec. 30; NE¼ of NW¼ in lot 1, Sec. 31, Township 8N Range 20 W.

6. The means of withdrawing such water from the ground and the location of each well or other means of withdrawal electric pump - well located in central schoolyard court

7. The date of commencement and completion of the construction of the well, wells, or other works for withdrawal of groundwater present well - Jan., 1957

8. The depth of water table approx. 25 ft.

9. So far as it may be available, the type, size and depth of each well or the general specifications of any other works for the withdrawal of groundwater drilled 5" - 70 ft.

10. The estimated amount of groundwater withdrawn each year 6 million gallons each year

11. The log of formations encountered in the drilling of each well if available sand, clay and gravel

12. Such other information of a similar nature as may be useful in carrying out the policy of this act, including reference to book and page of any county record see County records Drilling of well done by Norman Ray of Hamilton, Mont. now owned by Gerald Quigley.

Signature of Owner School Dist. No. 7 & Joy B. Clark, Clk.

Date Dec. 30, 1963

PE

LAB 95GC190

Victor 7½' Quad

Three copies to be filed by the owner with the County Clerk and Recorder of the county in which the well is located.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; Triplicate to the School of Mines and Quadruplicate for the Appropriator.

M:58061

WELL #1

FORM NO. 603 (R 5-86)

WELL LOG REPORT

File No. 2102

State law requires that the Bureau's copy be filed by the water well driller within 60 days after completion of the well.

1. WELL OWNER
Name Victor School Dist #7

2. CURRENT MAILING ADDRESS
495 4th Ave
Victor, MT 59875

3. WELL LOCATION
___ ¼ SE ¼ SW ¼ Section 30
Township 8 N/S Range 20 E/W County Ravalli
Gov't Lot ___, or Lot ___, Block ___
Subdivision Name ___
Tract Number ___

4. PROPOSED USE: Domestic ☒ Stock ☐ Irrigation ☐
Other ☐ specify ___

5. TYPE OF WORK:
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☒
Reconditioned ☐ Rotary ☒ Jetted ☐

6. DIMENSIONS: Diameter of Hole
Dia. 10 5/8 in. from 0 ft. to 25 ft.
Dia. 6 3/4 in. from 25 ft. to 120 ft.
Dia. ___ in. from ___ ft. to ___ ft.

7. CONSTRUCTION DETAILS:
Casing: Steel Dia. 6" I.D. from +18" ft. to 120 ft.
Threaded ☐ Welded ☒ Dia. ___ from ___ ft. to ___ ft.
Type A53B Wall Thickness .250
Casing; Plastic Dia. ___ from ___ ft. to ___ ft.
Weight ___ Dia. ___ from ___ ft. to ___ ft.
PERFORATIONS: Yes ☐ No ☒
Type of perforator used ___
Size of perforations ___ in. by ___ in.
___ perforations from ___ ft. to ___ ft.
___ perforations from ___ ft. to ___ ft.
___ perforations from ___ ft. to ___ ft.
SCREENS: Yes ☐ No ☒
Manufacturer's Name ___
Type ___ Model No. ___
Dia. ___ Slot size ___ from ___ ft. to ___ ft.
Dia. ___ Slot size ___ from ___ ft. to ___ ft.
GRAVEL PACKED: Yes ☐ No ☒ Size of gravel ___
Gravel placed from ___ ft. to ___ ft.
GROUTED: To what depth? 20+ ft. 1150±
Material used in grouting Bentonite

8. WELL HEAD COMPLETION:
Pitless Adapter ☐ Yes ☒ No

9. PUMP (if installed)
Manufacturer's name ___
Type ___ Model No. ___ HP. ___

10. WELL TEST DATA
The information requested in this section is required for all wells. All depth measurements shall be from the top of the well casing.

All wells under 100 gpm must be tested for a minimum of one hour and provide the following information:
a) Air X Pump ___ ___ Bailer ___
b) Static water level immediately before testing ___ ft. If flowing, closed-in pressure ___ psi. ___ gpm. Flow controlled by: ___ valve, ___ reducers, ___ other, (specify) ___
c) Depth at which pump is set for test ___
d) The pumping rate: 125 gpm.
e) Pumping water level ___ ft. at ___ hrs. after pumping began.
f) Duration of test: Pumping time 2 hrs.
g) Recovery time ___ hrs.
h) Recovery water level ___ ft. at ___ hrs. after pumping stopped.

Wells intended to yield 100 gpm or more shall be tested for a period of 8 hours or more. The test shall follow the development of the well, and shall be conducted continuously at a constant discharge at least as great as the intended appropriation. In addition to the above information, water level data shall be collected and recorded on the Department's "Aquifer Test Data" form.

NOTE: All wells shall be equipped with an access port ½ inch minimum or a pressure gauge that will indicate the shut-in pressure of a flowing well. Removable caps are acceptable as access ports.

