

# CHAPTER 5

## CONTAMINANT MANAGEMENT PLAN

This chapter describes Step 4 of the five-step process: the Contaminant Management Plan as required by the Wellhead Protection (WHP) Guidance Document (1998).

### INTRODUCTION

The purpose of the Casper Aquifer Protection Plan (CAPP) is to identify and minimize the existing and potential contaminant threats to the groundwater drinking supply. To meet this goal, effective management of identified sources of potential contamination must be implemented. A wide variety of management strategies can be employed depending on the potential threat to the water supply and public reception of the proposed strategies.

This Contaminant Management Plan (CMP) presents recommendations for managing potential contaminant sources identified within the Casper Aquifer Protection Area (CAPA). The CMP is organized into sections, as follows:

- An overview of potential management strategies and approaches considered;
- Detailed discussion of suggested management strategies for each type of contaminant source; and
- Prioritized management strategies with an implementation schedule.

### OVERVIEW OF POTENTIAL MANAGEMENT STRATEGIES AND APPROACHES

There are a number of alternative management strategies that may be considered for the protection of the Casper Aquifer. These strategies include both regulatory and non-regulatory approaches. Management strategies should be compatible and consistent with other existing management approaches and should not conflict with existing local, state, or federal laws or regulations. Other factors to be considered when selecting management strategies are the cost and benefits of implementation, availability of staff and expertise, and legal considerations such as, property rights. Most importantly, there must be community support for the management strategies and the adopted approach must effectively provide the degree of control or risk

reduction desired for the CAPA. Potential concerns relating to the protection of the Casper Aquifer should be thoroughly considered relative to each prospective management strategy prior to selection to ensure that only the most suitable management controls are implemented. If regulations are adopted, they should directly address the management of existing and future contaminant sources. Regulations should also include enforcement procedures and penalties, and should contain a severability clause to allow a court of law to strike down part of an ordinance without invalidating the whole ordinance. Most successful plans, according to the U.S. Environmental Protection Agency (EPA), include both regulatory and non-regulatory strategies (EPA, 1995).

The following is an overview of the non-regulatory and regulatory management strategies that the Environmental Advisory Committee (EAC), Technical Advisory Committee (TAC), City of Laramie Community Development Department, Albany County Planning Department, and Wittman Hydro Planning Associates, Inc. (WHPA) discussed in developing the recommendations presented in the CMP.

## NON-REGULATORY MANAGEMENT STRATEGIES

### PUBLIC EDUCATION AND INVOLVEMENT

Public education and involvement builds support for regulatory and voluntary protection efforts such as water conservation, waste oil collection, and water-quality monitoring. Education can include press releases; press conferences; newsletters, meeting and workshops; voluntary committee work; class field trips to the municipal water and waste treatment facilities; and brochures on water protection and the hazards of abandoned and uncapped wells. Education may be the most effective and economic means of altering activities that pose a threat to the Casper Aquifer. When people are aware that their activities can pollute groundwater they may be more careful.

### GROUNDWATER MONITORING

Sampling public and private wells throughout the CAPA for selected contaminants through a long-term monitoring effort can aid in assessing water quality in the Casper Aquifer. Monitoring can be used to measure the effectiveness of the CAPP and serve as an early warning system for threats to the aquifer.

### BEST MANAGEMENT PRACTICES (BMPs)

Best management practices are methods to conduct everyday activities in the CAPA in a manner that will minimize the threat of contaminating the groundwater. A list of BMPs for single-family residences is included in Appendix H.



## HOUSEHOLD HAZARDOUS WASTE COLLECTION PROGRAMS

Most of us generate household hazardous waste every day. Items as common as cleaning solvents, paint, batteries, automotive oil and antifreeze can become hazardous waste. Because these items are potentially hazardous, they cannot be placed in a garbage can or waste container. If not properly disposed, these products may contaminate the soil, surface water, and groundwater. Therefore, household hazardous waste collection programs should continue to be made available to the community in order to reduce the quantity of household hazardous waste being disposed improperly. Laramie and Albany County residents must be provided the opportunity to protect their water supply from household wastes and other potential household contaminants.

## LAND ACQUISITION PROGRAMS

The local government can acquire land that is within the CAPA as protection from land uses that may adversely affect the groundwater. Five ways to acquire property within the CAPA are:

### **PURCHASE**

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Purchase of land is perhaps the most effective means of managing potential contaminant sources; however, it can also be the most expensive.

### **DONATION**

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Landowners may donate property to eliminate estate or capital gains taxes and have the ability to deduct, over time, the entire value of the donation from federal and other tax obligations.

### **CONSERVATION EASEMENTS**

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Landowners can grant an easement that protects land from development by dedicating all or a portion of the property to open space or limiting development uses. Landowners retain ownership of the land, voluntarily giving up development rights of their property.

### **LAND EXCHANGES**

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A land exchange is a transaction other than sale that transfers land from one owner to another. In terms of the CAPA, land owned by the City of Laramie would be traded for private land, for which the public's control is deemed important to protecting the Casper Aquifer. The exchange may involve surface or subsurface mineral rights or both. The exchange may include a financial payment to equalize the value of the trade.

### **TRANSFER OF DEVELOPMENT RIGHTS**

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Allows landowners to separate their rights to develop the land, as permitted by zoning, from other rights associated with the land and sell those development rights. A landowner would gain cash value for development rights, yet keep the land in a less-intensive use and continue to enjoy lower property taxes. Transfer of development rights could also include allowing higher density development on one portion of the land while keeping the rest of the land undeveloped.

### **MEMORANDUM OF AGREEMENT OR UNDERSTANDING (MOA/MOU)**

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A legal agreement between two or more parties that guarantee specific action will be taken or certain activities will be prohibited. A MOA/MOU may be expensive to enforce, but offers the advantage of being capable of dealing with site-specific sources of contamination in a timely manner.

## **REGULATORY MANAGEMENT STRATEGIES**

Ordinances/resolutions are the primary form of regulatory management strategies. Ordinances/resolutions are designed to protect the public health and welfare of the community, manage development and land use practices that could contaminate or reduce aquifer recharge, and assure the availability of water supplies for the area. Ordinances/resolutions usually have the same goals as a MOA/MOU and are open to public input and comment. The process of passing an ordinance/resolution, and addressing the diversity of public concerns, may result in considerable time and effort to pass the ordinance. Additionally, once an ordinance/resolution is passed, resources must be devoted to monitoring and enforcement.

Because most of the CAPA is located outside Laramie city limits, the City and County will need to act cooperatively to regulate activities of concern. Potential regulatory management strategies include: zoning regulations, subdivision regulations and codes, and licensing.

## **ZONING REGULATIONS**

Zoning regulations segregate different and possible conflicting activities into different areas of a community and are an effective mechanism for controlling future development. One limitation is that state statutes may provide broad “grandfather” protection for some uses. The current (2007) City and County Comprehensive Plans designate the CAPA as rural growth and agricultural land use, which are the least intensive uses allowed.

### **OVERLAY ZONING**

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A flexible and precise zoning ordinance is a mapped district that sets additional requirements over and above those in the underlying

zoning district. For example, an Aquifer Protection Overlay (APO) zone may be applied to the basic zoning within the City and County that requires site-specific investigations for all proposed developments.

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#### **PROHIBITION OF VARIOUS LAND USES**

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The City and County have identified prohibited land uses in the APO such as gas stations, landfills, and facilities that store or dispose of hazardous materials. A list of prohibited activities can be found in Table 5-1.

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#### **SPECIAL PERMITTING**

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Special permitting may be used within the CAPA to regulate uses and structures which may negatively impact water and land quality, such as underground storage tanks.

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#### **LARGE LOT ZONING**

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Large lot zoning would limit the potential for degrading groundwater quality by reducing the density of buildings and on-site wastewater treatment systems, within the CAPA. Thirty-five acre lots or larger, as dictated by Wyoming State statutes, should be designated as large lot zoning.

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#### **CLUSTER/PLANNED UNIT DEVELOPMENT (PUD) DESIGN**

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Cluster/PUD design allows for an area of small lot development in association with a conservation easement as a way that limits the overall development density to a level consistent with the goal of protecting the Casper Aquifer. Additional benefits of allowing Cluster/PUD designs are reduced costs to the developer, greater flexibility for the developer, and potential to avoid vulnerable features while still maintaining development potential.

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#### **GROWTH CONTROLS/TIMING**

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Limitations on the number of building permits issued annually or an outright development moratorium based on a community's physical and financial capabilities. Using growth controls and timing would help limit the number of septic systems and would allow time for infrastructure to catch up with development.

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#### **PERFORMANCE STANDARDS**

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Establishing "critical" threshold limits as a standard for acceptability (e.g., septic system effluent limits).

## SUBDIVISION REGULATIONS AND CODES

Subdivision regulations fine-tune zoning bylaws, resolutions, and ordinances, and focus primarily on engineering concerns rather than land use. Subdivision regulations may include the following techniques.

### PERFORMANCE STANDARDS

Performance standards may be used to limit the impact of development on water quality. Performance standards could include standards for stormwater runoff, sewage effluent standards, and BMPs that may reduce contaminants that enter stormwater. Performance standards can be enacted during any stage of development including during the site-specific investigations.

### GROUNDWATER IMPACT ASSESSMENT (GIA)

Proposed subdivisions would be required to do a GIA. A GIA describes the existing condition of the groundwater resource and identifies potential effects of the proposed development on the CAPA. A GIA would be required with the initial subdivision review to allow the governing bodies to understand the impacts of the development on the CAPA.

### SITE DESIGN AND OPERATING STANDARDS

To regulate the design, construction, and ongoing operation of various land-use activities by imposing specific physical requirements such as the use of double-walled storage tanks for hazardous materials and to provide standards so that structures will not adversely affect water quality. Groundwater quality can be enhanced through requirements such as vegetated buffer zones, natural landscaping, stringent percent cover standards and alternative roadway designs.

### INSPECTIONS OF SEPTIC SYSTEMS

When construction of an individual sewage disposal system has been completed, except for backfilling, an inspection may be performed. The final inspection will verify that the system is installed in accordance with the regulations and the permit. Existing septic systems also may be inspected at regular intervals.

