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# GRANGER WATER SUPPLY MASTER PLAN - LEVEL I -EXECUTIVE SUMMARY-

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OCTOBER, 2000

Submitted to the:

**WYOMING WATER DEVELOPMENT COMMISSION**



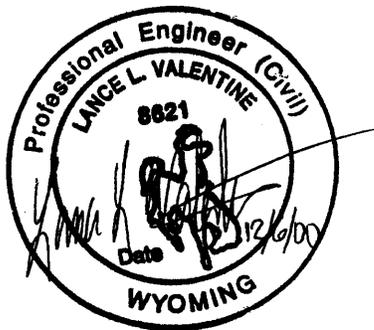
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**F O R S G R E N**  
ASSOCIATES / INC.

# GRANGER WATER SUPPLY MASTER PLAN

## LEVEL I STUDY EXECUTIVE SUMMARY



OCTOBER 2000

Submitted to:  
WYOMING WATER DEVELOPMENT COMMISSION

Prepared by:  
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## **SECTION 1.0 EXECUTIVE SUMMARY**

### **1.1 PROJECT OVERVIEW & HISTORY**

The Town of Granger presently has a population of approximately 125 people, who are served by a community water system that delivers water to 86 non-metered connections. The Green River, which is located approximately 16 miles to the northeast of Granger, is presently the town's sole source of raw water. In the late 1970's, the town constructed a pipeline from the Town of Granger east to the FMC trona plant, a distance of approximately 10.2 miles. At FMC, this pipeline ties into the FMC raw water pipeline that extends an additional 7.5 miles to the Green River. It should be noted that the water supply agreement executed between the Town and FMC contains a "30-day notice" cancellation clause that places the town's water supply at risk.

In 1990, a Level II Feasibility Study was requested by the Town to address long-term water supply needs. That study recommended a new transmission pipeline and a shallow well field designed to serve Granger. Estimated cost for that pipeline was \$2.4 million (1990 construction costs). This option was never implemented, presumably due to the high costs involved.

The Town continues to have serious concerns relative to the security of their long-term supply and water quality regulatory compliance. The age of Granger's treatment plant combined with the lack of control over their source of water prompted the town to request assistance from the WWDC, the result of which is this Level I study.

### **1.2 STUDY AREA**

The project study area primarily includes the incorporated Town of Granger in Sweetwater County, Wyoming (see Figure 1.1). It should be noted that there is a Little America facility located approximately 12 miles southeast of Granger. Little America is a large travel center complex that includes a 140-room motel, swimming pool, restaurant, gift shop, gas station, repair shop, convenience store, and employee housing. Consideration has been given to Little America as part of this study to the extent that both entities could benefit from using shared resources.