11. WAS WELL PLUGGED OR ABANDONED? ___ Yes X No
If yes, how? ___

12. WELL LOG

Depth (ft.) From	To	Formation
0	8	Top Soil Sand
8	65	Sand Gravel
65	75	Sand & Clay mix
75	90	Fine Sand and Gravel
90	95	Soft Clay w/sand
95	120	Sand, Gravel Layers
	TD	

ATTACH ADDITIONAL SHEETS IF NECESSARY

13. YELLOWSTONE CLOSURE AREA: WATER TEMPERATURE ___

14. DATE COMPLETED 25 Sep 96

15. DRILLER/CONTRACTOR'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

16 Nov 96
Date

Martin WELL Drilling
Firm Name

P.O. Box 500 Hamilton
Address

Signature 524
License No.

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION **DNRC**
1520 EAST SIXTH AVENUE P.O. BOX 202301 HELENA, MONTANA 59620 - 2301 444-6510

WELL #2 (page 1)

WELL LOG REPORT

1. WELL OWNER
Name Victor School Dist #2

2. CURRENT MAILING ADDRESS
425 4th Ave
Victor, MT 59875

3. WELL LOCATION
___ ¼ SE ¼ SW ¼ Section 30
Township 8 N/S Range 20 E/W County Ravalli
Govn't Lot ___, or Lot ___, Block ___
Subdivision Name ___
Tract Number ___
Latitude ___ Longitude ___

4. PROPOSED USE: Domestic ☒ Stock ☐ Irrigation ☐
Other ☐ specify ___

5. TYPE OF WORK:
New well ☐ Method: Dug ☐ Bored ☐
Deepened ☒ Cable ☐ Driven ☒
Reconditioned ☐ Rotary ☒ Jetted ☐

6. DIMENSIONS: Diameter of Hole
Dia. 6 5/8 in. from 120 ft. to 138 ft.
Dia. ___ in. from ___ ft. to ___ ft.
Dia. ___ in. from ___ ft. to ___ ft.

7. CONSTRUCTION DETAILS:
Casing: Steel Dia. 6 in. from +1.8' ft. to 138 ft.
Threaded ☐ Welded ☒ Dia. ___ in. from ___ ft. to ___ ft.
Type A53B Wall Thickness ___
Casing: Plastic Dia. ___ in. from ___ ft. to ___ ft.
Threaded ☐ Welded ☐ Dia. ___ in. from ___ ft. to ___ ft.

PERFORATIONS: Yes ☒ No ☐
Type of perforator used Air Perf
Size of perforations 1/4 in. by 2 in.
8 perforations from 130 ft. to 135 ft.
___ perforations from ___ ft. to ___ ft.
___ perforations from ___ ft. to ___ ft.

SCREENS: Yes ☐ No ☒
Manufacture's Name ___
Type ___ Model No. ___
Dia. ___ Slot size ___ from ___ ft. to ___ ft.
Dia. ___ Slot size ___ from ___ ft. to ___ ft.

GRAVEL PACKED: Yes ☐ No ☒ Size of gravel ___
Gravel placed from ___ ft. to ___ ft.

GROUTED: To what depth? 35 ft.
Material used in grouting Bentonite 36.21.654-4

8. WELL HEAD COMPLETION:
Pitless Adapter Yes ☐ No ☒

9. WELL TEST DATA
The information requested in this section is required for all wells. All depth measurements must be from the top of the well casing.
All wells under 100 gpm must be tested for a minimum of one hour and provide the following information:

a) Air X Pump ___ Bailer ___
b) Static water level immediately before testing 15 ft. If flowing; closed-in pressure ___ psi ___ gpm.
c) Pumping level after one hour ___ ft.
d) Recovery level ___ ft. Time of recovery ___ min/hrs.
e) Pumping rate 40 gpm.

Wells intended to yield 100 gpm or more shall be tested for a period of 8 hours or more. The test shall follow the development of the well, and shall be conducted continuously at a constant discharge at least as great as the intended appropriation. In addition to the above information, water level data shall be collected and recorded on the Department's "Aquifer Test Data" form.
NOTE: All wells shall be equipped with an access port 1/2 inch minimum or a pressure gauge that will indicate the shut-in pressure of a flowing well. Removable caps are acceptable as access ports.

10. PUMPING TEST DATA
a) Static level immediately before testing 15 ft.
b) Depth at which pump is set for test 130 ft.
c) Pumping rate 40 gpm.
d) Maximum drawdown ___ ft.
e) Duration of test: pumping time 2 hrs/~~min~~
recovery time ___ hrs/min
f) Recovery level ___ ft.
g) Duration of time to recovery level ___ hrs.