## LICENSING

Licensing regulations require design and construction activities within an area of special concern be conducted by qualified firms. Qualifications can be established by a state, county or city licensing authority.

#### PROFESSIONAL LICENSING

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The State presently regulates the professions of engineering, geology and architecture in Wyoming.

#### CONSTRUCTION CONTRACTOR LICENSING

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The City of Laramie presently licenses contractors responsible for building construction within the city limits. Similarly, the City and County may license contractors who install and repair on-site wastewater treatment systems and water wells within the CAPA. Design standards and requirements for construction could be communicated to contractors through the licensing process.

## RECOMMENDED MANAGEMENT STRATEGIES FOR POTENTIAL CONTAMINANT SOURCES IDENTIFIED WITHIN THE CASPER AQUIFER PROTECTION AREA

Potential and existing contaminant sources were identified in Chapter 4 of the CAPP. This section describes recommended management strategies for each CAPA Zone and type of potential contaminant source. Implementation of strategies is the responsibility of the Laramie City Council and Albany County Board of Commissioners.

### ZONE 1

A Zone 1, or Accident Prevention Zone, is established around each municipal well and spring area as a 100-foot radius as described in Chapter 3. These zones will be managed to prevent the accidental or purposeful introduction of contaminants into the Casper Aquifer in the immediate vicinity of municipal wells. The City must control and maintain the security of these critical areas.

### ZONE 1 RECOMMENDATIONS

#### PURCHASE OF LAND

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It is recommended that the City of Laramie purchase all land within Zone 1. By purchasing the land, the City of Laramie will be able to control the land use and restrict access to Zone 1. Whenever possible and under certain circumstances, the City should also consider purchasing the land immediately adjacent to Zone 1 areas. Once the land has been purchased, the City should annex the purchased property. Annexation gives the City jurisdictional control over the area.

## ZONING

The amended ordinance (Appendix I) restricts all development, except open space, within Zone 1. Since this area is in close physical proximity to the municipal drinking water wells, it must be protected with strong measures.

## SECURITY

Zone 1 areas should be protected with fencing and padlocked gates with access allowed only for emergency and authorized personnel. Since not all wells are fenced, the highest priority for Zone 1 security should be to fence and secure the Pope Spring wells. Second, the entire Zone 1 area should be fenced for Spur and Turner wellfields rather than the current security which includes fencing of only a small area around the wellheads. Signs should be placed that indicate Zone 1 is a restricted area.

## ZONES 2 AND 3

As required by the Wyoming Department of Environmental Quality (WDEQ), Zone 2 and Zone 3 are designated as the primary and secondary zones of protection, respectively. Conduit flow occurs throughout Zones 2 and 3 as described in Chapter 3 and allows for rapid groundwater flow through interconnected fractures, faults, joints, and dissolution features. Natural drainages in the CAPA also play an important role in groundwater recharge as described in Chapter 3. Due to the conduit flow features and natural drainages throughout Zones 2 and 3, these zones should be managed in the same manner. Currently, these two zones are managed with the same level of protection and this management style should continue. The rest of this section describes management strategies for Zones 2 and 3 and provides a discussion of specific management strategies for specific potential contaminant sources.

## ZONING REGULATIONS

Probably the most important step in protecting the Casper Aquifer is controlling future development. An ordinance or resolution, as discussed previously, provides a mechanism to control future land use development. It is important to control land uses within the CAPA because human activities are often the cause of water-quality degradation.

Albany County and the City of Laramie both have an Aquifer Protection Overlay (APO) Zoning Resolution or Ordinance, respectively. However, due to citizen concerns regarding potential developments within the CAPA, Albany County and the City of Laramie requested that the existing ordinances be reviewed. Upon review, WHPA determined that the regulations should include stronger language to protect the Casper Aquifer. The importance of the Casper Aquifer to both Albany County residents and the City of Laramie necessitates that

*80% of Albany County residents agreed that Albany County should guide development to protect natural resources such as groundwater, floodplains, wetlands, and crucial wildlife habitat – from phone survey conducted by Fairbank, Maslin, Maullin & Associates (2007)*



regulation be incorporated into management strategies. The amended County APO Resolution and City APO Ordinance are found in Appendix I.

## ZONING REGULATIONS RECOMMENDATIONS

### PROHIBITED ACTIVITIES

As the annotated bibliography in Appendix J shows, specific activities and land uses have contributed to groundwater contamination throughout the U.S. It is recommended that the activities and land uses listed in Table 5-1 be prohibited in the CAPA. The list of prohibited activities is unlikely to include all future proposed land development that have the potential to adversely impact water quality in the Casper Aquifer. Therefore, the governing bodies should review all developments within the CAPA.

**TABLE 5-1. RECOMMENDED PROHIBITED ACTIVITIES.**

<b>Prohibited Activity</b> <i>The following activities are prohibited in the APO zone:</i>	<b>Examples of Prohibited Activities</b> <i>The following are examples of businesses or activities which may conduct the prohibited activity.</i>
1. Activities involving any equipment for the storage or transmission of any hazardous material to the extent that it is not pre-empted by federal law.	Petroleum pipelines or gasoline stations.
2. The discharge to groundwater of any waste product.	Any business or facility.
3. Commercial car or truck washes, unless all waste waters from the activity are lawfully disposed of through a connection to a Publicly Owned Treatment Works or centralized wastewater treatment system.	Car or truck washes, detail shops or car dealership.
4. Commercial and home occupation/home business production or refining of chemicals, including without limitation, hazardous materials or asphalt.	Chemical, petroleum, asphalt or pesticide manufacturer.
5. Commercial and home occupation/home business clothes or cloth cleaning service which involves the use, storage, or disposal of hazardous materials, including without limitation, dry-cleaning solvents.	Dry cleaner.
6. Commercial and home occupation/home business generation of electrical power by means of fossil fuels except generation by means of natural gas or propane.	Fossil-fueled electric power producer.
7. Commercial and home occupation/home business production or fabrication of metal products, electronic boards, electrical components, or other electrical equipment involving the use, storage or disposal of any hazardous material or involving metal plating, metal cleaning or degreasing of parts or equipment with industrial solvents, or etching operations.	Metal foundry, metal finisher, metal machinist metal fabricator, metal plating, electronic circuit board, electrical components or other electrical equipment manufacturer.
8. Commercial and home occupation/home business on-site storage of oil, petroleum or gasoline for the purpose of wholesale or retail sale.	Bulk plant.
9. Commercial and home occupation/home business embalming or crematory services which involve the use, storage or disposal of hazardous material, unless all waste waters from the activity are lawfully disposed of through a connection to a Publicly Owned Treatment Works or centralized wastewater treatment system.	Funeral home or crematory.
10. Commercial and home occupation/home business furniture stripping operations which involve the use, storage or disposal of hazardous materials.	Furniture stripper.

<b>Prohibited Activity</b> <i>The following activities are prohibited in the APO zone:</i>	<b>Examples of Prohibited Activities</b> <i>The following are examples of businesses or activities which may conduct the prohibited activity.</i>
11. Commercial and home occupation/home business furniture finishing operations which involve the use, storage or disposal of hazardous materials.	Furniture repair.
12. Storage, treatment, or disposal of hazardous waste permitted under Wyoming law.	Hazardous waste treatment, storage or disposal facility.
13. Commercial and home occupation/home business clothes or cloth cleaning service for any industrial activity that involves the cleaning of clothes or cloth contaminated by hazardous material, unless all waste waters from the activity are lawfully disposed of through a connection to a Publicly Owned Treatment Works or centralized wastewater treatment system.	Industrial laundry.
14. Commercial and home occupation/home business of any biological or chemical testing, analysis or research which involves the use, storage or disposal of hazardous material.	Laboratory: biological, chemical, clinical, educational, product testing or research.
15. Commercial and home occupation/home business pest control businesses which involve storage, mixing or loading of pesticides or other hazardous materials.	Lawn care or pest control service.
16. Commercial and home occupation/home business salvage operations of metal or vehicle parts.	Metal salvage yards, vehicle parts, salvage yards or junk yards.
17. Commercial and home occupation/home business photographic finishing which involves the use, storage, or disposal of hazardous materials.	Photographic finishing laboratory.
18. Commercial and home occupation/home business printing, plate making, lithography, photoengraving or gravure, which involves the use, storage or disposal of hazardous materials.	Printer or publisher.
19. Commercial and home occupation/home business pulp production, which involves the use, storage or disposal of any hazardous materials.	Pulp, paper or cardboard manufacturer.
20. Accumulation or storage of waste oil, anti-freeze or spent lead-acid batteries.	Recycling facility which accepts waste oil, spent anti-freeze or spent lead-acid batteries.
21. Commercial and home occupation/home business production or processing of rubber, resin cements, elastomers or plastic, which involves the use, storage or disposal of hazardous materials.	Rubber, plastic, fabric coating, elastomer or resin cement manufacturer.
22. Storage of pavement de-icing chemicals unless storage takes place within a weather-tight waterproof structure.	Salt or de-icing storage facilities.
23. Commercial and home occupation/home business accumulation, storage, handling, recycling, disposal, reduction, processing, burning, transfer or composting of solid waste.	Solid waste facility or intermediate processing center. Landfill or dumps on residential or commercial property (such as cars, appliances, lawn mowers).
24. Commercial and home occupation/home business finishing or etching of stone, clay, concrete or glass products or painting of clay products which involves the use, storage, or disposal of hazardous materials.	Stone, clay or glass products manufacturer.
25. Commercial and home occupation/home business dying, coating or printing of textiles, or tanning or finishing of leather, which involves the use, storage, or disposal of hazardous materials.	Textile mill, tannery.
26. Commercial and home occupation/home business involving the repair or maintenance of automotive or marine vehicles or internal combustion engines of vehicles, involving the use, storage or disposal of hazardous materials, including solvents, lubricants, paints, brake or transmission fluids or the generation of hazardous wastes.	Vehicle service facilities which may include: new or used car dealership, automobile body repair or paint shop, aircraft repair shop, automobile radiator, or transmission repair; small-engine repair; boat dealer; recreational vehicle dealer; motorcycle dealer; truck dealer; truck stop; diesel service station; automotive service station, municipal garage, employee fleet maintenance garage or construction equipment repair or rental.

