

UTILITY SYSTEMS

6

CHAPTER

Land development places added demands on the City to provide residents with services of facilities, including utilities (water, wastewater, and drainage), police and fire protection, emergency medical services, parks and recreation facilities, among others to meet increased demand in service. Satisfying these demands costs money, and requires a significant amount of government resources. When the City reacts to development proposals, it is placed in a position of responding to sporadic and unplanned development. Serving scattered development is much more costly than proactively planning for responsible, compact growth. Utility systems provide the groundwork for almost all development and growth, thus it is important for the City of Laramie to address these issues.

THE GROWTH MANAGEMENT CHALLENGE

A significant growth management challenge is confronting the City of Laramie, because there are large vacant land areas surrounding the City that are considered attractive to development. Nearly all of these undeveloped areas, however, currently lack streets, utilities, water and sewer thus straining existing services by any new development. Additionally, the City is facing investment decisions involving maintenance or replacement of existing, aging infrastructure. Current fiscal resources are being burdened to meet all needs for utility extension, upgrading, maintenance, and operation.

Any further discussion of Urban Growth must be preceded by more detailed enumerations of the current status of utility systems.

UTILITY SYSTEM FACILITIES, SERVICE AREAS AND CONDITIONS

Water Supply, Treatment, Distribution and Storage

The City obtains water from two sources: the Laramie River and the Casper Aquifer. These sources include the Soldier Springs Well, Pope Well Field, Turner Well Field, and Spur Well Field. On an annual basis, water production from the well fields is slightly more

that half of the total system production. The conjunctive use of these sources has allowed the City great flexibility in meeting its municipal water demands.

In addition to the quality water resources already in use, the City has access to undeveloped water resources with excellent water right standing. The City owns the Monolith Ranch and the associated agricultural water rights, both surface and groundwater. These supplies will be converted to municipal use as the City demand increases. The strategic management of these important rights was recently studied¹, and recommendations for water rights management are currently being implemented.

Laramie is very fortunate to have current and future water supplies, of quantity and quality suitable for municipal growth well beyond the planning horizon of this comprehensive plan. The supplies should accommodate a municipal demand beyond twice the present day demand. At the same time, though, it is important for the community to be cognizant of its water usage as the immediate area and the state continue to confront drought conditions. Therefore, proactive water conservation measures are warranted and advocated by this plan. These measures may include such programs or improvements as service metering, conservation rate structures, water accounting (large volume user audits) and loss control, landscape efficiency, water use restrictions, rebates and incentives, reuse and recycling, and public education. In addition, a drought management strategy for the Monolith Ranch, furthers the water conservation efforts for the city.

A water pressure zone is a geographically defined area within which the water pressure is designed so as not to exceed acceptable limits or fail to meet minimum standards. The maximum standard per the Uniform Plumbing Code is 80 pounds per square inch (PSI) while the minimum standard is 35 PSI per the Wyoming Department of Environmental Quality (WDEQ).

Water Treatment

Surface water treatment is performed at a conventional treatment plant about 20 miles southwest of the City. The process includes alum addition (coagulant) followed by clarification, up-flow filtration, and disinfection using chlorine. The plant has undergone many modifications since its original construction in 1964. The present operation is regionally noted for a high quality product, a testimony to the operator skill. With increasingly stringent water treatment requirements, the plant may some day require complete reconstruction. That possibility is currently being evaluated in a State-funded study of the entire water system.

Ground water treatment is performed at three locations, at the Wye (Soldier and Pope Wells), City Springs (Turner No.1 and No. 2 wells), and the Spur Wellfield (Spur No.1 and No.2 Wells). Because of excellent source water quality, treatment at these locations is limited to chlorination and fluoridation. The continued use of this high quality and low cost supply is dependent on the successful management and protection of the Casper Aquifer (refer to *Chapter 3, Community Character* for more information about aquifer protection).

Water Distribution and Storage

Laramie’s water distribution includes seven pressure zones and five storage tanks, as indicated in *Map 6.1, Water Distribution Deficiencies*. The map also indicates areas that are

¹ City of Laramie Management Plan for Water Rights on Monolith Ranch, Volume I and II, May 2004

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currently experiencing low water flows while meeting the peak water demands of the system. The map also shows areas generally not able to serve a legislated fire flow. These fire flow deficient areas are those that cannot meet the flow requirement but do have the minimum pressure requirement satisfied - 35 pounds per square inch (PSI).

