



Executive Summary

City of Lander

Master Plan Level I Study

August 2, 2023



EXECUTIVE SUMMARY

For

CITY OF LANDER

Prepared for:

WYOMING WATER DEVELOPMENT COMMISSION

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1 Background and Purpose

The City of Lander’s last Water Master Plan, completed in 2011, focused on addressing significant hydraulic issues within the City’s water transmission and distribution system. Since that time, construction projects implemented by the City have largely resolved the hydraulic issues identified in that report.

In anticipation of the next twenty years, the following were identified as planning focus areas to help achieve the City’s goals:

- Water Supply – Evaluating the adequacy of the City’s water supply to meet future growth and expansion over an extended planning period up to 50 years.
- System Expansion – Establishing transmission main corridors, pressure zone limits, and pipeline size requirements for localized system expansion.
- Regionalization – Evaluating the possibility of teaming with other systems in Fremont County to withstand staffing, regulatory, funding, and supply challenges.
- Reliable Service – Enhancing dependability of the City’s water system infrastructure.
- Fiscal Responsibility – Conducting sufficient financial planning to meet future demands and maintain the system.

The purpose of this study is to provide recommendations for the City to help them successfully meet their goals.

2 Findings

Key findings pertinent to the City’s goals are summarized in this section.

2.1 Water Supply

While analysis indicates that the City won’t exceed the hydraulic capacity of the water treatment plant for another fifty years, the service area Maximum Day Demand is set to exceed the total water rights through the treatment plant within forty years if no changes are made. Figure 6-1 indicates this.

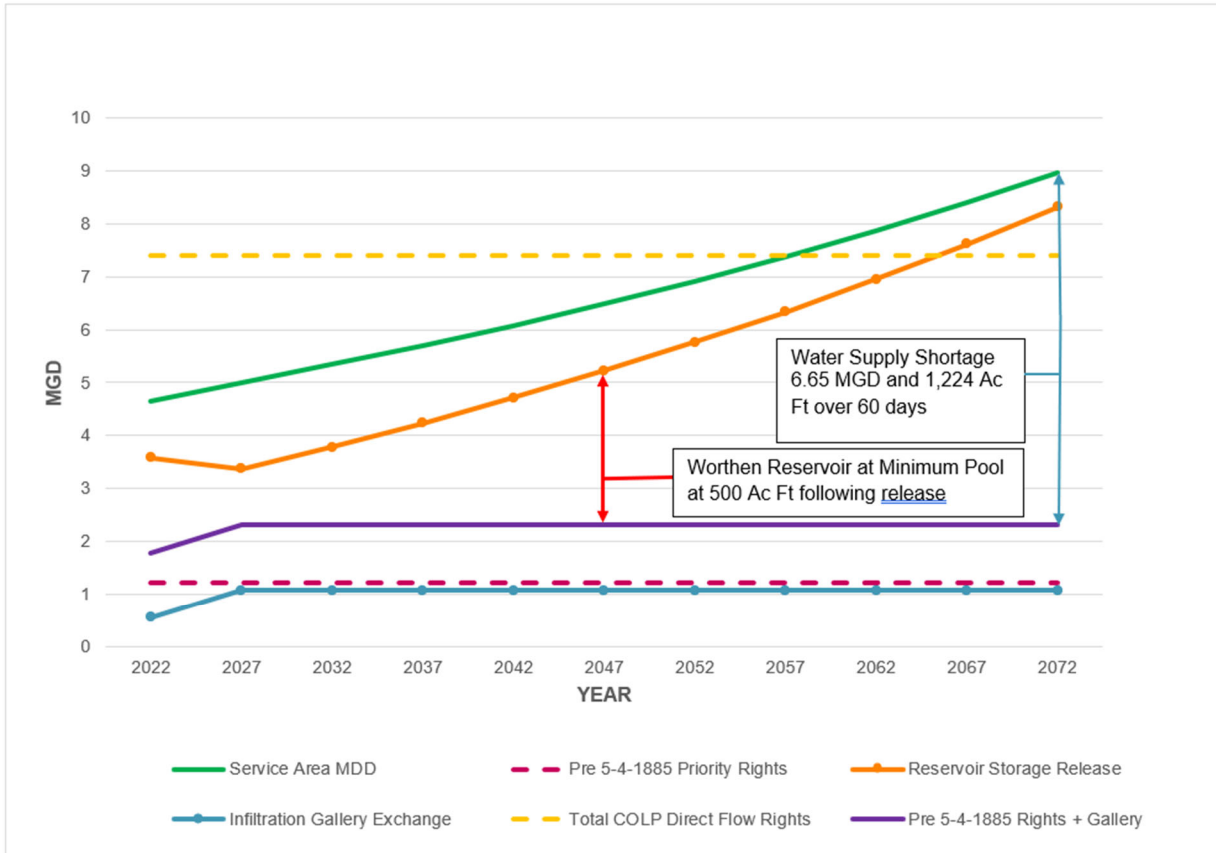


Figure 6-1 Lander Water Service Area Future Water Demands and Source Yields

To meet the existing and the projected maximum day demands in the next fifty years, the City will need to take some or all of the following actions:

- Continue to utilize direct flow surface water diversions from Middle Popo Agie River at the City of Lander Pipeline (COLP) intake,
- Continue to utilize storage water released from Worthen Meadows Reservoir in exchange for out-of-priority COLP diversions and the potential expansion of municipal storage within the Reservoir,
- Pursue rehabilitation and maintenance to improve and maintain yields of the existing infiltration gallery that discharges to the Middle Popo Agie River in exchange for out-of-priority COLP diversions,
- Implement water conservation incentives in the high demand periods in summer,
- Pursue irrigating large City-owned green areas with a raw water irrigation system to reduce peak demands for treated water in the summer, and,
- Pursue acquisition and transfer of existing senior water rights and/or new or existing groundwater wells potentially targeting the Tensleep aquifer at locations west of Lander.

Also of interest is the amount of increased storage at different elevation increases at Worthen, as provided in Figure 2-1.

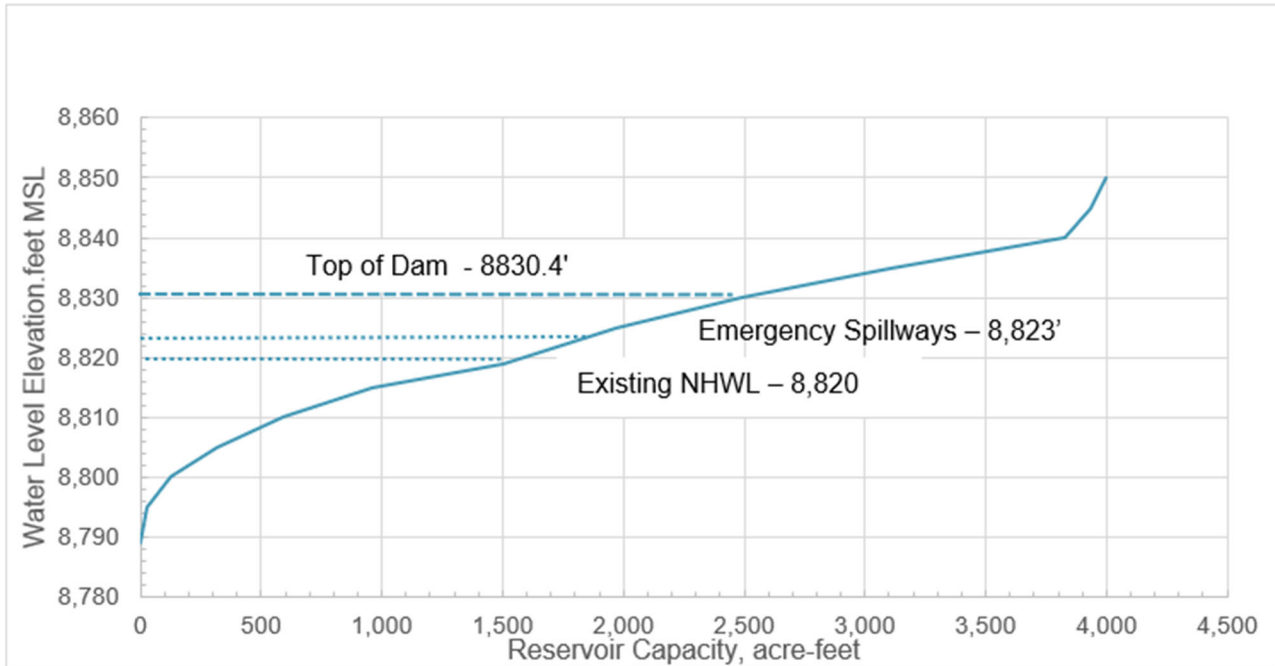


Figure 2-1 Worthen Meadows Reservoir – Stage to Storage Curve

Several candidates were examined for a non-potable irrigation system based on high usage. Table 8-3 summarizes these annual water demands that could be removed from the potable water system.