<b>Prohibited Activity</b> <i>The following activities are prohibited in the APO zone:</i>	<b>Examples of Prohibited Activities</b> <i>The following are examples of businesses or activities which may conduct the prohibited activity.</i>
27. Commercial and home occupation/home business of on-site storage of hazardous materials for the purpose of wholesale or retail sale.	Wholesale trade, storage or warehousing of hazardous substances, hazardous wastes, pesticides, oil or petroleum.
28. Commercial and home occupation/home business production or treatment of wood, veneer, plywood, or reconstituted wood, which involves the use, storage or disposal of any hazardous material.	Manufacturer of wood veneer, plywood or reconstituted wood products.
29. All Underground Injection Control (UIC) wells except Class V subclasses 5B2, 5B3, 5B4, 5B5, 5B6, 5B7, 5E3, 5E4, and 5E5 and Class V subclasses 5A1 and 5A2, if 5A1 and 5A2 facilities do not use any additives, as defined in WDEQ Chapter 16.	Underground injection control facilities.
30. Water wells which are not capped. Water wells which are not cased at least to the top of the production zone with the annular space sealed from the top of the production zone to the surface, or in accordance with the state engineer's requirements or recommendations, whichever is stricter.	Residential, commercial, or agricultural uses.
31. Application of pesticides and herbicides which do not become non-hazardous within 48 hours of application or which are not applied according to the manufacturer's instructions.	Residential, commercial or agricultural uses.
32. Application of fertilizer at greater than the agronomic uptake rate of the vegetation fertilized.	Residential, commercial or agricultural uses.
33. Commercial and home occupation/home business quarrying and sand and gravel mining unless the operations are conducted pursuant to valid permits issued by the Wyoming Department of Environmental Quality, Bureau of Land Management or other federal or state regulatory agency.	
34. Above ground storage of any hazardous material, including oil and petroleum, unless enclosed in secondary containment.	Agricultural gasoline storage.
35. Installation and use of on-site wastewater treatment systems or septic-systems within Laramie City limits. Installation and use of on-site wastewater treatment systems or septic-systems in densities higher than 1 system per 10 acres in the unincorporated area of the APO.	Residential lots with septic systems or on-site wastewater treatment systems.
36. Commercial and home occupation/home business animal feeding operations where a) animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and b) crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.	Feedlot, concentrated animal feeding operation, stockyards or boarding stable.
37. Commercial and home occupation/home business golf courses or intensely managed turf.	Golf course or driving range.
38. Commercial and home occupation/home business cemeteries.	Cemeteries of all types.

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#### SETBACK FROM VULNERABLE FEATURES

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As discussed in Chapter 3, Site-Specific Investigations, there are several characteristics of the Casper Aquifer that render it vulnerable to contamination. Some of these characteristics are discrete features that should be protected by requiring setbacks. It is recommended that a 100 feet setback from all development be required for the following features:

- Folds, faults, fractures or other evidence of conduit flow that extend to the ground surface.
- Perennial, intermittent, and ephemeral drainages.

#### SITE-SPECIFIC INVESTIGATIONS FOR ALL PROPOSED DEVELOPMENT IN THE APO

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Chapter 3 describes the 13 steps that should be completed for a site-specific investigation. It is recommended that a site-specific investigation be completed for all new development within the APO. The site-specific investigation will enable the City/County governing bodies to identify the potential impacts, if any, that the proposed development may have on the Casper Aquifer.

#### APPROVAL FOR DEVELOPMENT WITHIN THE APO

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It is recommended that the County and City permit development only if the following criteria are met:

1. No vulnerable feature, as described above, exists within 100 feet of the proposed development;
2. The site-specific investigation has been completed and a report of the findings submitted to the appropriate governing body;
3. A professional engineer (the City or County Engineer or other licensed professional engineer), geologist, hydrologist, or other qualified designee who, by experience and/or by training has the required skills in the areas of groundwater evaluation, geologic formation analysis, and the science of contaminant transport, other than the professional that performed the site-specific investigation, must review the site-specific investigation and verify that the proposed development meets the requirements of this ordinance. If review of the site-specific investigation is conducted by anyone other than the City or County Engineer, the City or County may be reimbursed for the cost of the review.

In review of the site-specific investigation, the qualified professional will assess and determine whether the site and development plans

meet the overall objectives of the Casper Aquifer Protection Plan and the ordinance or resolution, whichever is applicable.

The City and County should retain a qualified consultant or staff to conduct reviews of development proposals within the CAPA. These reviews will provide the City and County staff, City Planning Commission, Albany County Planning and Zoning Commission, County Commissioners, and City Council with the rational required to either permit or not permit proposed developments. As discussed in Chapter 3, site-specific investigations will ensure that the potential risks to the Casper Aquifer are identified and that the developer is integrating aquifer protection into the proposed development. Upon completion of a site-specific investigation, the City and County will use the retained consultant to assess the potential impact of the proposed development on the Casper Aquifer. These reviews should consider the CAPP and applicable ordinances/resolutions. While the reviews would be conducted using local government funds, the government entities may be able to recover the costs to review development plans through increased application fees or other measures. Development within the CAPA should include BMPs that are proven effective for the local conditions such as conduit flow, thin permeable soils, and an arid climate.

The County and the City may also attach conditions to the approval of a development to ensure protection of groundwater quality. Conditions may include further evaluation, reasonable technical improvements, monitoring or other mitigation measures deemed necessary.

#### DESIGN STANDARDS FOR ON-SITE WASTEWATER TREATMENT/SEPTIC SYSTEMS

It is recommended that the City and County require, by regulation, that installation, design, repair, and removal of septic systems located within the CAPA be in accordance with plans and specifications prepared by and certified by a professional engineer skilled in the science of wastewater disposal and licensed to practice in the State of Wyoming.

Septic systems should be pumped out at least every five years or on a schedule recommended by a City/County licensed wastewater pumper/hauler. Pumping will prevent solids, oils, and grease from building up to a level where these waste materials will be washed out into the leach field and/or clog leach field lines. A database regarding the septic systems and their pumping and inspection schedules should be maintained and updated by the City and County GIS to maintain records and track schedules.

It is recommended that the County and City maintain authority to inspect new and replaced septic systems and leach fields, prior to backfilling, to verify proper installation and confirm design information stated in the permit application. Inspections should also occur at least once every three years to ensure that baffles are operating correctly, that no leaks are occurring, and to check the levels of sludge and scum in the tank.

#### CONNECTION TO MUNICIPAL OR DISTRICT SEWAGE COLLECTION LINES

For those existing areas where septic systems are currently in use, it is recommended that the East Laramie/Albany County Wastewater Feasibility Study be conducted (see section entitled East Laramie/Albany County Wastewater Feasibility Study). Upon completion of the study if municipal or district sewage collection lines are the recommended course of action the following terms should apply.

- No one-site wastewater treatment systems should be used one year after installation of a municipal sewer collection line in a right of way or easement that is contiguous to the property on which the system is located.
- No one-site wastewater treatment systems should be used one year after the inclusion of the property containing the on-site system in a district connected to the City of Laramie's wastewater treatment system or another wastewater treatment facility and if the sewage collection line is in a right of way or easement that is contiguous to the property.

The provisions for connecting to a City of Laramie sewage collection line in Albany County should be consistent with the existing City of Laramie-Albany County 201 Wastewater Agreement.

#### PRE-EXISTING NONCONFORMING USES

A pre-existing nonconforming use is a use prohibited by the regulation but which was in place prior to the property being included in the APO zone. Pre-existing nonconforming uses may continue in the same location but should not be expanded in size or scope. If the pre-existing nonconforming use is damaged, they may be repaired and resume at the same location, size, and scope, provided that after the repairs are complete, the best available control technology is in place to prevent hazardous materials from entering the Casper Aquifer.

A pre-existing nonconforming use may be expanded if the following conditions are met.

- A site-specific investigation is completed.
- The development is approved by the governing body.
- Control technology built into the expansion will prevent an increased risk to the Casper Aquifer.

Once a pre-existing nonconforming use is included in the APO, it is recommended that the following conditions be required.

- Store hazardous material in an enclosed structure or under a roof that eliminates stormwater entry to the containment area.
- Provide floors within a structure where hazardous material is stored, coated to protect the surface of the floor from deterioration due to spillage of any such material. A structure which may be used for storage or transfer of hazardous material should be protected from stormwater run-on and ground water intrusion.
- Store hazardous material within an enclosed impermeable containment area which is capable of containing at least the volume of the largest container of hazardous material present in the area or 110% of the total volume of all such containers in the area, whichever is larger, without overflow of released hazardous material from the containment area.
- Store hazardous material in a manner that will prevent the contact of chemicals with any materials so as to create a hazard of fire, explosion or generation of toxic substances.
- Store hazardous materials only in containers that have been certified by a state or federal agency or the American Society of Testing Materials as suitable for the transport or storage of the material.
- Store all hazardous material in an area secured against entry by the public, except items offered for retail sale in their original unopened containers.
- Not use, maintain or install floor drains, dry wells or other infiltration devices or appurtenances which allow the release of wastewater to the ground water.
- Not discharge any substance or material to the ground in the APO zone unless the discharge is permitted by law.

### PROPER PLUGGING AND ABANDONMENT OF UNUSED WELLS

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Improperly abandoned wells provide a direct conduit to the Casper Aquifer. If a contaminant were introduced into the well, it would immediately enter the groundwater system.

It is recommended that all wells, including but not limited to groundwater pumping wells and monitoring wells, that are no longer in use by the owner be properly plugged and abandoned in accordance with Chapter 11, Section 70, Part G of the Wyoming Department of Environmental Quality Rules and Regulations.