The condition and capability of the transmission, storage, and distribution system was last comprehensively characterized in the 1995 Master Plan² and, subsequently, in a Level II study in 1996³. At this time, there were many noted deficiencies, such as limited water supply, water storage and volume deficiencies, and corrosion of main transmission pipelines. Since the mid 1990s, there have been significant upgrades and modifications to the water supply and distribution system, including:

- ♦ Corrosion control programs implemented on the transmission pipelines between Sodergreen Reservoir (located 19 miles west along S.R. 230), the water treatment plant (WTP), and the City.
- ♦ Replacement of the 24-inch transmission line through the City.
- ♦ Installation of the Spur Well Field water supply and transmission system.
- ♦ Installation of the West Laramie Transmission Line to the Airport, including a 1.0 million gallon water tank.
- ♦ The East Side Tank project and its associated transmission lines are nearing completion. This project will bring 1.0 million gallons (MG) of storage into Zone 4. Zone 3 may receive an additional 1.4 MG of storage in the future (refer to *Map 6.1, Water Distribution Deficiencies*, for the zone locations).
- ♦ The 8.0 MG tank was rehabilitated; the Zone 2 tanks painted and modifications made to the water treatment plant clear well.

Even with the notable improvements over the last decade, there remain several challenges to maintaining and improving the functionality and reliability of the transmission, distribution, and storage system. Some of these challenges include:

- ♦ A water main replacement strategy to upgrade failing mains;
- ♦ Fire flow capacity improvements within several areas of the oldest pressure zones (1 and 2); and
- ♦ Extension of adequate service and maintenance to new developments within and at the fringes of the current distribution system, including areas within the City limits and those designated by this plan for future growth.

At the present time, the City is participating in a State-funded water management plan that is evaluating the following:

- ♦ Hydraulic adequacy of the existing water transmission, distribution, and storage;
- ♦ Modifications to the existing system to improve hydraulic performance;
- ♦ Conceivable future modifications to the system to accommodate planned changes in land use, population growth, and the incorporation of new water sources;
- ♦ The construction of an untreated, non-potable water system for serving green space, such as parks and the golf course; and
- ♦ Improvements to existing well systems.

² City of Laramie Water Supply Master Plan, Level 1, November 1994

³ City of Laramie Water Supply Master Plan, Level II, June 21, 1996

The **East Side Tank project** is a new water storage tank located north of Grand Avenue on the east edge of town (north of the Imperial Heights subdivision).

SANITARY SEWER SYSTEM

Sewage Collection

Wastewater collector lines are those that collect wastewater from individual properties – residences and businesses – where it gravity flows or is pumped to **major interceptor lines**, which conveys the wastewater to the treatment plant.

Laramie’s sanitary sewer collection system was originally installed in the early 1900s and consisted mainly of 6-inch diameter pipe. In 1973, collector lines were extended to serve the West Laramie area and the major interceptor lines were expanded. Additional improvements to interceptor lines were completed in 1982. Other improvements included the addition of a 15-inch collector line flowing south along 21st Street.

The sanitary sewer system consists of approximately 82 miles of pipeline ranging in diameter from 6 inches to 27 inches. The lines were originally constructed of clay, while some concrete lines were installed after 1960, and poly vinyl Chloride (PVC) was generally used after 1970. Clay lines were constructed using caulked bell and spigot joints that are susceptible to leakage due to pipe movement and tree roots. Lines constructed out of concrete are susceptible to corrosion attack caused by a chemical reaction to wastewater gases, such as hydrogen sulfide generation.

The most recent comprehensive study of the sanitary sewer system was performed in 1986⁴. The study focused on 11 separate major wastewater lines serving various parts of the City. Peak flows were projected at the end of a 25-year planning horizon for a population of 35,000 persons to identify potential problem areas and the upgrades needed to alleviate any future problems. Problem areas reported from the study include a number of capacity deficiencies of several interceptor lines. These deficiencies constrain the amount of current and any additional wastewater flows. Thus, there are capacity improvement needs for each of these lines in order to sustain current flows and accommodate additional flows of new development. Upgrades of some of these lines are currently underway (*Map 6.2, Wastewater Improvements*).