11. PUMP INSTALLATION INFORMATION
Installation depth ___
Actual pumping rate ___
Manufacturer's name ___
Type ___ Model No. ___ H.P. ___

12. WAS WELL PLUGGED OR ABANDONED? Yes ☐ No ☒
If yes, how? ___

13. WELL LOG

Depth (ft.) From	To	Formation
120	126	Clay
126	128	DG quartz Sand w/B
128	130	Clay
130	135	DG quartz Sand w/B
135	138	Soft Clay w/ pebble Sand ←
138	142	DG water w/B
142	152	Soft Clay lignite
152	157	Soft Clay w/Sand
	TD	

☐ ADDITIONAL SHEETS ATTACHED

14. YELLOWSTONE CLOSURE AREA: WATER TEMPERATURE ___

15. DATE COMPLETED July 15 98

16. DRILLER/CONTRACTOR'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

Date 15 Jul 98
Martin Well Drilling
Firm Name
P.O. Box 417 Hamilton
Address
Signature
524
License No

MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
48 N. LAST CHANCE GULCH P.O. BOX 201601 HELENA, MT 59620-1601 444-6610

WELL #2 (page 2)

State law requires that the Bureau's copy be filed by the water well driller within 60 days after completion of the well.

1. WELL OWNER
Name VICTOR SCHOOL

2. CURRENT MAILING ADDRESS
425 4TH AVE.
VICTOR, MT. 59875

3. WELL LOCATION
SE ¼ SE ¼ SE ¼ Section 25
Township ____ N/S Range ____ E/W County RAVALLI
Gov't Lot ____, or Lot ____, Block ____
Subdivision Name VICTOR TOWNSITE
Tract Number ____

4. PROPOSED USE: Domestic ☐ Stock ☐ Irrigation ☒
Other ☐ specify ____

5. TYPE OF WORK:
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

6. DIMENSIONS: Diameter of Hole
Dia. 6 in. from +2 ft. to 38 ft.
Dia. ____ in. from ____ ft. to ____ ft.
Dia. ____ in. from ____ ft. to ____ ft.

7. CONSTRUCTION DETAILS:
Casing; Steel Dia. ____ from ____ ft. to ____ ft.
Threaded ☐ Welded ☒ Dia. 6" from +2 ft. to 38 ft.
Type 17.2 Wall Thickness ¼"
Casing; Plastic Dia. ____ from ____ ft. to ____ ft.
Weight ____ Dia. ____ from ____ ft. to ____ ft.
PERFORATIONS: Yes ☒ No ☐
Type of perforator used TORCH
Size of perforations 5 in. by 5/32 in.
____ perforations from 30 ft. to 35 ft.
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.
SCREENS: Yes ☐ No ☒
Manufacturer's Name ____
Type ____ Model No. ____
Dia. ____ Slot size ____ from ____ ft. to ____ ft.
Dia. ____ Slot size ____ from ____ ft. to ____ ft.
GRAVEL PACKED: Yes ☐ No ☒ Size of gravel ____
Gravel placed from ____ ft. to ____ ft.
GROUTED: To what depth? 18 ft.
Material used in grouting BENTONITE

8. WELL HEAD COMPLETION:
Pitless Adapter ☐ Yes ☒ No

9. PUMP (if installed)
Manufacturer's name ____
Type ____ Model No. ____ HP. ____

10. WELL TEST DATA
The information requested in this section is required for all wells. All depth measurements shall be from the top of the well casing.

All wells under 100 gpm must be tested for a minimum of one hour and provide the following information:

a) Air ____ Pump ____ Bailer XX
b) Static water level immediately before testing 4 ft. If flowing; closed-in pressure ____ psi. ____ gpm. Flow controlled by: ____ valve, ____ reducers, ____ other, (specify) ____.
c) Depth at which pump is set for test 35
d) The pumping rate: 100 gpm.
e) Pumping water level 18 ft. at 2 hrs. after pumping began.
f) Duration of test: Pumping time 2 hrs.
g) Recovery time 5 MINS hrs.
h) Recovery water level 4 ft. at 5 MIN hrs. after pumping stopped.

Wells intended to yield 100 gpm or more shall be tested for a period of 8 hours or more. The test shall follow the development of the well, and shall be conducted continuously at a constant discharge at least as great as the intended appropriation. In addition to the above information, water level data shall be collected and recorded on the Department's "Aquifer Test Data" form.

NOTE: All wells shall be equipped with an access port ½ inch minimum or a pressure gauge that will indicate the shut-in pressure of a flowing well. Removable caps are acceptable as access ports.