### EXCEPTION FROM 100-FEET SETBACK FROM VULNERABLE FEATURES FOR INFRASTRUCTURE

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It is recommended that the construction of sewer and water lines that are connected to either a centralized wastewater or water system or the City of Laramie's Wastewater or Water system, be allowed within the APO in order to protect water quality. Sewer lines should be engineered in such a way as to limit the possibility of an undetected leak; this may include double walled pipes and regular pressure testing or other engineering techniques and leak detection systems that reduce the possibility of undetected leaks. Exceptions may also include other general utilities used specifically to serve local developments such as electric lines, gas lines for heating, cable television, and telephone lines. Roads may also be excepted if appropriate stormwater drainage and management is included.

### CITY OF LARAMIE UNIFIED DEVELOPMENT CODE

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It is recommended that the amended Aquifer Protection Overlay Zoning Ordinance and CAPP be incorporated into the City of Laramie's Unified Development Code. Incorporating the CAPP and amended ordinance into the Unified Development Code will result in consistency within the City and a single source of information for developers within the City.

### GROUNDWATER MONITORING

Currently, the City of Laramie monitors all municipal production wells on an annual basis for major microorganisms, disinfectants, disinfection byproducts, inorganic chemicals, organic chemicals, and radionuclides as required by EPA. Water-quality results are compared to historical levels. If the results show that concentrations have increased over historical levels, the water is immediately re-sampled. If the second sample again shows higher concentrations, more detailed sampling is undertaken and a study is initiated to identify the source of contamination. Water levels are measured continuously at all of the municipal production wells and at Spur monitoring





wells #7, #8, #10, #11, and #12.

To date, there has not been a systematic, aquifer-wide, long-term groundwater monitoring program to assess water quality in the Casper Aquifer. All of the potential contaminant sources outlined in Chapter 4 may have measurable impacts on water quality but there is not enough data available to assess water quality trends. Groundwater monitoring should be used to establish baseline water quality and to understand the impacts from existing and future development on the Casper Aquifer.

One major concern is the septic systems associated with several subdivisions in Albany County. Wastewater effluent, specifically nitrates and bacteria, from these subdivisions may have measurable impacts to the community's groundwater supply.

While septic systems are a concern, all potential contaminant sources should be monitored through the systematic and long-term study of water quality in the Casper Aquifer. The groundwater monitoring network can assess the water quality and quantity near potential contaminant sources. For example, long-term monitoring wells should be established near mining operations so that the impacts of mining are fully understood.

## **GROUNDWATER MONITORING RECOMMENDATIONS**

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### **GROUNDWATER MONITORING PROGRAM**

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It is recommended that the City and County develop a program to routinely collect groundwater samples and water levels throughout the CAPA to establish baseline water quality data and to evaluate changes in groundwater quality over time. The baseline data collected from this program should be used to set standards for quantifying contamination in the Casper Aquifer. A systematic monitoring program has a secondary benefit of increasing understanding of the Casper Aquifer. The City of Laramie should continue to evaluate water-quality at the City wells in the current manner of comparing current results to historical concentrations and initiating additional sampling when results show increased concentrations.

A good monitoring program can provide an 'early warning' to the arrival of contaminated groundwater at a municipal supply well. The monitoring wells should be located throughout Zones 2 and 3 such that detection would provide enough lead time to either mitigate the in-coming contamination before it can reach a municipal well or to arrange for an alternate drinking water supply or treatment.

The groundwater-monitoring program should include periodic monitoring of groundwater for suspected or known contaminants (e.g., nitrates from septic systems or petroleum products from vehicles on I-80). Monitoring should include a program for voluntary testing of residential wells and creation of permanent monitoring wells within Zones 2 and 3. Incentive plans for residents who allow testing of their well might evoke more interest in such a program.

#### DESIGN A PLAN FOR GROUNDWATER MONITORING PROGRAM

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It is recommended the City design a plan for a long-term groundwater monitoring network and sampling program. Initiating a long-term, aquifer-wide groundwater monitoring program is the highest priority. It is recommended that funding be acquired or set aside as quickly as possible to establish a monitoring program immediately. Appendix F includes a description of the recommended groundwater monitoring program.

### GENERAL EDUCATION AND PLAN IMPLEMENTATION

One of the most effective ways to manage the CAPA is through education of the public, both private citizens and businesses. The CAPP is a first step in protecting the Casper Aquifer but in order to be effective, the CAPP MUST be implemented. A City/County staff person is needed whose primary responsibility is to implement the CAPP.

#### GENERAL EDUCATION RECOMMENDATIONS

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It is recommended that a joint City/County staff be assigned to implement the CAPP. This person should be responsible for implementing the CAPP and serve as a liaison between the City and County. The assigned City/County staff should report their activities annually to the Laramie Community Development Department and Albany County Planning Department. In addition, EAC (Environmental Advisory Committee) should continue to provide guidance, advice, and support to assigned City/County staff as well as receive an annual progress report.

The assigned City/County staff would be the public contact for information regarding the CAPP and CAPA. The staff would be responsible for providing public education to both adults and children including such topics as water conservation and protection, disposal of hazardous wastes, BMPs, and general groundwater education. The groundwater monitoring program should be used to educate the public about water quality and water levels in the Casper Aquifer.

Particularly, the residents living in the CAPA may benefit from sampling residential wells and understanding their ability to protect their own drinking water. The City/County staff would ensure that recommendations in the CAPP are implemented.

### BEST MANAGEMENT PRACTICES (BMPs)

BMPs are designed to minimize groundwater contamination by reducing the possibility of introducing contaminants into the Casper Aquifer. Appendix H includes BMPs for residential land use.

#### BMPs RECOMMENDATIONS

The BMP list should be continuously updated and provided to residents and developers in the CAPA. It is recommended that the County Planning Department and Laramie Community Development Department have additional and more detailed BMP guidelines available for the public to review and for developers to incorporate into their design.

### HOUSEHOLD HAZARDOUS WASTES

Currently the City of Laramie and Albany County work together to provide recycling and disposal services for household hazardous wastes. In the past, volunteer organizations have hosted bi-annual collections but found it difficult to consistently operate. Therefore, the Solid Waste Division (SWD) is taking over this task and will host collection days in the spring and fall. The SWD maintains information on disposal and recycling on their website and through their office.

#### HOUSEHOLD HAZARDOUS WASTE RECOMMENDATIONS

The City and County should continue to work together and provide recycling and disposal of household hazardous wastes through the SWD. These collection days should be advertised in the Laramie Boomerang, on the City and County websites, and through general education opportunities. The SWD should pursue funding to allow them to recycle pesticides and herbicides in addition to paints and batteries.

### SPECIFIC CONTAMINANT SOURCE MANAGEMENT

#### ON-SITE WASTEWATER TREATMENT SYSTEMS/SEPTIC SYSTEMS

According to the EPA Decentralized Systems Technology Fact Sheets (EPA 932-F-99-075, September 1999 and EPA 832-F-00-044, September 2000) a typical septic tank system consists of a septic tank and a below-ground absorption field (also called a drainfield or leachfield). The septic tank is an underground, watertight vessel installed to receive wastewater from the home. It is designed

to allow the solids to settle out and separate from the liquid, to allow for limited digestion of organic matter, and to store the solids while the clarified liquid is passed on for further treatment and disposal. Effluent flows out of the septic tank and is distributed into the soil through the leachfield. The soil below the leachfield provides final treatment and disposal of the septic tank



effluent. After the effluent has passed into the soil, most of it percolates downward and outward, eventually entering the shallow groundwater. A small portion of the effluent is used by plants or evaporates from the soil. Although the septic tank removes some pollutants from wastewater, further treatment is required after the effluent leaves the tank. Nitrogen compounds, suspended solids, organic and inorganic materials, and bacteria and viruses must be reduced before the effluent is considered purified. These pollutants are reduced or completely removed from the wastewater by the soil into which the wastewater drains if the system is designed and installed correctly, and maintained by the homeowner. Failure of systems to adequately treat wastewater may be related to inadequate siting, inappropriate installation, or poor operation and

maintenance.

The majority of the CAPA is outside of Laramie City limits, so currently all rural homeowners within the CAPA use an on-site small wastewater system. Management of septic systems is a high priority because 1) subdivisions within Zones 2 and 3 have systems that are over 30 years old which is the average lifespan of a septic system, 2) new subdivisions are located up gradient from Laramie's wellfields, and 3) residential wells are susceptible to contamination from septic systems due to proximity. Elevated nitrate values (4 - 10.6 mg/l) from drinking water samples within Zone 2 were detected during a Septic System and Water Quality Workshop offered to rural homeowners in January 2001. The U.S. EPA maximum contaminant level is 10 mg/l. In the spring of 2000 the EAC completed a nitrate loading analysis for a high-density subdivision, located within Zone 2 just east of the City limits. This analysis, which followed a methodology promulgated by WDEQ, predicted elevated nitrate levels down gradient from the subdivision (Appendix K).

Albany County is working under a delegation agreement with the WDEQ to regulate small wastewater systems within the County (Appendix L). The County

established a permitting process for septic systems and issued the specifications, Albany County Design and Construction Standards for Small Wastewater Facilities. As part of the permitting process, the septic system design and site plan are submitted for review by the County Planning office or designee. Permitted septic systems in Albany County are then added to a GIS database denoting their location and associated permits. The GIS database will be used as a comprehensive planning tool.

### **ON-SITE WASTEWATER TREATMENT SYSTEMS/SEPTIC SYSTEM RECOMMENDATIONS**

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#### **EAST LARAMIE/ALBANY COUNTY WASTEWATER FEASIBILITY STUDY AND PLAN**

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The City of Laramie and Albany County will work cooperatively to develop an East Laramie/Albany Wastewater Feasibility Study in an effort to assess groundwater quality impacts from residential septic systems. This study will:

1. evaluate the Casper Aquifer water quality within and downgradient of subdivisions within the CAPA (at a minimum this will include a survey of nitrate concentrations);
2. evaluate the costs and risks associated with residential septic systems and alternative wastewater disposal systems;
3. determine if and where alternatives to on-site wastewater disposal is needed;
4. examine alternatives (such as advanced septic systems, centralized septic systems, and sewer) to on-site wastewater disposal systems and feasibility for the CAPA; and
5. evaluate both fiscal and engineering aspects of the alternatives for areas within the CAPA that need waste disposal systems other than septic systems.