Since the 1986 study, additional local studies have been performed for the sewage collection system. Upgrades to the collection and outfall lines are currently underway. Current improvements to the system and future issues related to sewer collection include:

- ♦ Wastewater service to the Laramie Regional Airport;
- ♦ South of Laramie Water and Sewer District;
- ♦ Interceptor improvements in the alley immediately west of Cedar Street to provide additional capacity;
- ♦ Interceptor improvements from Canby north to the main lift station and Spring Creek from 11th Street to 15th Street, which is currently under design.
- ♦ The need for immediate upgrades to the main sewer lift station; and
- ♦ Future improvements to the West Laramie lift station (at the plant) and the Adams lift station.
- ♦ Future development of a South of Laramie Sewer Study.
- ♦ All related Goals and Action Statements listed in this plan.

⁴ Sanitary Sewer Master Plan, HDR Infrastructure, 1986

Wastewater Treatment

Prior to the late 1990s, Laramie’s wastewater treatment facility was operating inefficiently and in need of improvement. The present treatment facility, completed in 1999, consistently meets Environmental Protection Agency (EPA) requirements. The plant currently treats about 4.5 million gallons per day (MGD), and is designed to treat up to 6.0 MGD. The plant appears well-equipped and staffed to meet treatment needs for the present time. Based upon continued community growth, the wastewater treatment plant is in need of another digester and may require capacity improvements during the horizon of this plan.

STORM DRAINAGE SYSTEM

The City lacks a comprehensive stormwater management plan for the entire City Limits. In this absence, the City has been operating under several independent and loosely connected drainage planning documents for individual drainage basins. These documents were prepared at different times to support specific development projects or limited areas. These documents include:

- ◆ The East Campus Drainage Plan
- ◆ The North Laramie Drainage Plan
- ◆ West Laramie Drainage Plan
- ◆ Turner Tract Drainage Study

Displayed in *Map 6.3 Drainage Study Areas*, are the portions of the City that are covered by the above drainage studies and plans. This figure also shows that there are many areas of the City that do not have a management plan, including the majority of Downtown. Each property that is developed in these areas must provide its own storm water detention rather than utilizing regional detention facilities. Regional detention facilities can be located on properties of less development potential and provide for more efficient land use. Often, regional detention facilities can be incorporated into public parks or green spaces providing a benefit to the community rather than a development limitation on each individual property, the latter of which is the current situation.

In the areas throughout the City that do have storm water management plans the documents have made many recommendations for capital improvements to construct regional detention facilities and install properly sized storm sewers. However, very few of these recommended capital improvements have been constructed. This has resulted in land development, which should have the benefit of regional detention, either having to provide individual on-site detention or having no detention at all. There are large areas of Downtown that have no storm water detention other than what is provided in the curb and gutters and storm sewer.

A lack of detention and improper planning for future development has led to many areas which have undersized storm sewer. These undersized pipes quickly become overloaded in heavy rain events. When the storm sewers become overloaded the runoff begins to pool in parking lots and roadways creating a hazard and possibly leading to property damage. The City, and many residents,- have learned where many of these problem areas exist

through repeated experiences. A comprehensive storm water management plan for the entire City would not only formally identify the problem areas but could design the proper replacement size and be used to prioritize funding as it becomes available.

The Spring Creek channel is an important drainage way, collecting storm water runoff from the southern and eastern portions of the City and carrying it to the Laramie River. The hydraulic capacity of this channel is limited, however, at several points by bridge structures crossing it. Furthermore, properties along many of the reaches of the channel have been developed right up to the channel edge. Therefore, not only are these properties susceptible to flooding, but they also prevent widening of the channel. In short, the hydraulic capacity of the Spring Creek channel cannot be expanded without major bridge modifications and right-of-way acquisition. The channel's capacity is further restricted by the buildup of sediment from upstream. The City periodically removes this sediment in order to prevent backup and flooding. Without hydraulic capacity improvements, acquisition of additional right-of-way, and periodic clearing of sediment, this channel may overflow its banks causing localized flooding, possible property damage, and hence, risk the public health and safety.