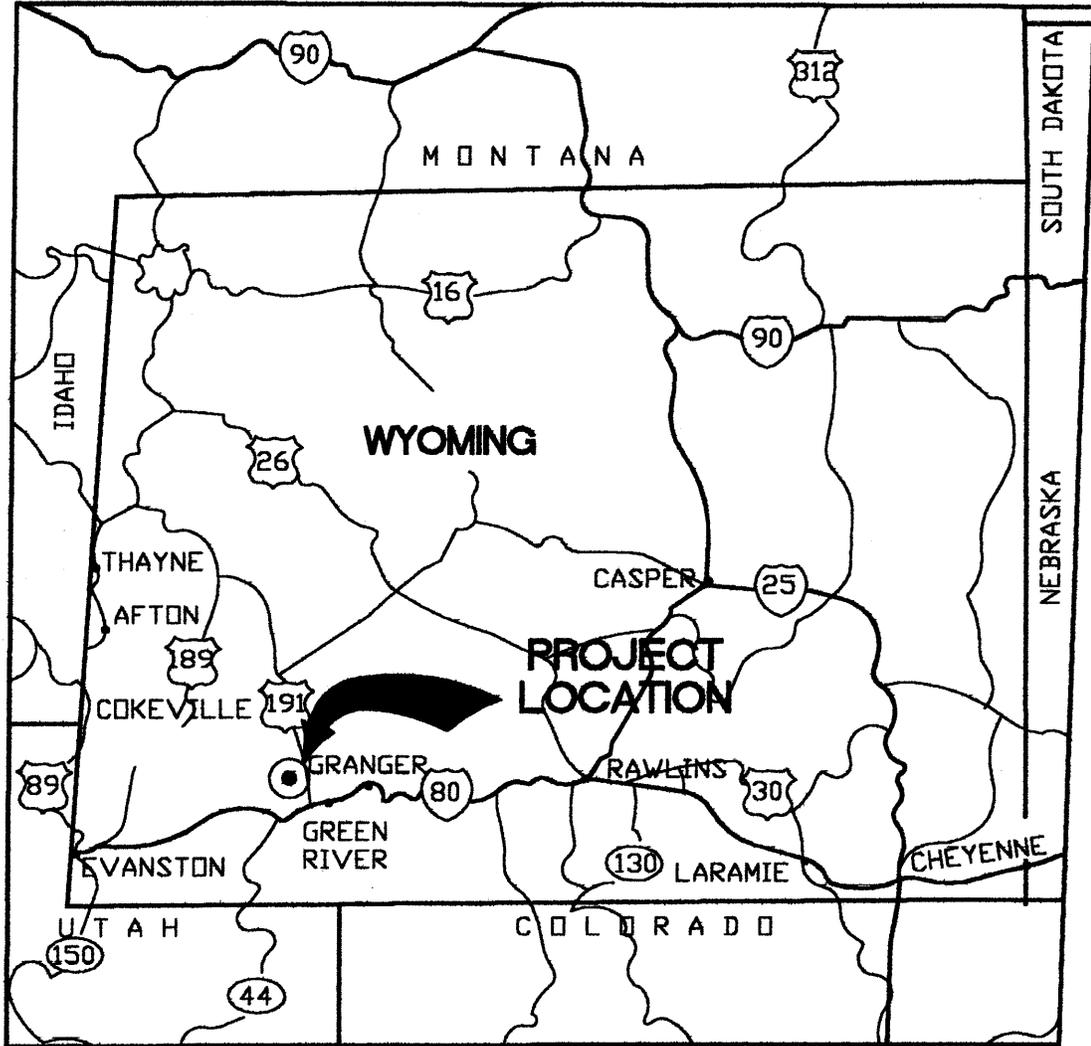
### **1.3 DESCRIPTION OF EXISTING SYSTEM**

#### **1.3.1 EXISTING GRANGER SYSTEM**

##### **1.3.1.1 Water Supply Source**

Granger presently obtains its municipal water from the Green River through a pipeline system that first goes to the FMC trona mine operations and then on to the Town of Granger. This pipeline system is approximately 17.7 miles in combined length and includes a 20-inch diameter steel pipeline to the FMC plant and an 8-inch diameter PVC pipeline to the Town of Granger. Figure 1.2 shows the Granger water supply pipelines from the Green River.