The feasibility study will be the first step in determining the impacts of residential septic systems and therefore should begin immediately (2008). Due to the intense interest this recommendation has garnered and statements by several homeowners, it is expected that homeowners in the CAPA will be willing to participate in the sampling that will be required for this study.

#### **SEWER**

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Due to a high level of concern regarding water-quality impacts from septic systems, the City and County should

immediately begin the East Laramie/Albany County Wastewater Feasibility Study (see East Laramie/Albany County Wastewater Feasibility Study and Plan section for further details).

All future subdivisions within the County that have housing densities greater than 10 acres should be required to connect to the City's sewer system or provide a centralized wastewater disposal treatment facility. The cost for increases in sewer capacity due to future development may be assessed to the developer. The City should update its Sewer Master Plan to address increasing sewer capacity east of Laramie as needed. The City and County should work together to determine incentives, grants, and other financial opportunities for areas where on-site septic systems are either prohibited in the future or areas where the Feasibility Study finds that existing systems need to be replaced with alternative systems.

Underground Injection Control (UIC) Class V subclasses 5E3, 5E4, and 5E5 are permitted in the CAPA to allow areas that cannot be served by City sewer an alternative. UICs are permitted by WDEQ and the City of Laramie and Albany County should request WDEQ to notify them through the public notice process of all proposed UICs. Through the public notice, the City of Laramie and Albany County should request that the Casper Aquifer be considered when permitting and establishing requirements for the UIC facility. WDEQ can attach monitoring and operational requirements when permitting UIC facilities.

#### INSPECTIONS

It is recommended that the County Planning Office maintain authority to inspect new and replaced septic systems and leach fields, prior to backfilling, to verify proper installation and confirm design information stated in the permit application and at least once every three years.

#### PUMPING

The septic systems should be pumped out at least every five years or on a schedule that is recommended by a licensed wastewater hauler/pumper.

## EDUCATION

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Approximately 400 conventional septic systems exist within the CAPA (Figure 4-2a). Education is recommended to promote proper maintenance of septic systems in the CAPA. A homeowner's guide to septic systems is available at the Albany County Planning Office and contains the following information:

- Description of a typical septic system;
- How to care for a septic system; and
- Tips to avoid trouble.

## DESIGN AND LOCATION STANDARDS

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The following design and location standards are recommended for septic systems within the CAPA.

### CERTIFICATION FOR SYSTEMS

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It is recommended that the City and County require, by regulation, installation, design, repair, and removal of septic systems located within the APO zone be in accordance with plans and specifications prepared by and certified by a professional engineer skilled in the science of wastewater disposal and licensed to practice in the State of Wyoming.

### SETBACK FROM VULNERABLE FEATURES

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Features observed in the CAPA have been identified as having the potential to provide routes of contamination to the Casper Aquifer from the ground surface. These vulnerable features are discussed in detail in Chapter 3 and no septic systems should be installed within 100 feet of these vulnerable features.

### EVALUATE SEPTIC SYSTEM RISKS

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It is recommended that a site-specific investigation be conducted as part of designing on-site wastewater treatment systems proposed within Zones 2 and 3, or whenever any septic system is being repaired, replaced, or installed within Zone 2 or 3. The site-specific investigation should be performed by a Wyoming registered engineer and/or Wyoming licensed geologist qualified to

perform the investigation and should address the requirements identified in Chapter 3.

If the site-specific investigation determines that leachate from the on-site wastewater treatment system may infiltrate through faults, fractures, or dissolution features and into the Casper Aquifer, it is recommended that the septic system be deemed inappropriate for the subject site and either the development must connect to a centralized system or be moved to an appropriate site.

#### STUDY OF RESIDENTIAL IMPACTS ON WATER QUALITY

In conjunction with the long-term groundwater monitoring program, a study should be conducted regarding the impacts of residential development on the Casper Aquifer (see Appendix F for additional details). Land use surrounding the monitoring wells should be analyzed and contaminant levels within these wells should be viewed in light of existing land use. Landowners should be contacted to determine landscaping practices, chemical use, water use, and septic system maintenance in the vicinity of the monitoring well. The land use impact study should also determine the density of residential development that the CAPA can sustain without negatively impacting the Casper Aquifer.

#### **INTERSTATE 80 (I-80)**

Transport of hazardous materials along I-80 has been categorized as a threat with a high likelihood and greatest potential severity of damage to the Casper Aquifer (see Table 6-1). I-80, from milepost 323 to 317, cuts through the Casper Aquifer exposing the aquifer to contamination from spills. Figure 5-1 shows the number of crashes on I-80 that involved a semi-tractor and trailer from 1998 to 2006 according to Wyoming Department of Transportation (WYDOT). WYDOT personnel estimated that 25% of the semi-tractor and trailers haul hazardous wastes (Mulcare, personal communication).

In addition to hazardous materials, stormwater run-off from I-80 carries oil, grease, metal particles from tires and brake pads, and other automotive fluids and particles from the road over the recharge area. The stormwater may then infiltrate into the Casper Aquifer along with any associated contaminants.



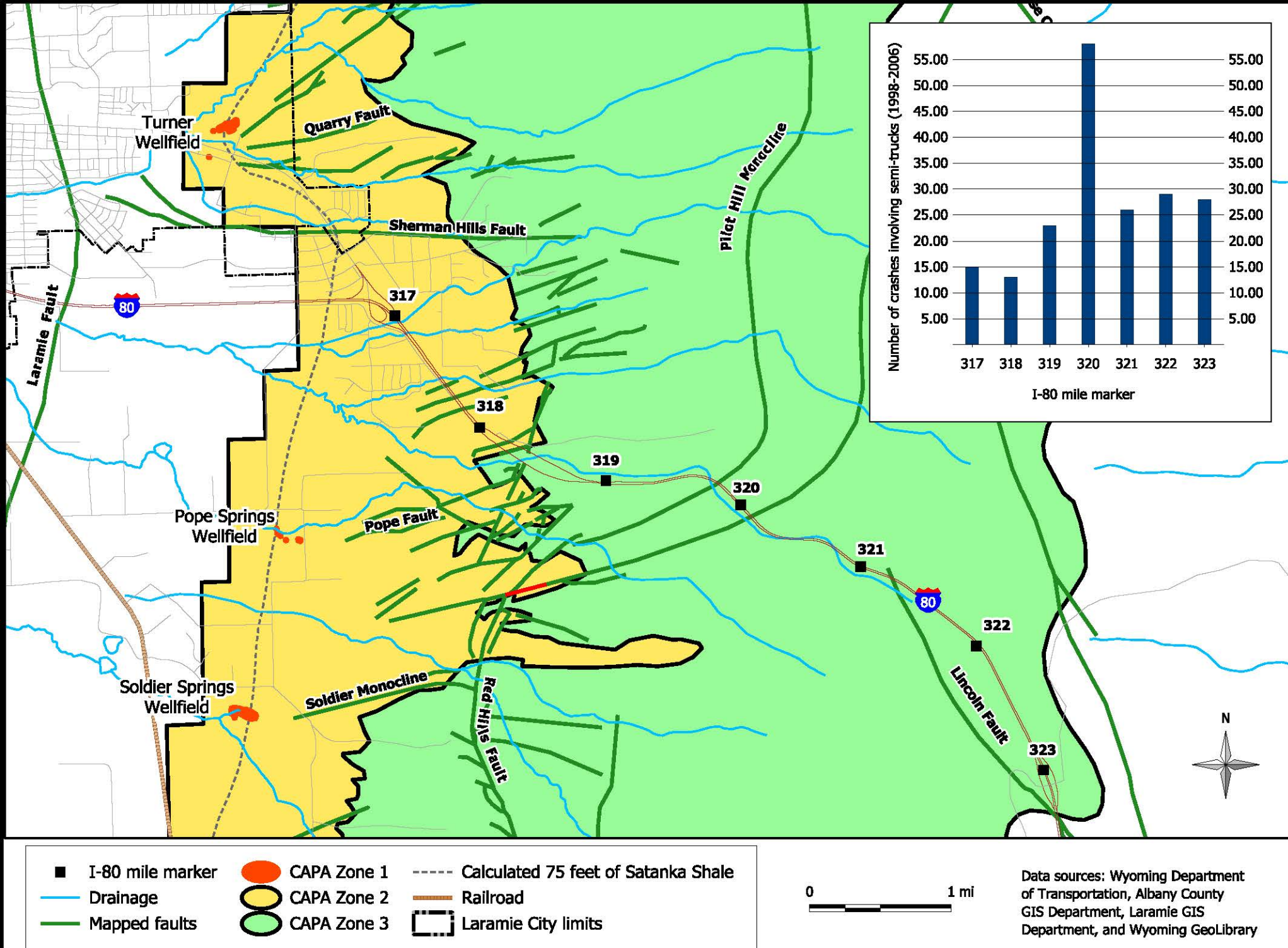


Figure 5-1. Crashes involving semi-trucks and tractors per highway mile from 1998-2006.

## INTERSTATE 80 RECOMMENDATIONS

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### PRE-INCIDENT EMERGENCY RESPONSE STRATEGIES

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Since I-80 is a high likelihood and severe risk to the aquifer, the City/County should take immediate steps to reduce the likelihood and risk of this threat. One effective first step is to prepare for a hazardous material spill. In order to prepare for such an incident, training of emergency response personnel and a test of the emergency response system should be conducted immediately. After the initial training, emergency response training should occur annually. It is recommended that the Emergency Response Coordinator be involved in the CAPP process.

The EPA provides some tabletop training modules via their website and these could be used by local personnel. Additionally, the emergency response personnel may find it helpful to contact WDEQ or EPA Region 8 to assist in training exercises.

### POST-INCIDENT EMERGENCY RESPONSE STRATEGIES

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- The Wyoming Highway Patrol should notify the Laramie Albany County Records and Communications (LARC), which would in turn notify the Laramie Fire Department, Albany County Sheriff's Office, and Public Works Department that a spill has occurred.
- Responding agencies appraise extent and severity of spill and begin initial mitigation efforts.
- Responding agencies notify Albany County Emergency Coordinator who may initiate use of the CAPP Contingency Plan.
- Public Works Department will begin testing the monitoring wells along the I-80 corridor.
- WDEQ will be notified and requested to provide additional spill mitigation assistance, as needed.