In the future the City may be required to comply with the Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) Phase II Stormwater Quality Regulations. These regulations mandate that storm water quality meet minimum requirements. A few of the larger communities in Wyoming are beginning to address these Phase II requirements and are finding the cost of compliance to be significant. The City of Laramie is currently exempt from these requirements and, therefore, has no stormwater treatment facilities in use or in the design phase. A comprehensive storm water management plan for the entire City should include an examination of water quality issues in addition to the classic view of limiting quantity only.

SOLID WASTE

Currently, solid waste is collected curbside and disposed in a permitted Type I (based on 20 tons per day of total household refuse) sanitary landfill just north of the City on 9th Street. The landfill is composed of unlined disposal trenches. The landfill property has been designed to accommodate many more trenches thereby allowing its capacity to last near the planning horizon for this Comprehensive Plan.

Late in 2005, a preliminary groundwater contamination notice was issued by the Wyoming Department of Environmental Quality (DEQ). The notice indicated that there is a likelihood of ground water contamination, based upon the results of a modeling study by the DEQ. In order for the City to expand the facility it will be required to line the disposal trenches to avoid further contamination. Therefore, despite the adequate space, permit renewal will likely require that future landfill cells be designed for engineered containment, meaning encapsulation of wastes to eliminate liquids from contaminating the ground water.

National Pollutant Discharge Elimination System (NDPES) is part of the Clean Water Act requiring municipal and industrial wastewater treatment facilities to obtain permits which specify the types and amounts of pollutants that may be discharged into water bodies. Phase II regulations address stormwater discharges from small Municipal Separate Storm Sewer Systems (MS4) and construction sites that disturb 1 to 5 acres. Construction activities that disturb one acre or more are regulated under the NPDES stormwater program.

DEQ contributes to Wyoming's quality of life through a combination of monitoring, permitting, inspection, enforcement and restoration/remediation activities which protect, conserve, and enhance the environment while supporting responsible stewardship of our state's resources.

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Collection is performed twice weekly by City crews and private trash services. The City has attempted to institute an automated trash collection system, but has met public resistance despite what appears to be a strong economic argument in favor of automation. The source of the resistance is due to possible added costs, changes in the size of new containers, and a possible reduction in the number of weekly pick-ups.

The City recycling program, performed at the landfill, is limited to the salvage of some steel, appliances, tires, wood, batteries, and waste oil. Steel and appliances are sold to area recyclers and removed from the landfill once a year, tires are shipped to Utah by a local hauler, and the wood products including Christmas trees are chipped and made available as mulch to the general public. Waste oils and rechargeable or lead acid batteries are accepted at the Street Department Shop or the landfill. The landfill permit does not allow the City to dispose these items. Electronic waste disposal is also an issues that is being addressed by the City. Currently drop-off locations are being considered for the landfill as well as off site locations. In addition drop-off programs are planed to be instituted on a bi-annual or quarterly basis.

There is no public curbside recycling program. There is at least one local private enterprise that performs this function. The concept of curbside recycling was studied several years ago, but not considered in detail since ARK Industries began operation. ARK Industries performs recycling of paper, metals, plastics, and glass using five drop-off centers and their sorting area on South 3rd Street. The recycled materials are sold on the open market.

UTILITY SYSTEMS GOALS AND ACTION STATEMENTS

In this section the goals and action statements for each element of the plan are set forth. The goals and action statements are to be used as a starting point to achieve the overall vision of this plan.

Water Supply, Treatment, Distribution and Storage Goals and Action Statements

1. Implement the recommendations provided by the 2006 Water Management Plan, Level II Study, including:
 - a. Construction of the Laramie River Water Intake Pipeline to the Water Treatment Plant.
 - b. Modifications at the Turner Wellfield.
 - c. Additional study of irrigation and conservation measures.
 - d. Accelerate the high priority water mains replacement program.
 - e. Upgrade the distribution system to provide required peak hour service pressures and fire suppression capabilities in Zones 1 and 2.
2. Maintain water rights to provide for future expansion by adhering to the 2004 Monolith Ranch Water Rights Management Plan. The Monolith Ranch Water and Agricultural Plan should continue to be followed.

