

Chapter 6: Environmental Quality & Critical Lands

Introduction

The protection of critical lands in the Hamilton area, and the preservation of environmental quality, benefits the City in many ways.

First, there are many public health and safety issues associated with maintaining environmental quality. In fact, the most compelling reason for regulating land use is to protect life and property.

Second, regulating land uses that pose a threat to air and water quality can reduce public and private costs. For example, protecting groundwater quality can help the City and Hamilton taxpayers avoid the costs associated with water contamination.

Finally, many people move to the Bitterroot Valley and remain here because of the quality of life. Maintaining clean water and air, and protecting critical lands is an important component of the quality of life Hamilton-area residents enjoy.

definition

Critical Lands:

Lands that present problems for sound development, and/or have characteristics such as uniqueness or public value that are worth protecting.

Watercourses

The Bitterroot River, its floodplain, its streams and ditches that crisscross the Hamilton Planning Area are vitally important resources that provide many uses:

- Recreation
- Fish and Wildlife Habitat
- Recharge of the City Wells providing the Municipal Water Supply
- Irrigation
- Flood Control
- Assimilation of Human Wastes
- Urban Stormwater Conveyance

Regulations:

There are a variety of federal, state and local regulations that pertain to rivers, streams and ditches.

Federal: Clean Water Act, Safe Drinking Water Act; Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation and Liability Act; Water Quality Act of 1987; Insecticide, Fungicide and Rodenticide Act.

State of Montana: Stream Protection Act; Stormwater Discharge General Permit; Water Use Act; Natural Streambed and Land Preservation Act; Pollutant Discharge and Elimination Permit; Short-term Exemption from Montana's Surface Quality Water Quality Standards.

City of Hamilton:

Subdivision Regulations: The Hamilton Subdivision Regulations include surface water as an environmental assessment requirement.

Watercourse Issues

As Hamilton continues to grow, its watercourses may face increasing threats. Urbanization, pollutants and changes in riparian and streamside vegetation pose the greatest potential harm. While there are several federal and state programs in

place to protect surface water quality, more could be done at the local level to ensure the health of the Bitterroot River.

The following list contains some additional measures the City could pursue to protect surface water quality:

Enhancing Soil Absorption is most easily achieved by increasing the ratio of vegetated, permeable surfaces to impervious surfaces by using porous paving materials, or diverting runoff into infiltration beds.

Vegetated Buffers: The City could require a buffer between the high water mark of a stream and any proposed structure. Vegetation, natural or landscaped, could be retained within the buffer to slow overland flows and to filter pollutants.

On-site Retention/Detention Ponds: Development proposals could be required to provide on-site retention/detention to accommodate stormwater runoff. Within the ponds, sediment will settle, and pollutants can be filtered. This would keep stormwater runoff out of rivers, streams and ditches.

Encourage Best Management Practices (BMPs): The City could encourage BMPs for construction practices to prevent soil erosion and sedimentation in water resources.

Education: Citizens need to be educated about the dangers of improperly disposing of toxic substances such as cleaner, paints, and solvents. Often these substances end up in water resources through overland flows and septic systems. In addition, citizens could be educated about proper application of lawn chemicals such as fertilizers and pesticides, and proper application of household insecticides, to keep these substances out of the river, streams, ditches, abandoned wells, and the municipal sewer system and water supply.

Encourage the preservation of wetland/riparian areas.

Groundwater

Water tables naturally fluctuate throughout the year due to changes in recharge and discharge rates. Typically, water tables in the Hamilton area are highest during the irrigation season – late spring and early summer.

Groundwater is replenished (known as “recharge”) via surface water percolation down to the aquifers. Some aquifers receive water from a broad, non-specific area. However, many aquifers are fed from specific areas called “recharge zones.”

Hamilton presently utilizes four groundwater wells (Nos. 1, 2, 4, and 6) as its source of municipal water supply. Well No. 7 was drilled in 1999 and has not been put into service. Wells 8 and 9 were drilled in 2002, and will be brought on-line as production wells within the next 3 years. The operating wells are treated with chlorine disinfection.