11. WAS WELL PLUGGED OR ABANDONED? ____ Yes X No
If yes, how? ____

12. WELL LOG

Depth (ft.) From	To	Formation
0	2	TOP SOIL
2	38	SAND & GRAVEL
		WATER BEARING

ATTACH ADDITIONAL SHEETS IF NECESSARY

13. DATE COMPLETED 06/13/93

14. DRILLER/CONTRACTOR'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

07/20/93
Date

ESLINGER DRILLING & PUMP SERVICE
Firm Name

897 MC WILLIAMS DRIVE CORVALLIS, MT.
Address

Randy L Mathews WWD-21
Signature License No.

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION
1520 EAST SIXTH AVENUE HELENA, MONTANA 59620-2301 444-6610
DNRC

IRRIGATION WELL

Appendix C

7.0 Multiple Well Capture Zone Module (MWCAP)

7.1 Capabilities

MWCAP is designed to provide efficient delineation of steady-state, time-related and hybrid capture zones for one or more pumping wells in homogeneous aquifers. Each well specified may be operating in an aquifer without a lateral boundary (an areally infinite aquifer), or in an aquifer with a stream or a barrier boundary (semi-infinite aquifer). If a stream or barrier boundary is present, the angle of ambient flow in relation to the boundary, as well as the orientation of the boundary itself, may be completely arbitrary. MWCAP requires that stream or barrier boundaries be represented by straight lines in plan view.

Although multiple wells within a study area may be specified, MWCAP assumes that the wells operate independently of one another. Therefore, physical processes such as increased drawdown due to well interference effects are ignored.

MWCAP is very efficient due to the small number of pathlines required to delineate steady-state or hybrid capture zones. If a stream boundary is present and the capture zone intersects the stream, the zone of induced recharge from the stream to the well will be delineated automatically. MWCAP can also be used to delineate time-related capture zones.

7.2 Assumptions and Limitations

Capture zones delineated using MWCAP are valid for fully penetrating pumping wells screened in aquifers that are essentially homogeneous. Ground-water flow must be two-dimensional in the areal x-y plane, and therefore the aquifer may be confined or unconfined if the drawdown-to-initial saturated thickness ratio is small (less than about 0.1). A steady-state ground-water flow field is assumed.

If a stream or a barrier boundary is present, the boundary is assumed to be linear and fully penetrating. The latter assumption is often violated in cases where stream boundaries exist. The effect of a partially penetrating stream may be an important one and each application should be examined on a site-by-site basis. In general, the greater the depth and breadth of the stream in relation to the aquifer thickness, the more valid the fully penetrating stream assumption. Also, stream boundary partial penetration effects decrease as the distance from the stream to the well increases. The stream and the aquifer are assumed to be in perfect hydraulic connection: the effects of a "clogging layer" between the streambed and the aquifer are not considered.

If, in actuality, the stream is partially penetrating and/or there is a clogging layer of fine grained material that lines the streambed, the capture zones obtained using MWCAP will be smaller than the "true" capture zones. The amount of error incurred will be dependent upon the degree to which the above assumptions are violated.

Capture zones for multiple pumping wells within a study area may be delineated with one run of MWCAP, but each well is assumed to operate independently of every other well. Therefore, each well may have a potentially unique set of input parameters. The effects of well interference (increased drawdown due to overlapping cones of depression) are neglected.

7.3 Input Requirements

The input requirements for MWCAP are outlined in Table 7.1. Note that the well-specific parameters must be input for each well specified in the study area.

Table 7.1

Input Requirements for MWCAP Module

Program Variable	Description
For each problem --	
IUNIT:	Default units of input parameters (feet and days or meters and days)
NWELL:	Number of pumping wells for which capture zones are to be delineated
XMIN:	Minimum x-coordinate of study area (ft or m)
XMAX:	Maximum x-coordinate of study area (ft or m)
YMIN:	Minimum y-coordinate of study area (ft or m)
YMAX:	Maximum y-coordinate of study area (ft or m)
DLMAX:	Largest allowable step length, $d\ell$ (see section 4.1)
For each well (I=1, NWELL) --	
XWELL(I):	x-coordinate of well (ft or m)
YWELL(I):	y-coordinate of well (ft or m)
QWELL(I):	Well discharge rate[a] (ft^3/day or m^3/d)
TRAN(I):	Transmissivity of the aquifer (ft^2/d or m^2/d)
GRAD(I):	Regional hydraulic gradient (ft/ft or m/m)
ANGLE(I):	Angle of ambient ground-water flow (0-360°)
POR(I):	Aquifer porosity (dimensionless)
THICK(I):	Aquifer saturated thickness (ft or m)
IBOUND(I):	Associated boundary type (no boundary, stream boundary, or barrier boundary)
DSW(I):	Perpendicular distance from stream or barrier boundary to the well (ft or m)
THETA(I):	Orientation of stream or barrier boundary (0-360°)
ICZTYP(I):	Capture zone type option (steady-state, time-related, or hybrid)
TMCZ(I):	Time value associated with capture zone (days); time-related and hybrid capture zones only
NSTLIN(I):	Number of pathlines to be computed for the well in addition to pathlines delineated automatically by the code
ICZPLT(I):	Flag indicating if capture zone boundary is to be plotted

[a] The sign (+,-) of the discharge rate does not need to be specified.