- a. Develop the Monolith Ranch Recreation Plan. This plan could be done in conjunction with the Parks and Recreation Master Plan.
3. Strictly enforce and implement the Casper Aquifer Protection Plan and begin working on the updates to the Plan. Issues such as conservation, water quality, monitoring, availability, demand and threats along with issues mentioned in this plan should be incorporated into the new plan (*Chapter 3, Community Character*).
4. Replace existing canal use with a pipeline from the Laramie River to the Water Treatment Plant to ensure river supply availability during drought conditions. Sources of funding may include the Wyoming Water Development Commission.
5. Water and sewer facility standards should be replaced with the standards that give them the longest life and quality available at this time. This should help reduce the backlog of maintenance.
6. Adopt a dead-end water main restriction policy to preserve adequate flows, increase circulation, and prevent staling water.
7. Prioritize annual water main replacements in the City budget.
8. Follow through with the initiated cooperative efforts between the City, County, and the Wyoming Department of Environmental Quality (WDEQ) to agree on the aquifer protection area.
9. Develop a contingency plan for an emergency event in which the aquifer becomes contaminated.
10. Develop standards for when developments outside of the city limits must hook up to city services. This may include distances, number of units, etc.
11. Research and consider using raw, untreated water or grey water systems for irrigation of landscaping. Other methods of water conservation should be considered.

Sanitary Sewer System Goals and Action Statements

1. Continue to implement the recommendations of the 1986 Master Plan by HDR Infrastructure, including the expansion or extension of several sewer reaches; among them Cedar Street in West Laramie, and the Spring Creek interceptor.
2. Monitoring and periodic sanitary sewer planning updates.
3. Implement the recommendations of the 2004 Turner Tract Sanitary Sewer Study, including:
 - a. Upgrades to several sewer reaches that are surcharged under present conditions or would become surcharged under build-out conditions and do not meet current WYDEQ requirements.
 - b. Improvements to the A-line near Reynolds Street reiterates the need for sewer upgrades at an estimated cost for the upgrades at 5.4 Million (2004) dollars.
4. Implement the recommendations of the 2005 Reynolds Street Sanitary Sewer Study, which identified the same section of the A-line given as one of the deficient target reaches found in the 2004 Turner Tract study and the 1986 Master Plan.

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5. Complete a community-wide wastewater master plan, which may be funded by SLIB grants or Community Ready funds.
6. Develop standards for when developments outside of the city limits must hook up to city services. This may include distances, number of units, etc.

Solid Waste Goals and Action Statements

1. Evaluate alternatives to land filling trash, including possible shipping to other municipalities, recycling, and composting.
2. Educate the public regarding automated collection. Subsequently, evaluate the feasibility of automated collection and obtain funding.
3. Begin dialog with the Wyoming Department of Environmental Quality (WDEQ) regarding landfill contamination issues.
4. Perform an analysis of the costs and benefits associated with a comprehensive recycling program as well as possible sources of funds for managing such program. Cooperation with ARK should be considered as a viable option. Public education on the benefits of recycling should be pursued.
5. Establish drop-off locations for electronic waste at the landfill and at off site locations. Electronic waste drop-off should be done on a bi-annual or quarterly basis.
6. Perform an analysis of technologies and programs such as biomass energy production, methane gas production or composting programs that could generate revenue for solid waste while conserving and reducing biomass in the landfill itself.
7. Implement and develop procedures to reduce waste in an effort to save landfill space. Examples include composting for yard waste, e-waste pick-up and recycling.

Stormwater Goals and Action Statements

1. Complete a community-wide stormwater management plan, including updates to the existing drainage plans. This plan should address water quality issues as well as funding mechanisms.
2. West Laramie will need to provide paved streets with a drainage system. This must be done to provide proper drainage and save the excessive maintenance costs for this area.
3. Adopt the drainage policy and management plan into the City codes.
4. Adopt uniform drainage design policies, practices, and standards.
5. Adopt a Spring Creek channel maintenance plan. Subsequently, educate the public on the benefits of the plan.
6. Implement best management practices for prevention of stormwater contamination.
7. Educate the public on the importance of avoiding stormwater contamination by way of discarding paints, used oil, gasoline, and vegetation brush, among other items.