Hamilton’s Existing Water Supply

Hamilton is the largest community in Ravalli County, and therefore has the most development and consequently, the greatest number of potential contaminant sources.

Agricultural and residential lands dominate land use in the Hamilton area. A small proportion of the area is actually designated as urban land by the U.S. Geological Survey’s analysis. There is a large urban/commercial land use area located along Highway 93 through the Hamilton area.

The agricultural land use, at least for the present, dominates the upland recharge area to the Hamilton wells. Agricultural practices can impact groundwater quality due to land application of chemicals, spills at chemical mixing stations, and concentration of animal wastes. BMPs exist to protect against water contamination from these activities and should be implemented.

definition

Groundwater

can be defined as the water that fills, or saturates, open spaces in soil and rock formations below the water table.



In 1999, Western Groundwater Services issued a *Source Water Protection Plan For Darby, Hamilton And Stevensville, Montana*. The remainder of this section extracts information and recommendations contained in that report.

There are 50 potential contaminant sources identified within the Inventory Region. There are a large number of potential sources related to the automobile industry, either providing repairs to engines or performing bodywork. The Rocky Mountain Lab, several gas stations and two dry cleaners are among the potential sources.

Thirty-four of the 50 sources exist within the Inventory Region of Well No. 6. Well Nos. 2 and 7, located on the east side of town, are essentially free of any potential point sources of contamination. Based on the number of sources and the handling of hydrocarbons and chlorinated solvents, point sources pose a substantial risk to the Hamilton area aquifer. Well No. 6 has the largest risk of contamination by point sources in comparison to the other city wells.

Septic systems are used abundantly to the east and south of Hamilton and may pose a significant threat to groundwater quality. An area designated as a high septic hazard exists within the Inventory Regions of Well Nos. 1 and 2. Inventory regions for the other city wells are either within the sewered area or the lower-density outlying areas of the city. The septic hazard in the Acute Contaminants Inventory Region is considered to be low in general, although there are areas where the hazard is moderate and high. In this area there was also one confined animal feeding area identified. This feeding area is used for about two-days per month related to transportation of cattle.

Stormwater management in the Hamilton area consists of dry wells that discharge directly to groundwater. These facilities are used on public right-of-ways, public lands, and commercial properties. In the event of spilled chemicals entering a dry well, a significant impact to groundwater may occur. US Highway 93 and the Montana Rail Link railroad pass through the center of Hamilton. These transportation routes pose a significant risk to Well Nos. 1, 2, and 6 whenever large quantities of chemicals are transported. The reduced speed limits through the Hamilton area will provide a degree of reduced risk in the Inventory Regions.



From the *Source Water Protection Plan For Darby, Hamilton and Stevensville, Montana, 1999.*

Hamilton Source Water Susceptibility

The results of susceptibility assignments for Hamilton are summarized as follows:

- **Point Sources** There are 20 point sources in the Hamilton inventory that were included in the susceptibility assessment. All of these are associated with underground fuel storage and/or automobile repair. The susceptibility assignments vary depending on location of the facility within source water protection areas. Those sources within the 1-year time-of-travel boundary will generally be assigned High or Very High susceptibility. Sources in the 1 to 3 year zone will be assigned to a lower susceptibility category.
- **Class V Injection Wells** At present, there is no inventory for these types of sources. The US EPA will be conducting an inventory of Class V Injection Wells in Ravalli County in the near future. When this information becomes available, the city of Hamilton should incorporate it into their source inventory.
- **Cropped Agricultural Land** Based on the assumption that all of the agricultural land was cropped, this source type was scored to have High susceptibility. The basis for this score is that 20 to 50% of the inventory areas are cropped agricultural land, which presents a moderate hazard. Without barriers, such as BMPs, which is assumed, the susceptibility is elevated to High. Additional information on agricultural land in the source water protection areas can be used to reassess the susceptibility level for this source type.
- **Septic Systems** The hazard level for septic systems is High, and combined with an absence of barriers, the susceptibility is Very High. Well Nos. 1, 2, 4 and 6 are at the greatest risk from this source type, which can lead to elevated nitrate and pathogens in groundwater. Extension of the city sewer system should be made with



From the *Source Water Protection Plan For Darby, Hamilton and Stevensville, Montana, 1999.*

consideration of reducing the risk posed by this source type.