The MWCAP formulation is based on the uniform flow equations presented by Todd (1980).

The downgradient stagnation point (place in the ground-water flow field where ground water is not moving) is calculated using the following equation:

$-X_L = Q/(2\pi Kbi)$

Q = discharge rate of the well (ft^3/day)
π = 3.1416 (constant)
K = hydraulic conductivity (ft/day)
b = aquifer thickness (ft)
i = hydraulic gradient (dimensionless)

The upgradient time of travel distance is calculated using the following equation:

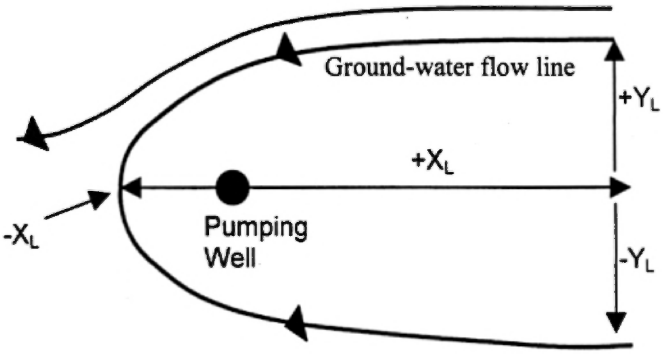
$+X_L = Kit/n$

X = distance from well to the time of travel limit (ft)
K = hydraulic conductivity (ft/day)
i = hydraulic gradient (dimensionless)
t = time of travel (days)
n = effective porosity

The boundary limit:

$Y_L = +/- Q/2Kbi$

Y_L = distance from well to the time of travel (days)
K = hydraulic conductivity (ft/day)
b = aquifer thickness (ft)
i = hydraulic gradient (dimensionless)
t = time of travel (days)
n = effective porosity (dimensionless)



Todd, D.K. 1980. Ground Water Hydrology. John Wiley and Sons Inc. New York, New York. 336 pp.

Appendix D

DEPARTMENT OF ENVIRONMENTAL QUALITY
METCALF BUILDING
POB 200901
Helena, MT 59601-0901

Preliminary Assessment of Groundwater Sources that may be under the Direct Influence of Surface Water

SYSTEM NAME VICTOR SCHOOL PWS ID# 02134

SOURCE NAME WELL #1 (SHALLOW) COUNTY RAVALLI

DATE 11/18/98 NC NTNC C POPULATION__________

Index

Points

A. TYPE OF STRUCTURE (CIRCLE ONE)

[✓ Well]..GO TO SECTION B
Spring.. 40
Infiltration Gallery............................ 40

B. HISTORICAL PATHOGENIC ORGANISM CONTAMINATION

History or suspected outbreak of *Giardia,* or other pathogenic organisms associated with surface water, with current system configuration.................... 40
No history or suspected outbreak of *Giardia*.......... [✓ 0]

C. HISTORICAL MICROBIOLOGICAL CONTAMINATION (Circle all that apply)

Record of acute MCL violations of the Total Coliform Rule over the last 3 years (circle the one that applies)
No violations................................ [✓ 0]
One violation................................ 5
Two violations............................... 10
Three violations............................. 15

Record of non-acute MCL violations of the Total Coliform Rule over the last 3 years (circle the one that applies)
One violation or less........................ [✓ 0]
Two violations............................... 5
Three violations............................. 10

DHES-verified complaints about turbidity............. 5

D. HYDROGEOLOGICAL FEATURES (Circle all that apply)

Horizontal distance between a surface water and the source*
greater than 500 feet............................ [✓ 0]
250-500 feet..................................... 5
100-250 feet..................................... 10
less than 100 feet............................... 15

E. WATER CONSTRUCTION (Circle all that apply)

Unknown well construction........................ 30

Poorly constructed well (uncased, or casing not sealed to depth of at least 18 feet below land surface), or casing construction is unknown 15

In wells tapping unconfined or semiconfined aquifers, depth below land surface to top of perforated interval or screen
great than 100 feet.............................. 0
50 -100 ft....................................... [✓ 5]
25 - 50 ft....................................... 10
0 - 25 ft.. 15
unknown.. 15

D. WELL INTAKE CONSTRUCTION

Unknown intake construction...................... [✓ 25]

In wells tapping unconfined or semiconfined aquifers, depth to static water level below land surface
greater than 100 feet............................ 0
50 - 100 ft...................................... 5
0 - 50 ft.. [✓ 10]
unknown.. 10

Poor sanitary seal, seal without acceptable material, or unknown seal type........................ 15