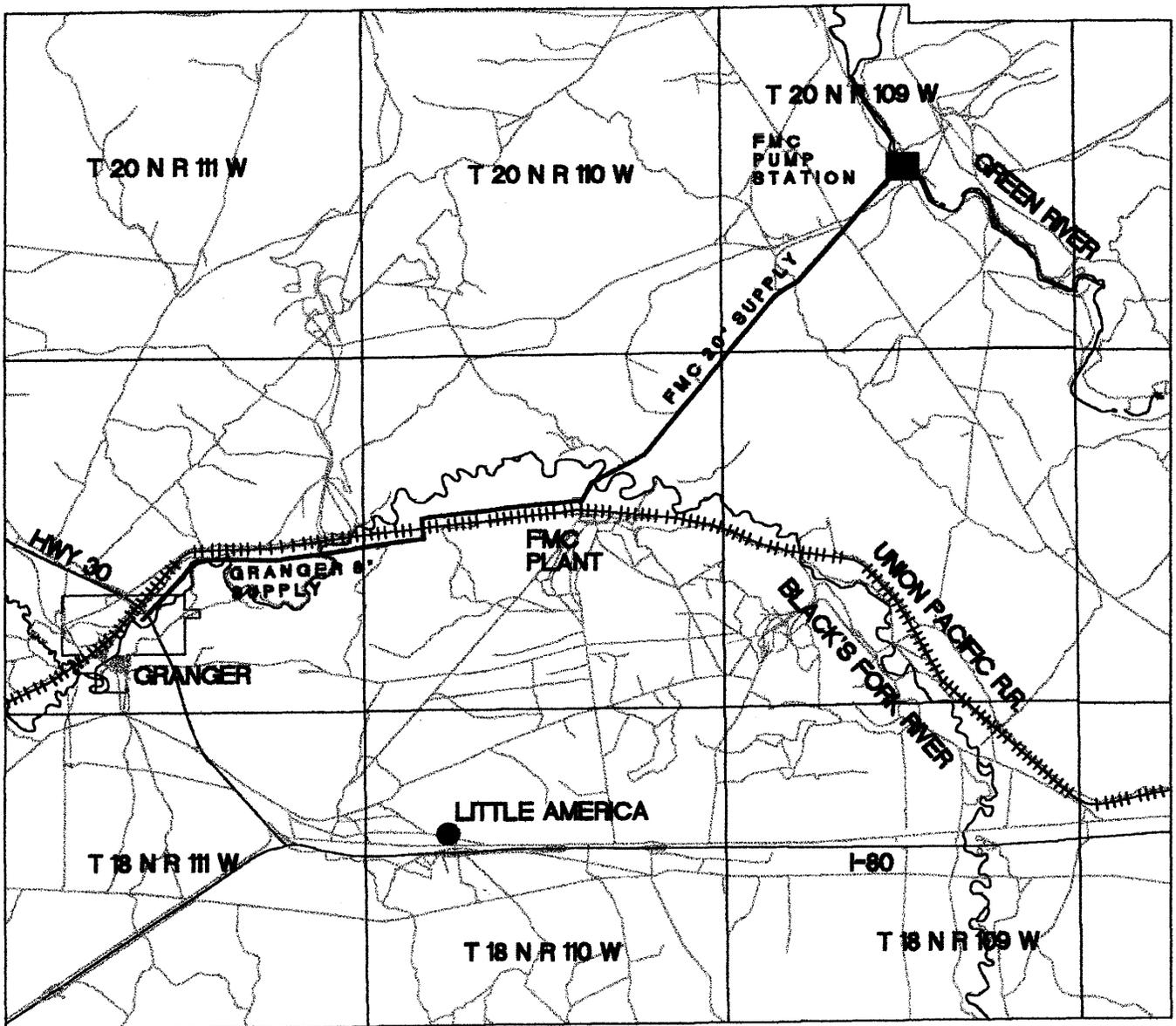
The Town of Granger began using Green River water as its municipal water supply in the late 1970's. Prior to that time, the Town was taking its municipal water from the Ham's Fork River. The Ham's Fork had historically been unreliable as a supply from both a quantity and a quality basis.



**PROJECT LOCATION MAP**

FIGURE 1.1

FIGURE 1.2  
GRANGER WATER SUPPLY PIPELINES



**FMC Water Supply Agreement:** A written agreement was signed in August 1978. This agreement is subject to certain conditions, one of which is a cancellation clause which allows FMC to stop delivering water with just 30 days notice. In addition, another clause allows for the interruption of the water delivery at any time, for any duration, and for whatever reason.

**FMC Transmission Line:** Discussions with FMC personnel this summer indicate a possible need to temporarily take that pipeline out of service for maintenance work. If that were the case, other means of obtaining water supply for Granger would need to be implemented. The FMC plant does have other water supply lines to meet their water needs. However, Granger's supply is wholly reliant upon that single pipeline.

**Granger Transmission Pipeline:** This pipeline was constructed and put into service in 1978. The pipeline is an 8-inch diameter PVC pipeline extending approximately 10.2 miles from the FMC plant to the Town of Granger.

Because Granger's water supply is dependent on FMC and their pumping operations at the Green River, the Town of Granger has little control of the flow and the pressure of the water in this transmission line. At times, the flow and pressure reaching the treatment plant is not adequate for proper operation of the treatment plant. At other times, they have both adequate flow and pressure reaching the treatment plant through the transmission lines.

#### **1.3.1.2 Water Treatment Plant**

**Facilities Characterization:** The Town operates a manufactured package water treatment plant. The package treatment unit is housed in a metal building with dimensions of 23'-0" wide x 26'-0" long x 12'-0" high (interior dimensions).