- **Sanitary Sewers** Leaking sewers, due to proximity to the well sources and location within the 1-year time-of-travel zone, present a High hazard and Very High susceptibility. There is a history for public water wells to be impacted by sewer failures. One of these cases occurred in Missoula several years ago. Hamilton should consider this susceptibility level when considering upgrades and maintenance of the sanitary sewer system.
- **Stormwater Discharge** This source type presents High hazard, and without barriers, is assigned a Very High susceptibility. Hamilton utilizes dry wells, or sumps, to discharge stormwater directly to the subsurface. It is presumed that many sumps exist within the inventory region of the water supply wells. A number of the sump installations are located on commercial properties. Infiltration of direct runoff through the sumps is not anticipated to contaminate groundwater. However, spills or illegal dumps into the sumps can cause a significant problem. Hamilton has addressed the use of sumps, with consideration for spill containment features, in order to reduce the risk from this source type. Fortunately, a storm sewer is located along Highway 93, which helps to protect groundwater in this area from spilled contaminants. This storm sewer discharges at two locations, to the north and west of town, outside of the source water protection areas.
- **Highways/Railroads/Pipelines** Highway 93 and the railroad pass through Hamilton in proximity to Well Nos. 1, 2, and 6. Well No. 1 is within 25-feet of Highway 93. Both the highway and the railroad pass through the 1-year time-of-travel zone for Well Nos. 1 and 6. Chemical spills occurring due to transportation through the area could impact these wells.

Potential New Sources of Water

One is a relatively large area extending east of the City boundaries from Fairgrounds Road to Golf Course Road. The other is a small area located due south of the city center area. Both of these areas overlie the water table aquifer that is tapped by the other existing city wells.

The favorable aspects of these locations for future new water supply wells include the following:

- (1) the south and east locations place wells up-gradient from most point sources;
- (2) the alluvial aquifer is anticipated to be productive in either location, with potential for successful municipal wells; and
- (3) the locations are generally in proximity to existing waterlines, facilitating connection to the water system. It is unlikely, however, that the large area on the east side of town will undergo substantial development in the near future. Septic hazard will increase up until the time when the city extends sewer service into this area.

Storm Water Drainage

Hamilton's current storm drainage system is primarily a subsurface discharge system relying on dry wells installed along many streets in town. However, several City, State and privately owned stormwater collection systems discharging to the Bitterroot River are also installed in Hamilton.

Currently, the main problem with the existing drainage system is that a number of slow-draining dry wells experience significant ponding following rain or snowmelt events.

In the spring of 2002, the City hired Morrison Maierle to analyze Hamilton's storm drainage system and to investigate potential ways to improve that system. The results of their investigation are detailed in the Public Facilities chapter of this Growth Policy.

Flooding

Twenty-five percent (25%) of City of Hamilton is within the 100 year floodplain, with a small portion within the 500 year floodplain.

The Bitterroot River, which carries runoff from large portions of Ravalli County, provides the greatest flood hazard potential for Hamilton. Areas directly adjacent to the Bitterroot River may be expected to be flooded by water ranging from 1 to 3 feet in depth in the event of 100-year storm.

The Federal Emergency Management Agency (FEMA) National Flood Insurance Program's Flood Insurance Map shows that the Federal Government has determined that twenty-five percent (25%) of City of Hamilton in the Federal Insurance Agency Hazard Zone and is subject to widespread flooding.

Noxious Weeds

In most parts of Montana, the spread of noxious weeds has become a considerable environmental problem. Most of the weeds have been brought to Montana from other parts of the country and world. Most of the natural agents – insects and diseases – that normally keep these plants in check in their native environments are not present in Montana, so it is difficult to prevent spreading.