ANALYST Camela Carstarphen TOTAL SCORE 40

PRELIMINARY ASSESSMENT DETERMINATION (circle the one that applies)

I) [✓ PASS:] Well is classified as groundwater.
II) FAIL: Well must undergo further GWUDISW determination.
III) FAIL: Spring or infiltration gallery; must undergo futher GWUDISW determination.
IV) FAIL: Well will Pass if intake construction deficiencies

DEPARTMENT OF ENVIRONMENTAL QUALITY
METCALF BUILDING
POB 200901
Helena, MT 59601-0901

Preliminary Assessment of Groundwater Sources that may be under the Direct Influence of Surface Water

SYSTEM NAME VICTOR SCHOOL PWS ID# 02134

SOURCE NAME WELL #2 (Deep) COUNTY RAVALLI

DATE 11/18/98 NC NTNC C POPULATION__________

Index

Points

A. TYPE OF STRUCTURE (CIRCLE ONE)

[✓ Well]..GO TO SECTION B
Spring.. 40
Infiltration Gallery................................ 40

B. HISTORICAL PATHOGENIC ORGANISM CONTAMINATION

History or suspected outbreak of *Giardia,* or other pathogenic organisms associated with surface water, with current system configuration.................. 40
No history or suspected outbreak of *Giardia*.......... [✓ 0]

C. HISTORICAL MICROBIOLOGICAL CONTAMINATION (Circle all that apply)

Record of acute MCL violations of the Total Coliform Rule over the last 3 years (circle the one that applies)
No violations.................................. [✓ 0]
One violation.................................. 5
Two violations................................. 10
Three violations............................... 15

Record of non-acute MCL violations of the Total Coliform Rule over the last 3 years (circle the one that applies)
One violation or less.......................... [✓ 0]
Two violations................................. 5
Three violations............................... 10

DHES-verified complaints about turbidity............ 5

D. HYDROGEOLOGICAL FEATURES (Circle all that apply)

Horizontal distance between a surface water and the source

greater than 500 feet	[✓ 0]
250-500 feet	5
100-250 feet	10
less than 100 feet	15

E. WATER CONSTRUCTION (Circle all that apply)

Unknown well construction	30
Poorly constructed well (uncased, or casing not sealed to depth of at least 18 feet below land surface), or casing construction is unknown	15

In wells tapping unconfined or semiconfined aquifers, depth below land surface to top of perforated interval or screen

great than 100 feet	[✓ 0]
50 -100 ft	5
25 - 50 ft	10
0 - 25 ft	15
unknown	15

D. WELL INTAKE CONSTRUCTION

Unknown intake construction	25

In wells tapping unconfined or semiconfined aquifers, depth to static water level below land surface

greater than 100 feet	0
50 - 100 ft	5
0 - 50 ft	[✓ 10]
unknown	10
Poor sanitary seal, seal without acceptable material, or unknown seal type	15

ANALYST Camela Carstarphen

TOTAL SCORE 10

PRELIMINARY ASSESSMENT DETERMINATION (circle the one that applies)

I) [✓ PASS:] Well is classified as groundwater.
II) FAIL: Well must undergo further GWUDISW determination.
III) FAIL: Spring or infiltration gallery; must undergo futher GWUDISW determination.
IV) FAIL: Well <u>will</u> Pass if intake construction deficiencies

Appendix E

PWSID Name & ID # 2134

Site ID Number 1,2,3
(Corresponds with map location number)

WHP Region Control

Inventory Person Cam Carstarphen
Ginette Abdo

WHP INVENTORY FORM 1

Site Name Victor School

Owner Name

Site Address

City Victor

Zip Code

County

Phone (406)642-3221

T/R/S

Lat/Long

Property owner (if different from above)

Address

Phone

City

Zip Code

NATURE OF PROPERTY

__Service Business
__Industrial/Mfg.
__Retail Business
__Agricultural
__Residential
✓Government
__Other (describe on back)

LAND USES or POTENTIAL CONTAMINANT SOURCES

Place a check by he letter or number of each land use activity or potential source found at this site. Also place the number or letter and the map locator number (found in upper right corner of this sheet) on the base map to indicate the location of each important land use activity or potential contaminant source. List the chemicals used or stored and approximate volume on back of the form. Also include any other important or useful site information.