### MITIGATION MEASURES STUDY

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To protect the Casper Aquifer from contamination, it is recommended that an investigation be funded to consider mitigation alternatives (Appendix F). Conceptual designs and cost estimates for alternative mitigation designs would be generated during the study.



Because of the risks posed by I-80 as a potential contaminant source, and the complex design considerations, it is further recommended that the City and County acquire the professional services necessary to complete this task. The selected consultant must have demonstrated experience in the design and construction of environmental mitigation projects, expertise in the hydraulics and hydrology of stormwater management, and a familiarity with the local hydrogeology. WYDOT should be involved as a partner throughout the design and construction of the project.

#### RETENTION POND

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One potential mitigation alternative is the construction of a lined retention pond. The retention pond may allow spilled liquids to be retained rather than infiltrating into the Casper Aquifer. The pond would be located east of the epsilon and delta members that are the primary production zones for the City's municipal wells.

#### RE-ROUTE I-80

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By re-routing I-80, the entire CAPA could be avoided and thus the risk from I-80 eliminated. Working with WYDOT, the City of Laramie should determine if re-routing I-80 is a feasible option.

#### SIGNS

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It is recommended that road signs designating a Water Supply Protection Area be posted along I-80 between milepost 323 to 317. The road signs should comply with the City Water System Vulnerability Abatement Program. The City and County should work together with the WYDOT to install the signs, which would be designed to alert the public to report spills by calling 911.

#### CLEANING I-80

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The City of Laramie and Albany County should work with WYDOT to ensure regular street sweeping of I-80. WYDOT should properly dispose of all materials in a landfill or other appropriate disposal facility.

#### MOA/MOU

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The City of Laramie and Albany County should enter into an MOA/MOU with WYDOT immediately. The MOA/MOU could be used to provide support from WYDOT for the I-80

mitigation study, help with sign placement, and ensure regular I-80 cleaning.

## ROAD SALT APPLICATION

Road salt (NaCl) may enter the groundwater after deicing materials are used on I-80 and other transportation corridors in the CAPA. g However, because numerous hazardous materials are transported along I-80 and these materials pose a greater risk to the Casper Aquifer than high salinity, there must be a balance between safety for drivers and the increased risks of accidents compared to the water-quality risk from road salts.

### ROAD SALT APPLICATION RECOMMENDATIONS

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#### MONITORING

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Sample for chlorides or measure conductivity at monitoring wells along I-80. Due to the high volume of traffic along this corridor it is not feasible to eliminate deicing materials, therefore, monitoring is the best management strategy.

## SPRINGS

Springs have been identified throughout the CAPA that provide a direct pathway from the ground surface to the Casper Aquifer. Most prominent are the historic springs located adjacent to the City's water supply wells. The historic springs, made up of City Springs, Pope Springs, and Soldier Springs, do not flow because the municipal wells reverse the groundwater flow direction. This makes the historic springs a direct conduit to groundwater and the City of Laramie's drinking water.

Other ephemeral springs have been identified in upland areas. Ephemeral springs when not flowing, also are a direct conduit to the Casper Aquifer. A spring in Telephone Canyon along I-80 is especially significant because it presents a direct pathway to the Casper Aquifer from hazardous material spills on I-80.

All springs, flowing or not, put the aquifer at some degree of risk because springs, by definition are where the aquifer meets the land surface. Springs are groundwater discharge points; the flow of water is up and out. Because springs discharge water there is hydraulic protection from light non-aqueous phase liquids (LNAPL). LNAPLs are liquids that are sparingly soluble in water and less dense than water. For example, oil is an LNAPL because it "floats" on top of water and does not mix with water. However if a dense non-aqueous phase liquid (DNAPL) were introduced at a spring the DNAPL may contaminate the Casper Aquifer. DNAPLs are liquids that are denser than water and do not dissolve or mix easily in water. Many chlorinated solvents, such as trichloroethylene, are DNAPLs. Because the DNAPL is denser than water, it may enter the aquifer and be transmitted along the same pathways as water.

## SPRINGS RECOMMENDATIONS

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### EDUCATION

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Public education will increase awareness of how springs may provide a potential pathway for migration of contaminants from a surface source to the Casper Aquifer. Springs located in undeveloped upland areas, away from contaminant sources, present less of a threat. Through education, the City and County should work to ensure that land use practices in the vicinity of springs are protective of the aquifer.

### MITIGATION MEASURE

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The mitigation measures study recommended for the I-80 corridor should address mitigation strategies for potential contamination of the spring in Telephone Canyon.

### LAND PURCHASES AND REGULATIONS

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The historic springs adjacent to the City's municipal supply wells fall within the Zone 1 delineation. We recommend the City purchase land within Zone 1 and prohibit all uses except open space within Zone 1. Whenever possible, the City should also purchase land adjacent to Zone 1 at the Turner, Pope, and Soldier wellfields.



## WELLS

A well completed in the Casper Aquifer provides a direct conduit for the introduction of contaminants into the aquifer. Wells, whether for the public water supply, stock watering, irrigation or domestic use, must comply with the well construction standards from the Wyoming State Engineer's Office (SEO) or the WDEQ. The SEO provides well design requirements in their Regulations and Instructions, Part III, Water Well Minimum Construction Standards. The WDEQ does not regulate the construction of domestic wells, but Chapter 11, Part G, and Chapter 12, Section 9 of Wyoming Water Quality Rules and Regulations apply to the construction of monitoring wells and public drinking water supply wells, respectively.

## WELLS RECOMMENDATIONS

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### EDUCATION

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Education will increase awareness of how private wells may be a pathway for contaminants. Of particular importance is that wells should be properly capped (i.e., locked or bolted closed) to prevent unauthorized direct access to the interior of the well. Information in the form of a brochure should be prepared to inform residents of the importance of properly



capping, constructing, and abandoning wells. The County and City should use similar techniques to educate the owners of the existing wells in the area about proper well maintenance and require proper well abandonment.

Through education, the City and County should work to ensure that all non-municipal water wells constructed in the CAPA are capped and cased with a surface seal.

#### WELL DESIGN

It is recommended the City and County adopt the amended APO ordinance. The ordinance prohibits wells that are not properly capped and not cased at least to the top of the production zone with the annular space sealed from the top of the production zone to the surface. The cement grout seal prevents the vertical migration of chemical, biological, or radiological contaminants via the well and annulus. Annular seals will also reduce the waste of groundwater by leakage and prevent the mixing of groundwater between aquifers.

### **ABANDONED WELLS**

Proper abandonment of wells is imperative in protecting the Casper Aquifer. Improperly abandoned wells are particularly hazardous because the well is a direct conduit that leads directly from the ground surface into the groundwater. The locations of improperly abandoned wells are often unknown making accidental introduction of contaminants more likely.

#### ABANDONED WELLS RECOMMENDATIONS

##### ORDINANCE

The amended County APO Resolution and City APO Ordinance requires landowners to properly plug and abandon wells in accordance with Chapter 11, Section 70, Part G of the Wyoming Department of Environmental Quality Rules and Regulations.

##### PUBLIC EDUCATION

The assigned City/County staff should contact owners of improperly abandoned wells. The landowner should first be advised of the hazards posed by an improperly abandoned well and instructed on the proper methods of plugging a well. The WDEQ and the SEO should also be advised of the presence of an abandoned well for the enforcement of existing regulations.

Information in the form of a brochure should explain that abandoned and improperly constructed wells may serve as a conduit for surface contamination to reach groundwater. The brochure should provide information on how to properly plug and abandon a well.

## UNDERGROUND INJECTION CONTROL (UIC) WELLS

Classes I, II, III, and IV UIC wells as defined in WDEQ Chapter 13, and most Class V UIC wells as defined in WDEQ Chapter 16 would cause groundwater or aquifer degradation due to their inherent use. However, some types of UIC wells are beneficial. WDEQ Chapter 16 lists beneficial uses as Class V subclasses 5B2, 5B3, 5B4, 5B5, 5B6, and 5B7. Beneficial uses include but are not limited to remediating groundwater, replenishing groundwater in an aquifer, or confining contaminants inside the aquifer. Class V 5E3, 5E4, and 5E5 UICs are types of wastewater disposal systems which are permitted by WDEQ, are appropriate alternatives to septic systems, and may help protect groundwater quality. Class V 5A1 (e.g., direct heat reinjection facilities) and 5A2 (e.g., heat pump/air conditioner return flow facilities) are also wells that may be harmless as long as no additives are used when injecting water into the aquifer. Currently there are no UIC wells in the CAPA but because their inherent use could cause groundwater degradation, it is important to prohibit them.

### UIC WELLS RECOMMENDATION

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#### ORDINANCE

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All UIC wells, except Class V subclasses 5B2, 5B3, 5B4, 5B5, 5B6, 5B7, 5E3, 5E4, and 5E5 and Class V subclasses 5A1 and 5A2, if 5A1 and 5A2 facilities do not use any additives, as defined in WDEQ Chapter 16, should be prohibited in the CAPA.

## HAZARDOUS MATERIALS SPILLS ALONG UNION PACIFIC RAILROAD (UPRR)

The UPRR Hermosa spur line crosses a portion of Zone 2 south of Laramie. Thousands of rail and tanker cars carrying hazardous material use this line annually.

### HAZARDOUS MATERIALS SPILLS ALONG UPRR RECOMMENDATIONS

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#### MEMORANDUM OF AGREEMENT OR UNDERSTANDING (MOA/MOU)

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The City and County need to establish a notification protocol with the UPRR Risk Management Communication Center in case of a spill along the Hermosa Line within Zone 2. It is

important that UPRR understand that if a spill occurs in this area, groundwater contamination prevention measures should be taken immediately.

#### EMERGENCY RESPONSE TRAINING

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Communication between UPRR, the City and the County is the most effective means of managing the threat of contamination from derailment. Establishing clear lines of communication prior to an accident will decrease the response time of the City and County. Emergency response drills should be conducted that include a hazardous material spill along the UPRR so that the lines of communication are in place prior to an emergency.

#### SIGNS

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Signs indicating the CAPA and emergency phone numbers should be posted along railroad rights-of-way in the CAPA.