Because of the lack of natural controls, combined with aggressive growth characteristics and unpalatability of many of these weeds, once they get a foothold, they can dominate and replace more desirable native vegetation.

There are a number of negative impacts from noxious weed proliferation:

- ☒ Loss of wildlife habitat;
- ☒ Reduced livestock grazing capacity;
- ☒ Increased soil erosion and topsoil loss;
- ☒ Diminished water quality and fish habitat;
- ☒ Reduced cropland and farm production;
- ☒ Reduced land value and sale potential;
- ☒ Increased cost of controlling weeds.
- ☒ Increased exposure to allergens and irritants.

The City of Hamilton has adopted Ordinance Number 195, which specifically addresses the issues associated with unwanted vegetation and trees. The Ordinance applies to all trees and vegetation located or planted in or near any public area as well as trees, wherever located, which could endanger the life, health or safety of persons or property.



The information on noxious weeds is excerpted from *Idaho's Noxious Weeds*, published by the Ag Publishing Service of the University of Idaho.

There are many things all City residents can do to combat noxious weeds:



- Learn to identify weeds
- Control weeds on your own property
- Avoid driving through weed patches
- Check in and under your vehicle for weeds and weed seeds
- Inform others about weeds
- Reseed areas of disturbed soils
- Alert landowners if you find weeds
- Limit access in weed-infested area
- Minimize soil disturbances

Light Pollution

As Hamilton continues to grow, the issue of light pollution will increasingly become a problem. The purpose of outdoor lighting is to help people to see. Unfortunately, poorly designed and operated lighting may actually have the opposite effect.

There are many components to light pollution:



Glare - creates hazards on the road by obscuring pedestrians and other objects from a driver's view.

Light Trespass – the crossing of a property line by artificial light.

Clutter - too much lighting from a variety of competing sources.

Urban Sky Glow - light pollution can impair our ability to enjoy the beauty of the night sky.

There are many steps that may be taken to address light pollution issues. Some of them are:



Establish light standards for fixtures, bulbs and brightness, to be reviewed during subdivision, site plan and building permitting processes.

Use shields to direct light down when needed.

Use time controls to insure that light is there when needed, and not there when not.

Design and install **lighting to insure that glare is minimized.**

Use the right amount of light for the task- avoid light overkill.

Use energy-efficient light sources.

Noise

Noise is unwanted sound. Noise has become a serious environmental problem because of its adverse effects on people and the environment. People are exposed to various levels and sources of noise every day, which affects them physically and psychologically. The most apparent physiological effect of noise is the temporary, or in some cases, permanent, loss of hearing. Noise can disrupt or interfere with communication and disturb sleep. It can also decrease children's ability to discriminate among different sounds, which affects their learning ability.

The predominant land use in the City is residential, and should also be considered the most noise sensitive. Other noise sensitive land uses include schools, parks, hospitals and churches.

Because Highway 93 bisects Hamilton, traffic noise levels are relatively elevated throughout the City when compared with similarly sized communities. Maintenance of a moderately quiet ambience is important to maintaining the overall atmosphere of the area. The ambient noise levels for the City are lower in areas not adjacent to the Highway 93. Motor vehicle noise will continue to be significant even if each individual vehicle eventually meets state noise standards.

Noise ordinances are designed to protect people from non-transportation related noise sources such as music, machinery and vehicular traffic on private property. Noise ordinances do not apply to motor vehicle noise on public streets or other transportation related noise sources that are preempted by the State or Federal government.

Key Issues

- 1. Transportation Noise Control** - Within the City of Hamilton are a number of transportation related noise sources including one major highway, major arterials and

collector roadways. These sources are the major contributors of noise in Hamilton.

- 2. Community Noise Control for Non-Transportation Noise Sources** - Residential land uses and areas identified as noise sensitive must be protected from excessive noise from non-transportation sources including commercial and construction activities. These impacts are most effectively controlled through the adoption and application of a City Noise Ordinance.
- 3. Noise and Land Use Planning Integration** - Information relative to the existing and future noise environment within the City of Hamilton should be integrated into future land use planning decisions.