__(A) Ag chemical use site
__(B) Brine pit
__(C) Chemical storage
__(D) Chemigation well
✓(E) Chemical mixing/loading site
__(F) Drain ditch/canal
__(G) Feedlot
__(H) Grain storage
__(I) Greenhouse/nursery/orchard
__(J) Highway/county road
__(F) Injection well
__(L) Irrigated land
__(M) Irrigation canal
__(N) Land application of waste site
__(O) Landfill/dump
__(P) Mine/quarry/gravel pit
__(Q) Oil/gas well or exploration borehole
__(R) Pipeline
__(S) Railroad right-of-way
__(T) Salvage yard
__(U) Septic tank
__(V) Service Station dry well/sump
__(W) Storm water drain/sump
__(X) Stream/river/lake/pond
__(Y) Underground storage tank
__(Z) Utility substation/transformer storage
__(1) Wastewater lagoon
__(2) Water well in use
✓ Parking area
✓ Sewer pipes

Site ID Number 1,2,3

CHEMICALS USED OR STORED AT THIS SITE

Map Locator # and Source ID	Land Use	Associated Chemicals
Figure 7 , site ID 1	Sewer lines	bacterial, nitrates
Figure 7 , Site ID 2	Chemical storage	inorganic/organic
Figure 7 , site ID 3	parking area	petroleum productcs

Additional site information

Sketch of Site(optional)

PWSID Name & ID # 2134

Site ID Number 3,4,5
(Corresponds with map location number)

WHP Region Special Protection

Inventory Person Cam Carstarphen
Ginette Abdo

WHP INVENTORY FORM 2

Site Name Victor School
Owner Name ______
Site Address ______
City Victor
Zip Code ______
County ______
Phone (406) 642-3221
T/R/S ______
Lat/Long ______
Property owner (if different from above) ______
Address ______
Phone ______
City ______
Zip Code ______

NATURE OF PROPERTY

__Service Business __Industrial/Mfg. __Retail Business __Agricultural

__Residential __Government __Other (describe on back)

LAND USES or POTENTIAL CONTAMINANT SOURCES

Place a check by he letter or number of each land use activity or potential source found at this site. Also place the number or letter and the map locator number (found in upper right corner of this sheet) on the base map to indicate the location of each important land use activity or potential contaminant source. List the chemicals used or stored and approximate volume on back of the form. Also include any other important or useful site information.

__(A) Ag chemical use site
__(B) Brine pit
__(C) Chemical storage
__(D) Chemigation well
__(E) Chemical mixing/loading site
__(F) Drain ditch/canal
✓(G) Feedlot
__(H) Grain storage
__(I) Greenhouse/nursery/orchard
__(J) Highway/county road
__(F) Injection well
__(L) Irrigated land
__(M) Irrigation canal
__(N) Land application of waste site
__(O) Landfill/dump

__(P) Mine/quarry/gravel pit
__(Q) Oil/gas well or exploration borehole
__(R) Pipeline
__(S) Railroad right-of-way
__(T) Salvage yard
✓(U) Septic tank
__(V) Service Station dry well/sump
__(W) Storm water drain/sump
__(X) Stream/river/lake/pond
__(Y) Underground storage tank
__(Z) Utility substation/transformer storage
__(1) Wastewater lagoon
__(2) Water well in use
✓ Parking area

Site ID Number ______

CHEMICALS USED OR STORED AT THIS SITE

Map Locator # and Source ID	Land Use	Associated Chemicals
Figure 7 , Site ID 3	parking area	petroleum products
Figure 7 , site ID 4	abandoned septic system	nitrate/bacteria
Figure 8 , site ID 5	Animal confinement area	nitrate / bacteria

Additional site information

Sketch of Site (optional)

DEPARTMENT OF ENVIRONMENTAL QUALITY
Waste Management Division
Hazardous Waste Program
(406) 444-1430

FAX # (406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 2209 PHOENIX AVE. HELENA, MONTANA
MAILING ADDRESS: PO BOX 200901 HELENA, MT 59620-0901

October 2, 1995

Myron Burns
Burns Furniture
215 S. Martin
Victor, MT 59875

SUBJECT: September 22, 1995 Hazardous Waste Compliance Inspection

Dear Mr. Burns:

As noted in the enclosed report, I did not observe any violations of applicable hazardous waste management regulations during my recent inspection. As we discussed, disposal of methylene chloride laden rinse water to the soil or water is considered to be unlawful disposal of hazardous waste. Should you elect to restart your furniture stripping operations, you must take any steps necessary to ensure such disposal does not occur.

Sincerely,

Robert Reinke
SHW Specialist

Enclosure

BR\br\Sep95\BF.le

"AN EQUAL OPPORTUNITY EMPLOYER"

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
Waste Management Division
Hazardous Waste Program

FIELD INVESTIGATION REPORT

SITE: Burns Furniture aka The Antique Parlor

EPA ID#: N/A

LOCATION: 215 S. Martin, Victor

DATE & TIME: September 22, 1995 10:30 A.M.

INSPECTION LENGTH: .5 Hr.