Originally, this plant was designed and operated as a completely automatic unit. It has been many years since this type of automation and control has been useful to the operators of this plant. This plant has been manually operated for quite a few years with most of the automation having been removed or non-operable.

**Facilities Condition:** The overall condition of the process unit is good. The problems being experienced by the water operators are more related to the peripheral controls that have been significantly modified over the years as original control strategies have failed.

The steel building which houses the treatment equipment is inadequately sized for proper and safe operation and maintenance of the facility. When working on the process unit, for example, operators are required to climb up a wood step ladder tied to the side of the unit and stand on that ladder when performing surface wash down of any of the process bays. When access is needed to the basins, operators are required to crawl along wooden planks laid across the tank tops with nothing to hold onto and only 4'-4" of clearance between the tops of the tanks and the building roof.

The building also has inadequate ventilation. It is heated by a gas furnace that is outdated and in disrepair. The building's electrical system appears to be questionable with regards to code compliance and general safety.

**Finished Water Quality:** In recent history, the treatment plant has consistently been producing finished water with quality within water quality standards. There have been isolated events when finished water turbidity has been out of compliance for a short period of time. Such events have been the result of either breaks in their raw water transmissions line

or a rain event in the Green River basin that has quickly altered the characteristics of the raw water influent, and operators have been unable to manually adjust the chemistry quick enough to account for the change in influent water quality.

### **1.3.1.3 Finished Water Storage**

Granger's storage tank is a 500,000 gallon steel tank. Wyoming DEQ Water Quality Rules and Regulations sets water storage requirements based on both an average daily demand and a peak daily demand. Granger's storage tank meets both of those storage capacity requirements.

In 1999, the Town had the interior of the storage tank cleaned and inspected. Upon completion of that dive inspection and cleaning, it was recommended to the Town that the interior coating of the tank be stripped and re-coated. Large sections of interior wall were identified as having no coating. Some pitting and corrosion of the interior walls were noted. That work has not been done to date, likely due to the Town's budgeting constraints.

### **1.3.1.4 Distribution System**

Granger's water distribution system was replaced with PVC piping in the late 1970's and early 1980's. In about 1985, a new pipeline and booster pump station was constructed that served the Wyoming Department of Transportation Maintenance Shop located about (one) 1 mile north of Town. In addition to serving the WyDOT Maintenance, there are presently four residential connections and one commercial connection to this pipeline. Figure 1.3 shows the overall distribution system as it exists today. Figure 1.4 shows the central town portion of the distribution system.

The Town appears to be losing considerable amounts of water through leakage and/or unaccounted water use.

## **1.3.2 LITTLE AMERICA WATER SYSTEM**

Little America has both a separate water source and a separate treatment plant from Granger's. Little America uses the Ham's Fork as their primary source for raw water. Historically, they have experienced significant shortages in their source supply and have had to look to the Town of Granger for assistance. In 1992 Little America and Granger agreed to make a raw water interconnection whereby the Little America treatment plant could receive emergency supplemental raw water from Granger through their pipeline to FMC.

Little America's treatment facility is located on the bank of the Ham's Fork River, immediately west of the Town of Granger.