### LIMESTONE QUARRIES

Permitted active limestone quarries exist east of the Turner, Soldier, and Pope wellfields. Most of the quarries are operated by Mountain Cement Company for the production of Portland cement and are regulated by WDEQ.

The quarries remove the overburden (material not suitable for cement) and expose the underlying limestone in areas (<100 acres) within the CAPA. Explosive storage, blasting, large truck traffic, and bulk fuel storage occurs within the CAPA. Some of the quarries are located near faults and the blasting process has the potential to generate contaminants and induce additional fracturing. One of the more substantial threats posed by limestone quarrying occurs in the bulk storage of fuel. However, the refueling areas are lined by an impermeable layer that can contain the entire volume of the largest possible release, include a spill kit, and are “dish shaped” to fully contain a spill. Additionally, the quarry operations are permitted and regulated by the State. The active quarry areas are secured by fencing and gates that restrict access and reduce the potential for intentional contamination. Upon completion, the mined areas are reclaimed using the overburden removed at the beginning of the process and long-term impacts of quarry should be minimal.





## LIMESTONE QUARRIES RECOMMENDATIONS

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### EXISTING REGULATIONS

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Limestone quarries are regulated by Wyoming state law and regulations and the existing regulations should be used to protect the Casper Aquifer. Currently, the regulations include the Wyoming Environmental Quality Act, Title 35, Chapter 11 and WDEQ water quality rules and regulations.

### MONITORING

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The quarry operators should incorporate two of their monitoring wells into the City's long-term monitoring network described at the beginning of this chapter. Monitoring limestone quarries will ensure that the impacts, if any, from quarrying are identified.

### MOA/MOU

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As part of the MOA/MOU, quarry owners in the CAPA should be informed of the sensitivity of the Casper Aquifer to contamination and the importance of BMPs, spill prevention, and rapid clean-up of spills of hazardous materials. The MOA/MOU should establish that the permitted is responsible for mitigating any contamination of the aquifer that results from quarry operations. Quarry operators should provide to the City a spill or accident contingency plan, a notification protocol, and with water-quality data that are collected annually from monitoring wells at the quarries.

### PERMITTING

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The City/County should request that the WDEQ-Land Quality Division review and approve all applications for permits to mine or quarry within the CAPA in light of the CAPP.

## LANDFILLS AND DUMPS

Landfills and dumps may have materials that could contaminate the aquifer. Landfills are permitted waste disposal sites where the wasted material is placed in trenches, compacted, and covered with compacted soil to reduce the ability of water to infiltrate into the buried waste. A properly operated landfill covers the waste every day with compacted soil. The Laramie Landfill is located approximately 2 miles west of the CAPA which is considered to be a safe distance. The general groundwater flow direction is westward and any groundwater beneath the Laramie Landfill will flow away from the CAPA.

Dumps are a broad category of unpermitted waste disposal that may include innocuous items such as broken rock or glass to contaminants such as used oil.

Currently, there are no known dumps in the CAPA. The annual clean-up day appears to be accomplishing the desired effect of eliminating illegal dumping.

## **LANDFILLS AND DUMPS RECOMMENDATIONS**

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### **CLEAN-UP DAYS**

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The County hosts annual clean-up days which allows residents to bring items to the Laramie Landfill or local collection sites for free. It is recommended that these annual clean-up days continue and that large-scale advertisement of this collection event occur to encourage all City and County residents to participate.

### **ORDINANCE**

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The amended County APO Resolution and City APO Ordinance prohibit landfills and dumps within the APO. Upon identification of illegal dump sites, WDEQ should be contacted and asked to investigate the scene. The owners of the dumps should be contacted and informed of their responsibility to rid the community of said nuisance. Landowners should be made responsible to pay for cleanup

## **LARAMIE RIFLE RANGE**

The Laramie Rifle Range Corporation (LRRRC) operates a shooting sports facility within the CAPA on approximately 320 acres located in Sections 1 and 12, Township 16 North, Range 73 West. The establishment of the facility predates adoption of the CAPP by the City and County.

The operation of the LRRRC facility is important to the residents of Laramie and Albany County. This facility serves the residents in the County who are interested in shooting sports and serves to protect the welfare and safety of the general public by providing a safe location for the discharge of firearms. In 1998, the City developed the Spur Wellfield which is located approximately 1 mile northwest of the LRRRC facility. The area surrounding the facility is also experiencing increased rural residential development that obtains drinking water from the Casper Aquifer.

The primary concern regarding the LRRRC is the use of lead bullets and the possible leaching of lead from the bullets into groundwater. Lead adheres to iron minerals, organic matter, and clay materials. Generally, lead does not leach into groundwater due to its tendency to adsorb onto solid materials, and consequently, lead contamination is contained to the top six inches of soil (Lin et al, 1995; Voigt, 2007).

## LARAMIE RIFLE RANGE RECOMMENDATIONS

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### MONITORING AND INVESTIGATION

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The risk of contamination to Albany County residents and Laramie's water supply as a result of activities at the LRRC is unknown but based upon mobility studies the risk should be low. However, the area should be included in the groundwater monitoring program to determine if any lead is leaching into the groundwater. The soils around the shooting areas should also be tested to determine the depth of lead contamination, if any.

If the monitoring indicates that lead has leached into the groundwater and/or is present in large quantities in the soil, further investigations should be initiated. The study should include more detailed sampling of the soils and groundwater. The investigation should further provide recommendations for monitoring, mitigation strategies (e.g., BMPs, design and operation standards, etc.) and ultimately, remediation of the site, if it is determined that operation of the facility poses a significant threat to the Casper Aquifer.

### COMMUNICATION

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The City and/or County officials should initiate a meeting with the LRCC. The purpose of the meeting is to:

- Inform the LRCC of the CAPP.
- Discuss the need for groundwater monitoring.
- Discuss funding for an initial independent investigation of the facility for both groundwater and soil contamination. If this study finds contamination, further investigations would be warranted
- Discuss a timeline for completion of the initial investigation.
- Establish the LRRC's ultimate responsibility for monitoring, mitigating, and if need be, remediation of the site.

### MOA/MOU

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Based on discussions with the LRRC described above, a formal agreement should be drafted specifying the responsibilities of the LRRC for protecting the aquifer. If agreement with the LRRC cannot be reached, the measures described herein and above should be accomplished by regulation.

## SEWER LINES

While sewer lines are preferable to septic systems in the CAPA, sewer lines may leak or break. However, through design and inspections, the likelihood of groundwater contamination can be reduced.

### SEWER LINES RECOMMENDATIONS

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#### DESIGN

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As sewer lines are extended out to other areas of the CAPA or as existing lines are replaced, the sewer lines should be engineered in such a way as to limit the possibility of an undetected leak. Engineering techniques may include double walled pipes and regular pressure testing or other engineering techniques and leak detection systems that reduce the possibility of undetected leaks. The best technologies and engineering should be used to provide the highest level of protection.

#### INSPECTIONS

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The City should ensure that the sewer lines that serve all subdivisions, starting with the Imperial Heights Subdivision, do not leak especially where the sewer line is buried beneath Grand Avenue and crosses the Quarry Fault (e.g., by using a pipeline video camera). A break in the sewer line near the Quarry Fault could have serious impacts on water quality at the Turner Wellfield. As other subdivisions in the APO are placed on centralized wastewater systems, inspections should occur in these subdivisions as well. If portions of the APO are served by utilities other than the City, part of the utility's responsibility should include inspections.

## URBAN RUNOFF

Paved parking lots in the CAPA may contribute contaminated runoff that infiltrates into the Casper Aquifer. Rainwater collects oil and grease from paved surfaces, motor vehicles, metal particles from tires and brake pads, and may carry these pollutants across the recharge area or into storm drains, that eventually flow to the Laramie River. If allowed to infiltrate, stormwater also provides a source of recharge to the Casper Aquifer.

### URBAN RUNOFF RECOMMENDATIONS

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#### DESIGN STANDARDS

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Even though the City of Laramie currently does not come under any federal stormwater management requirements, it is recommended that stormwater management and

engineering become a part of development standards in the CAPA. The County and City Engineering departments should provide design standards and recommendations for use within the CAPA that reduces the pollution load and, if possible, provide recharge benefits.

#### INTERJURISDICTIONAL COMMUNICATION

The City and County Planning commissions should be made aware of the importance of permitting future parking lots and streets located in the CAPA. Additionally, the Engineering departments should base their design standards and recommendations on the latest research in regards to stormwater management in arid aquifer protection zones.

### **UNDERGROUND STORAGE TANKS (UST)**

USTs pose a high risk to groundwater due to the nature of materials stored within these vessels and the inability to readily see leaks except through secondary detection methods. Due to the high risk posed, USTs should remain prohibited in the CAPA.

#### UST RECOMMENDATIONS

##### EXISTING REGULATIONS

The existing County APO Resolution and City APO Ordinance prohibit installation of all new underground storage tanks within the CAPA. This prohibition should not apply to the repair, maintenance, or replacement of existing USTs if secondary containment is added. The prohibition of UTSs is carried over to the amended County APO Resolution and City APO Ordinance.

### **ABOVEGROUND STORAGE TANKS (AST)**

ASTs are generally used to store fuel and leaks from tanks storing hazardous materials may pose a threat to drinking water.

#### AST RECOMMENDATIONS

##### DESIGN AND LOCATION STANDARDS

ASTs should be designed and operated according to the State of Wyoming's standards (Chapter 17, Water Quality Rules and Regulations).

##### EDUCATION

Owners of ASTs should be given information on best management practices of ASTs to ensure proper installation and monitoring procedures.

## ORDINANCE

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It is recommended that the amended ordinance prohibit ASTs unless the following conditions are met.