CONTACT: Myron Burns

INSPECTION TEAM: Robert Reinke

PURPOSE: Evaluation

REPORT PREPARED BY: Robert Reinke

BACKGROUND: Burns Furniture (BF) submitted a Halogenated Solvent User Registration form in 1990. At that time, BF submitted a written narrative regarding its procedures. Part of this narrative indicated BF discharged water from rinsing methylene chloride from furniture to the surface of the gravel driveway. BF has not notified as a hazardous waste generator. BF had not been previously inspected for hazardous waste management compliance.

RESULTS OF INSPECTION: I went to the address given in the BF Halogenated Solvent User form. The sign in front of the residence showed it to be occupied by The Antique Parlor. A small notice on the front door advised me Myron Burns was selling antiques at a yard sale at 2523 Meridian Road, Victor. I went to that address and met with Myron Burns, owner of BF. Mr. Burns advised me he had not stripped any furniture for over a year and half. He had no foreseeable plans to restart stripping activities. He advised me the site at 215 S. Martin is connected to the Victor city sewer. He also advised me that although he had received the information packet sent by the Hazardous Waste Program to furniture strippers in June of 1995, he had not read the literature.

POLLUTION PREVENTION REVIEW: We discussed methods of capturing and reusing rinsewaters.

RECOMMENDATIONS: No violations noted.

9/28/95
Date of Inspection Report

SHW Specialist

PWSID Name & ID # 2134

Site ID Number 6, 7

(Corresponds with map location number)

WHP Region Protection Region

Inventory Person Cam Carstarphen
Ginette Abdo

WHP INVENTORY FORM 3

Site Name Victor School

Owner Name

Site Address

City Victor

Zip Code

County

Phone (406)642-3221

T/R/S

Lat/Long

Property owner (if different from above)

Address

City

Zip Code

Phone

NATURE OF PROPERTY

__Service Business __Industrial/Mfg. __Retail Business __Agricultural

__Residential ✓Government __Other (describe on back)

LAND USES or POTENTIAL CONTAMINANT SOURCES

Place a check by he letter or number of each land use activity or potential source found at this site. Also place the number or letter and the map locator number (found in upper right corner of this sheet) on the base map to indicate the location of each important land use activity or potential contaminant source. List the chemicals used or stored and approximate volume on back of the form. Also include any other important or useful site information.

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__(D) Chemigation well
__(E) Chemical mixing/loading site
__(F) Drain ditch/canal
__(G) Feedlot
__(H) Grain storage
__(I) Greenhouse/nursery/orchard
✓(J) Highway/county road
__(F) Injection well
__(L) Irrigated land
__(M) Irrigation canal
__(N) Land application of waste site
__(O) Landfill/dump
__(P) Mine/quarry/gravel pit
__(Q) Oil/gas well or exploration borehole
__(R) Pipeline
__(S) Railroad right-of-way
__(T) Salvage yard
__(U) Septic tank
__(V) Service Station dry well/sump
__(W) Storm water drain/sump
__(X) Stream/river/lake/pond
✓(Y) Underground storage tank
__(Z) Utility substation/transformer storage
__(1) Wastewater lagoon
__(2) Water well in use

Site ID Number 6,7

CHEMICALS USED OR STORED AT THIS SITE

Map Locator # and Source ID	Land Use	Associated Chemicals
Figure 8, site ID 6	Highway 93- potential truck spill	petroleum/ hazardous waste
Figure 8, site ID 7	Underground storage tanks	petroleum products

Additional site information

Sketch of Site(optional)

Appendix F

Orville Getz and Gene Morin will be responsible for implementation of the plan. By adopting the Victor Public School Source Water Protection Plan, the school administration agrees to the following responsibilities and obligations:

1) Update the plan every year. This includes identifying changes in land use or potential contaminant sources. Any changes will be submitted to the DEQ every five years to ensure recertification of the source water protection plan.

2) Contact the DEQ's Underground Storage Tank Division every 5 years to determine if there are any new tanks or leaky tanks in the special protection and protection areas.

3) Cement the floor in the storage room where chemicals are stored and keep absorbent materials on site.

3) Contour the surface around the newer well so that there is positive drainage away from the wellhead.

4) Ensure that caution is exercised in the control zone where the sewer lines are located. This may include marking the utility trench location and providing direct oversight when any equipment is working in the area.

5) Inspect both wellheads annually to ensure that the cap on the well is secure and undamaged.

6) Provide the Ravalli County Weed Control personnel a copy of the Source-Water Protection Plan and ask them not to mix chemicals in the special protection region.

7) Provide the Ravalli County Planning Office a copy of the Source-Water Protection Plan so that they are aware of Victor schools groundwater protection efforts and the potential impact that new development may have on groundwater.

8) Publish an article in the local paper to inform the community of Victor Schools Source-Water Protection Plan.

9) Provide the Ravalli County Disaster and Emergency coordinator with a copy of the plan and ask to be notified if a spill occurs that might impact the aquifer. If a spill does occur school administrators will contact DEQ to investigate whether or not special action is required.