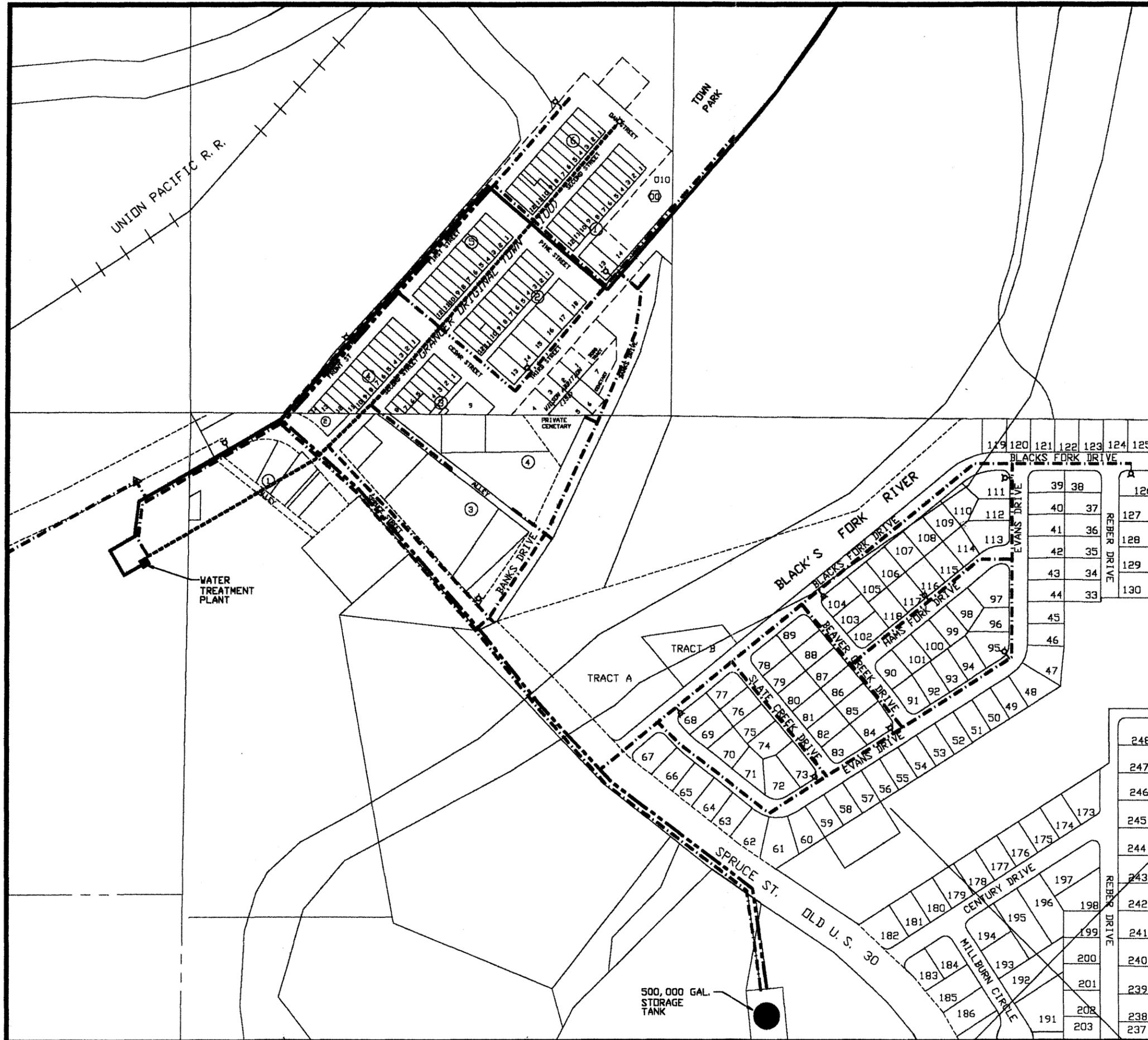
## **1.4 WATER SUPPLY CONSIDERATIONS**

### **1.4.1 IDENTIFICATION OF NEEDS**

#### **1.4.1.1 Projected Service Area Population**

If one were to conservatively assume a slight population increase of 1% annual growth over the next 30 years, the population projection for the year 2030 would be 170. This population nearly matches the population of Granger back in the early 1980's. The 1% annual growth rate has been conservatively adopted for the purposes of this study.





**LEGEND**

- 8" RAW WATER (PVC)
- - - 8" FINISH WATER (PVC)
- · - · 6" FINISH WATER (PVC)
- · - · 4" FINISH WATER (PVC)
- · - · 4" FINISH WATER (CI)
- ⊕ FIRE HYDRANT

BASE MAP SOURCE: SWEETWATER COUNTY SURVEYOR'S OFFICE  
 IMPORTANT NOTICE

Sweetwater County intends the contents of this map to be illustrative only and assumes no liability for actions taken by the user based on any error, omission or misrepresentation hereon. It is recommended that persons take no action based on the information shown on this map without verifying the same through thorough inspection of the official real property records maintained by the Sweetwater County Clerk.

TOWN OF GRANGER  
 TOWNSHIP 19 NORTH,  
 RANGE 111 WEST  
 SWEETWATER COUNTY,  
 WYOMING

FIGURE 1.4

NOT BUILT

**A FORSGREN ASSOCIATES / INC.**

#### **1.4.1.2 Recorded Water Use**

The Town of Granger does not have metered services. However, they have maintained good master meter records on treated water production. They have also kept good records on bulk water sales for industrial use.