1. Store hazardous material in an enclosed structure or under a roof which eliminates stormwater entry to the containment area.
2. Provide floors within a structure where hazardous material is stored, coated to protect the surface of the floor from deterioration due to spillage of any such material. A structure which may be used for storage or transfer of hazardous material shall be protected from stormwater run-on and ground water intrusion.
3. Store hazardous material within an enclosed impermeable containment area which is capable of containing at least the volume of the largest container of such hazardous material present in the area or 110% of the total volume of all such containers in the area, whichever is larger, without overflow of released hazardous material from the containment area.
4. Store hazardous material in a manner that will prevent the contact of chemicals with any materials so as to create a hazard of fire, explosion or generation of toxic substances.
5. Store hazardous materials only in containers that have been certified by a state or federal agency or the American Society of Testing Materials as suitable for the transport or storage of the material.
6. Store all hazardous material in an area secured against entry by the public, except items offered for retail sale in their original unopened containers.
7. Not use, maintain or install floor drains, dry wells or other infiltration devices or appurtenances which allow the release of wastewater to the ground water.
8. Not discharge any substance or material to the ground in the APO zone unless the discharge is permitted by law.

## PESTICIDE AND FERTILIZER APPLICATION

Businesses and residents within the CAPA apply pesticides and fertilizers to landscaped areas. These chemicals have the potential to leach into the groundwater, especially if applied improperly.

The City Parks and Recreation Division, Mosquito Control Program conducts aerial applications of *bacillus thuringiensis israelensis* (Bti) each May. Bti is a bacterial-based mosquito control product that is harmless to humans, other mammals, birds, and fish. The City's larval control program applies Bti to wet areas and wetlands that are known to be mosquito breeding habitats. The City's mosquito control program also includes aerial application of ultra low concentrations of malathion in June. The aerial applications of Bti and malathion occasionally occur within the CAPA.



## PESTICIDE AND FERTILIZER APPLICATION RECOMMENDATIONS

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### LANDSCAPING REQUIREMENTS

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New developments within the CAPA are recommended to landscape using native plants, BMPs, low maintenance and low water vegetation, and xeriscape concepts. Native vegetation will reduce the amount of pesticides, herbicides, and fertilizers that need to be applied. The City and County Planning commissions should be aware of the benefits and encourage the use of native and xeriscape landscaping.

### EDUCATION

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Residents and businesses within the CAPA should be educated regarding the use of native plants to reduce the need for watering and chemical use. Additionally, landscaping businesses should be educated and encouraged to provide native landscaping services. The local government entities should lead by example and initiate native landscaping throughout their facilities and open space.

All individuals, organizations, and government departments using fertilizers, herbicides, pesticides, or insecticides are required by federal law to apply it according to the manufacturers' specifications. Brochures should be developed to promote the reduced applications, organic alternatives, and, if used, proper application of pesticides, insecticides, herbicides and fertilizers.

## AGRICULTURE

Agriculture, particularly livestock grazing, is the dominant land use within the CAPA. Agriculture zoning is the least intensive land use within Albany County. Livestock grazing is a source of potential contamination because the waste produced by the animals may enter the groundwater. Where there are uncapped wells or thin soils, there is a greater potential for wastes to enter the Casper Aquifer. High concentrations of animals also increase the risk of contamination. Particularly, commercial feedlots and confined animal feeding operations may have large amounts of waste which can enter the groundwater system and contribute to nitrate and bacterial contamination.

### AGRICULTURE RECOMMENDATIONS

#### ORDINANCE

It is recommended that the amended County APO Resolution and City APO Ordinance include the following provisions.

1. Prohibit commercial animal feeding operations where
  - a. animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and
  - b. crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.
2. Prohibit all livestock and irrigation wells that are not capped.
3. Prohibit all livestock and irrigation wells that are not cased at least to the top of the production zone with the annular space sealed from the top of the production zone to the surface.

## MEDICAL WASTES

There are several businesses in Zone 2 which produce medical wastes. The contamination from medical wastes was deemed a low threat in the potential contaminant inventory.

### MEDICAL WASTE RECOMMENDATIONS

#### EXISTING REGULATIONS

Existing regulations should be used to manage medical waste sources. The disposal and handling of medical wastes in



Wyoming is regulated by the Occupational Health and Safety Administration of the Department of Employment.

## EXISTING NONCONFORMING USE

Nonconforming uses are uses which are prohibited by current regulations but were in place before the regulation took effect. There are some businesses along the east end of Grand Avenue that may be nonconforming.

### EXISTING NONCONFORMING USE RECOMMENDATIONS

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#### EXISTING REGULATIONS

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The City and County should use existing regulations, such as State UST regulations and the amended ordinance, to manage nonconforming uses within the CAPA.

#### EDUCATION

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The City and County should continue to educate all business owners about the importance of pollution prevention practices, BMPs, and to inform them about the CAPA and CAPP.

## LAND ACQUISITION

Land acquisition may be used as a management strategy to protect the most sensitive areas of the CAPA. Land acquisition, as stated previously, includes: purchasing, donations, conservation easements, land exchanges, transfer of development rights, and MOA/MOU.

### LAND ACQUISITION RECOMMENDATIONS

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#### PURCHASING

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It is recommended that the City of Laramie, purchase all land within Zone 1 of the CAPA. The City should also consider purchasing land in Zone 2 that is adjacent to Zone 1 at the Turner, Pope, and Soldier wellfields. Purchasing land in these areas will ensure protection of the most critical areas within the CAPA. Once purchase is accomplished, annexation of these areas should be a high priority.

#### CONSERVATION EASEMENTS AND OTHER LAND ACQUISITION MECHANISMS

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It is recommended that the City and County work towards a conservation easement program that will allow landowners to set aside a portion of their land that protects the land from development. Donation of land is another mechanism for the City and County to protect sensitive areas from development. Transferring development rights and land exchanges would

also allow the City and County developmental control over specific land areas and should also be pursued as the City and County continue to protect the Casper Aquifer.

#### WORK WITH LANDOWNERS

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The City government should work with CAPA landowners to shift development rights, change density requirements in specific areas, purchase land, and/or obtain conservation easements. While it is highly unlikely that all of the CAPA will come under public ownership, the landowners within the CAPA have natural incentives to protect the groundwater in order to protect their investment. These landowners should be viewed as valuable resources in protecting groundwater.

## RECOMMENDED MANAGEMENT STRATEGIES AND IMPLEMENTATION SCHEDULE

Implementation of management strategies is the responsibility of the Laramie City Council and Albany County Board of Commissioners. This section prioritizes recommendations for managing potential contaminant sources with an implementation schedule.

As of January 2008, the Laramie City Council and Albany County Board of Commissioners have implemented the following items:

1. Established an overlay zoning district.
2. Established a systematic groundwater monitoring program for the Casper Aquifer at the City of Laramie production wells.
3. Created a permanent staff position to develop and oversee an on-site wastewater management program within the CAPA, including:
  - a. Consistently and thoroughly inspect new on-site wastewater treatment facilities, and
  - b. Inspections of on-site wastewater treatment facilities upon property transfers.
4. Established requirements for two compartment septic tanks for new or replacement construction of on-site wastewater treatment systems.
5. Collected household hazardous wastes on a semi-annual basis.

### YEAR 2008 MANAGEMENT GOALS (IMMEDIATE IMPLEMENTATION)

The following management programs and policies should be implemented immediately:

1. The City and County should pass the amended ordinance and resolution, respectively, as provided in Appendix I.
2. Begin East Laramie/Albany County Wastewater Feasibility Study.
3. Design and implement an expanded groundwater monitoring program.
4. Pursue WYDOT MOA/MOU, obtain funding, and begin I-80 mitigation study.
5. Assign a joint City/County staff person to implement the CAPP by June 2008.
6. Retain a consultant or qualified staff to review site-specific investigations and development plans within the CAPA.

### YEAR 2009 MANAGEMENT GOALS (WITHIN 1 YEARS)

1. Begin inspecting existing septic systems through the Water and Wastewater Engineer staff position and repeat inspections every three years.
2. Conduct a table-top emergency response drill using a hazardous material spill on I-80 as the scenario. In 2009, a full-scale exercise using a similar scenario should be conducted.
3. Purchase Zone 1 property.

### YEAR 2010 MANAGEMENT GOALS (WITHIN 2 YEARS)

The following management programs and policies should be implemented no later than 2010. Note that the time frame for these programs is based not on lesser importance, but by the logistical constraint:

1. Investigate impacts of residential development on water quality.
2. Pursue funding and initiate a study of I-80 mitigation measures.
3. Implement all educational goals described in this chapter.
  - a. General education program for aquifer protection.
  - b. Septic system maintenance.
  - c. The potential for wells and springs to provide a direct route for the introduction of contaminants into the aquifer.
  - d. Proper well construction, capping, plugging, and abandonment.
  - e. Best Management Practices for potential contaminant sources.

- f. Proper pesticide and fertilizer application and ways to decrease the need for these chemicals to residents, businesses, and local governments.
- 4. Post signs along I-80 and UPRR to indicate CAPA and provide phone numbers for emergencies.
- 5. Establish Memoranda of Understanding or other agreements with the UPRR and quarry owners.
- 6. Conduct annual emergency response training for other contamination scenarios such as railroad derailment.
- 7. Contact owners of improperly capped, unused or abandoned wells and require that owner properly cap or abandon the well.
- 8. Inspect sewer lines in the CAPA.
- 9. Establish design standards for stormwater management.
- 10. Adopt landscaping BMPs within the CAPA.
- 11. Consider purchasing Zone 2 land immediately adjacent to Zone 1 at the Turner, Pope, and Soldier wellfields.
- 12. Work with WYDOT to establish a regular cleaning schedule for I-80.
- 13. Become a member of the National Groundwater Foundation.

#### YEAR 2012 MANAGEMENT GOALS (WITHIN 4 YEARS)

- 1. Work with landowners to determine the potential for establishing public land within the CAPA.
- 2. Pursue funding for recycling pesticides and herbicides through the Solid Waste Management District.
- 3. Begin talking with LRRC to implement initial investigation of lead levels in soils. through the Solid Waste Management District.

## NOTE

When evaluating future environmental concerns in Albany County and the City of Laramie, the data used by the EAC, the Albany County Planning and Zoning Commission, Laramie Planning Commission, other government officials, and any hired consultants will not be limited to the contaminant sources, land uses and other information used in the CAPP. Any contaminant sources, future growth, future land use and any other information affecting the CAPP will be considered as changes occur and the CAPP is updated.