Mitigation Measures

The noise sources in Hamilton consist primarily of transportation related noise and other attendant urban sources, such as heating and ventilating equipment, barking dogs, and human activities.

A local government has little direct control of transportation noise at the source. State and Federal agencies have the responsibility to control the noise from the source, such as vehicle noise emission levels.

The most effective method the City has to mitigate all types of noise is through reducing the impact of the noise on the community through the use of noise barriers and site design review. Mitigation through the design and construction of a noise barrier (wall, berm, or combination wall/berm) is the most common way of alleviating noise impacts. The effect of a noise barrier is critically dependent on the geometry between the noise source and the receiver. A noise barrier effect occurs when the "line of sight" between the source and receiver is penetrated by the barrier. The greater the penetration the greater the noise reduction.

Noise/Land Use Compatibility

Noise concerns should be incorporated into land use planning to reduce future noise and land use incompatibility. This is achieved by establishing standards and criteria that specify acceptable limits of noise for various land uses throughout the City. These criteria are designed to integrate noise considerations into land use planning to prevent noise/land use conflicts. The noise/land use compatibility is used to assess the compatibility of proposed land uses with the noise environment.

Air Quality Regulatory Framework

The Federal Clean Air Act, promulgated in 1970 and amended twice thereafter (including the recent 1990 amendment), establishes the framework for modern air pollution control. The Act directs the Environmental Protection Agency (EPA) to establish ambient air standards for six pollutants: Ozone, Carbon Monoxide, Lead, Nitrogen Dioxide, Particulate Matter and Sulphur Dioxide. The standards (NAAQS) are divided into primary and secondary standards; the former are set to protect human health within an adequate margin of safety and the latter to protect environmental values such as plant and animal life.

Sources of emissions can be divided into two major categories: stationary sources and mobile sources. Stationary sources are made up of industrial, manufacturing, commercial, residential and service land use activities, while mobile sources are made up of on-road and other mobile sources. Of the two major emissions sources, mobile sources are the largest contributor to air quality degradation.

The air quality in Ravalli County, and specifically Hamilton results from a unique combination of factors: air flow patterns and emission sources, both local and those located throughout the region.

Pollutants

Six major air pollutants are monitored: sulfur dioxide (SO₂), lead, ozone (O₃), nitrogen dioxide (NO₂), carbon monoxide (CO) and fine particulate matter (PM₁₀). With stringent controls imposed upon industry and leaded gasoline during the last ten years, sulfur dioxide and lead levels have been reduced to safe levels. However, the remaining four air pollutants still exceed safe levels.

The most severe air pollution problem occurs adjacent to Highway 93 and is primarily due to high concentrations of carbon monoxide.

Environmental Quality and Critical Lands Goals and Policies

Flooding:

Goal

Minimize risk and damage from flood hazards within the City.

Policies

Maintain siting and development standards to reduce risk and damage from flood hazards within the City.

Cooperate with local, State and Federal flood control agencies to reduce the potential for flood damage in the City of Hamilton.

Increase public awareness of flood hazards.

Minimize the adverse effects of urbanization upon drainage and flood control facilities

Noise:

Goal

Protect public health and welfare by mitigating existing noise problems and preventing significant degrading of the future acoustic environment.

Policies

Incorporate noise considerations into land use planning decisions.

Establish measures to reduce noise impacts from traffic and other noise sources.

Establish measures to control non-transportation noise impacts.

Air Quality

Goal

Air quality that meets the standards set by the State and Federal governments.

Policies

Coordinate with other jurisdictions in Ravalli County and the surrounding area to establish parallel air quality plans and implementation programs.

Support air quality laws.

Achieve conformance with mandated pollution reduction plans, congestion management plans, and transportation demand management plans.

Promote the use of public transportation and telecommuting within the region in order to further reduce pollutants.

Cooperate with other jurisdictions in Ravalli County to reduce the number of vehicle trips, reduce vehicle miles traveled, and reduce traffic congestion.