**Bulk Sales:** The Town sells treated water in bulk to local industrial users that haul water in tanker trucks that are filled up at the treatment plant.

**Per Capita Water Use:** Since the Town of Granger does not have metered services, the per capita water use was estimated by taking the average daily production of the treatment plant and trying to account for the use of that production volume.

With a current population estimate of 125, Granger's peak day water usage is calculated to be 713 gallons per capita-day. Average summer use is calculated to be 424 gallons per capita-day.

#### **1.4.1.3 Projected Water Use Design Criteria**

The statewide average per capita water use for systems relying upon treatment plants is 230 gallons per person per day as presented in the "State of Wyoming, 2000, Water System Survey Report", published by the Wyoming Water Development Commission. It is felt that this water usage is more reflective of Granger's actual water need assuming that the Town is able to correct their problems with "lost" water in the system.

### **1.4.2 WATER RIGHTS CONSIDERATIONS**

The Town has three direct flow water rights. The more senior right is on the Ham's Fork. This right is for 0.57 cfs. The other two rights are to the Green River and to one of its tributaries. The Green River right is for 0.56 cfs. The other right is a seasonal right to 1.5 cfs between the dates of June 1 through August 31 from Cottonwood Creek.

#### **1.4.2.1 Available Water versus Legal Supply**

The water right on the Ham's Fork has the highest priority of all Granger's water rights. In addition, the Ham's Fork passes adjacent to the Town and would be a logical source of water for the Town. The problem is that this body of water is unreliable as a water source from both a quantity and a quality perspective. During this past summer, for example, the Ham's Fork nearly completely dried up.

## **1.5 ALTERNATIVES EVALUATION**

### **1.5.1 WATER SUPPLY ALTERNATIVES**

#### **1.5.1.1 Do Nothing**

It is believed that the "Do Nothing" alternative is not an option. There needs to be a modification of the agreement between FMC and Granger for current operations and practices to continue, or an alternate source of supply needs to be addressed.

### **1.5.1.2 Return to Ham's Fork Supply**

Due to the problems that the Town of Granger has experienced, it is not felt to be practical to rely on the Ham's Fork as their primary supply. It is possible to try and utilize the Ham's Fork as a secondary water source in the event that the Town was temporarily unable to get Green River water through their existing transmission system. The old diversion works are still on the Ham's Fork, and it may also be practical to share Little America's diversion works in the event of an emergency.

### **1.5.1.3 Groundwater**

Groundwater in the Granger area has historically been characterized by poor quality and limited yields. Groundwater as a source for the municipal water demands for the Town is not believed to be feasible based on the conclusions of previous studies.

### **1.5.1.4 Continued Use of Green River Water**

Continued use of the Green River as the primary water source for the Town of Granger is, in our opinion, the most practical alternative from a source reliability standpoint. The consistent availability of water and the water quality of the Green River make it the preferred source for Granger. For continued use of the Green River to occur, the Town will need to renegotiate a long-term agreement with FMC for the continued use of their pipeline. This agreement could include the emergency usage of Ham's Fork water if FMC were to have to temporarily take the FMC pipeline out of service for maintenance or repair.

### **1.5.1.5 Joint Water Supply Agreement with Granger and Little America**

With the interconnect between the Granger raw water transmission line and Little America's treatment plant completed in 1992, the Town and Little America both have the ability to utilize Green River water. Little America already purchases raw water from Granger as a secondary source when the Ham's Fork is too low in dry years. This arrangement was agreed to by FMC to help out when Little America is experiencing shortages.

It may be in both Little America's and Granger's best interest to cooperatively work with FMC to negotiate a long-term agreement for the utilization of the FMC pipeline. This would help in securing a long-term, reliable water source for both entities.

## **1.6 RECOMMENDATIONS AND CONCLUSIONS**

### **1.6.1 RECOMMENDED SYSTEM IMPROVEMENTS & MODIFICATIONS**

#### **1.6.1.1 Supply, Transmission, and Storage**

**FMC Agreement Revisions:** It is recommended that the Town of Granger renegotiate a long-term agreement with FMC for the continued use of their pipeline. This new agreement should, in our opinion, allow for Granger's permanent use of the pipeline, while still allowing FMC to shut off the pipeline for maintenance. It should also allow FMC to permanently shut off the pipeline, if needed, and establish conditions by which the Town of Granger could acquire the pipeline in the event that it was abandoned.

**Transmission Pipeline(s) Improvements:** It is recommended that the numerous air release valves along this pipeline be routinely inspected and maintained. Damaged air

release valves could lead to air locks in the pipeline and a significant reduction in available flow at the treatment plant. It is also recommended that the transmission line be flushed on a scheduled basis to help reduce sediment buildup.

Consistent raw water pressure and flow at the treatment plant has been an ongoing problem for the operators. It is recommended that a low-head booster pump be placed in the vault where the Granger transmission pipeline ties into the FMC transmission pipeline, and that this pump be controlled by pressure switch controlling on the upstream side of the pump. This booster pump would help with low influent pressures at the treatment, and some simple pressure controls on the pump could help maintain more consistent influent pressure and flow at the treatment plant.

#### **1.6.1.2 Storage Needs**

It is recommended that the storage tank be equipped with a transducer and communication line (radio or hard wire), thus allowing accurate tank level readings at the treatment plant.

It is recommended that the storage tank be re-lined to protect the inner tank walls from the observed corrosive pitting.

#### **1.6.1.3 Treatment Plant**

The water treatment plant has been meeting EPA water quality standards. There is concern that the plant, as presently operated and configured, represents a serious threat to the health and safety of the operators and the public.

There is also concern about the process controls and the lack of automation. Over the years, the process controls have been modified and/or deteriorated to the point that there remains minimal automation to the plant. An operator must be there on very frequent intervals to monitor the plant and to make manual adjustments to process controls.

It is recommended that the existing manufactured package unit be retained to serve the Town's treatment needs. It is also recommended, however, that new process controls be added to the treatment plant.

As indicated above, there is also serious concern about worker safety at the treatment plant. The building is too small to hold the process unit, the clearwell, the transfer pump station, and the small table for laboratory work and record keeping. Of more concern are the electrical system and the heating/ventilation system within the building. It is felt that this building and its systems would not meet current building codes, electrical codes, fire codes, or OSHA regulations.

Due to the lack of process controls and automation, the facility places the general public at risk relative to water quality and treated water supply. In addition, the day-to-day operation of the treatment plant clearly places the workers at risk.

It is recommended that the Key-Tech package unit be removed and placed in a new, larger building to be built at the existing site. This larger building would be of adequate size to house the package treatment unit, the recommended process controls, the necessary laboratory work, and provide storage of process chemicals. In addition, a new clearwell should be constructed that lies below the treatment unit to eliminate the need to pump

finished water twice; once from the unit to the clearwell and then again from the clearwell to the storage tank.

#### **1.6.1.4 Distribution System**

Presently, the Town appears to be producing more water than can be accounted for. There is concern that there is a leak(s) in the distribution system. Such leakage could significantly impact Granger's water use and related infrastructure needs. Leak testing is recommended to identify problems.

It is recommended that a new water line be constructed that ties First Street to Second Street along Oak Street. There is no looping of water lines in these two streets beyond Pine Street to Oak Street. The WaterCADD model simulation indicates a lack of fire flow capacity in the pipeline down Second Street to Oak Street. With the school located on this block this water line loop becomes of even greater importance.

#### **1.6.1.5 Metering**

Individual meters are recommended to allow the Town to better track actual water consumption (and leakage) in the future. This can be a valuable management tool for system planning and operation. It should also be noted that individual meters are a valuable conservation tool. Meters are a requirement of many State and Federal funding agencies.

#### **1.6.1.6 Joint Water Supply Agreement with Little America**

It is recommended that the Town of Granger negotiate an agreement with Little America for the use of Little America's intake facilities on the Ham's Fork for use in an emergency. Such an emergency would be if FMC were to take down their pipeline for maintenance work. This agreement should, in our opinion, allow for the continued wholesale purchasing of Green River water by Little America for emergency supplementation. This agreement could also allow for sharing of water operators to help cut down operational costs at each of the two facilities.

### **1.6.2 ECONOMIC DATA**

#### **1.6.2.1 Cost Estimates**

The estimated cost for the recommended system improvements total \$ 593,600 as summarized in Table 1.1.

**TABLE 1.1**  
**Preliminary Project Budget**  
**Proposed Granger Water System Improvements**

Item	Description	Construction Cost	Other Cost
1	Treatment Plant Relocation & Process Controls	\$290,000	
2	Transmission Pipeline Booster Pump with Pressure Switch Controls	\$2,500	
3	Storage Tank Interior Stripping & Coating	\$75,000	
4	6-inch PVC water line loop at Oak Street	\$5,800	
5	Water service meters (68 connections)	\$61,200	
	<b>Subtotal</b>	<b>\$434,500</b>	
	Preparation of Plans & Specs (10%)		\$43,450
	Permitting		\$500
	R.O.W Acquisition		\$0
	Construction Engineering (10%)	<u>\$43,450</u>	
	<b>Const. Subtotal</b>	<b>\$477,950</b>	
	Construction Contingency (15%)	<u>\$71,690</u>	
	<b>TOTAL ESTIMATED COST</b>		<b>\$593,600</b>

**1.6.2.2 Project Financing**

It is practice for WWDC to fund eligible projects with a 50% grant and a 50% loan at 7 1/4% annual interest over a period of 20 to 30 years. Items considered eligible for WWDC funding include: water supply, transmission pipelines, and storage tanks. Items considered ineligible for WWDC financing can possibly be funded through the State Loan and Investment program with 50% grant and 50% loan (7 1/4% interest, 20-30 years).

It may be possible to obtain grant funding (up to \$250,000) from HUD through a Community Development Block Grant (CDBG) with serious health and safety risks being mitigated by this proposed work. Due to the lack of process controls and automation at the treatment plant, it is believed that the facility places the general public at risk relative to water quality and treated water supply. In addition, the day-to-day operation of the treatment plant clearly places the workers in serious jeopardy.

Other possible funding sources include an Abandon Mine Lands grant, or a low-interest loan from Wyoming's State Revolving Loan Fund.

This project may also be eligible for Federal funding assistance through the USDA Rural Utility Service, (RUS, formerly FMHA). The RUS program favors "low to moderate" income communities. Funding eligibility is currently based on the most recent (1990) census data showing Wyoming's non-metropolitan median household income to be \$26,148. Communities with median incomes less than 80% of the state average (less than \$20,918) are classified as "poverty communities" and are generally good candidates for RUS project funding involvement. Communities with median household incomes between 80% and 100% of the state median income are classified as "intermediate income communities".

The 1990 census indicated that the median household income for the Town of Granger was \$21,523.

It should be noted that funding availability is increasingly tight on both the State and the Federal level. That fact could influence funding formulas and policies relative to this and other future projects.

**Probable Project Funding:** Based on past funding practices, we would not expect the water treatment plant improvements to be eligible for WWDC funding. However, water treatment plant improvements could be eligible for CDBG funding, up to \$250,000, for health and safety mitigation. The project could also be eligible for State Loan & Investment Board funding.

A possible project funding scenario involving these two agencies is shown in Table 1.2.

**TABLE 1.2**  
**Typical Project Funding**  
**Proposed Granger Water System Improvements**

Funding Source	Amount
WWDC Grant (60%)	\$ 0
WWDC Loan (40%)	\$ 0
CDBG - Grant	\$ 250,000
State Loan & Investment Board - Grant	\$ 279,200
State Loan & Investment Board - Loan	\$ 64,400
<b>Total</b>	<b>\$ 593,600</b>
Annual Loan Payment (7.25%, 30 year)	<b>\$ 5320</b>
Monthly Rate Impact (68 present conn.)	<b>\$ 6.50 / month</b>

**1.6.2.3 Projected User Rate Impacts**

The estimated rate impact for the proposed water system improvements is \$ 6.50 per connection per month as shown in Table 1.2. This rate impact is based on 68 current connections, using funding from CDBG and SLIB. This represents a 21.7% increase over the present \$30.00/month use rate.

**1.6.3 WHERE DO WE GO FROM HERE?**

It is recommended that this project be advanced for a Level II Study. Primary Level II activities should include:

- Refinement of recommended improvements concepts and costs.
- Assistance with re-negotiation of FMC agreement.
- Assistance with negotiation of Little America agreement.
- Leak testing and refinement of water use projections.