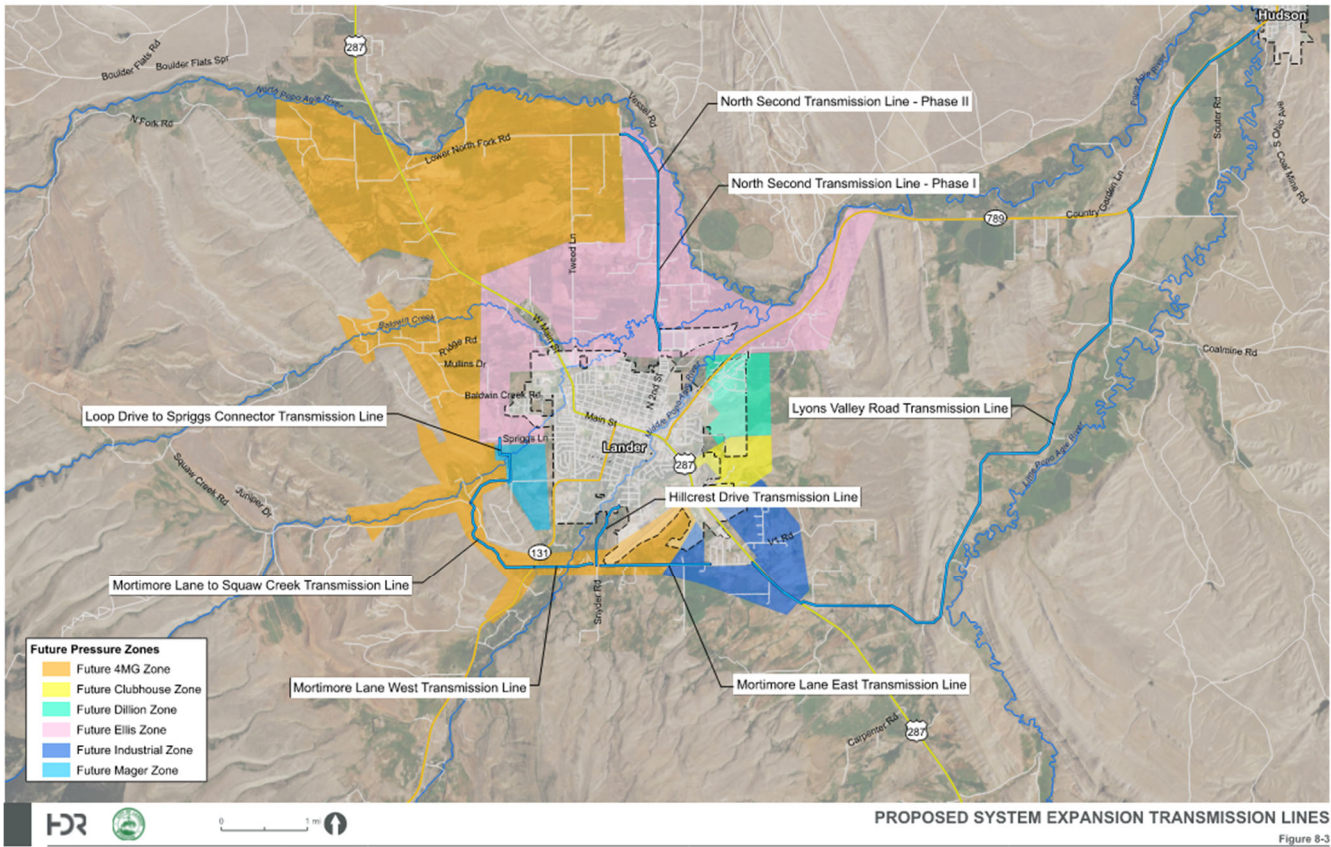
Table 8-3 Candidate Customers of Non-Potable Irrigation System

Candidate Customers – Estimated Non-Potable Irrigation Demands	acres	ADD		MDD	Estimated Annual Water Demands		
		GPM	MGD	MGD	MG/YR	AF	AF/acre
Lander Valley HS	54	150	0.216	0.54	78.9	242.1	4.52
Lander City Park	16	45	0.065	0.16	23.7	72.6	4.54
FCSD #1 & Swimming Pool	7	20	0.029	0.07	10.5	32.3	4.35
Northside Park	7	17	0.024	0.06	8.9	27.4	3.98
Pathfinder HS/Lander MS	6	16	0.023	0.06	8.4	25.8	4.35
WDOT Main Street ROW	5	12	0.018	0.04	6.5	19.9	4.35
Dillon Park	6	17	0.024	0.06	8.7	26.7	4.35
TOTALS	103	277	0.400	1.00	145.6	446.9	



2.2 System Expansion

The City identified key expansion areas surrounding the City. 2020 US Census data was examined to develop growth patterns in these areas. Topography was examined to determine the limits of expansion of existing pressure zones for expanded service. The Lander Transportation Plan was used to identify planned transportation corridors that water transmission lines could be planned concurrently with. Additionally, potential regional partners (Tribal Utility Organizations to the north and the Town of Hudson to the east) were identified such that system expansion transmission lines coincided with regional connection transmission lines. From this, eight transmission line projects were identified for the capital improvements program to expand service locally. These transmission lines are shown in Figure 8-3.



2.3 Regionalization

As part of the study performed, a survey was provided to representatives of ten community water systems within 80 miles of Lander. The following community water systems were surveyed:

- Town of Hudson
- Town of Dubois
- Redd Fox Park HOA
- Sinks Canyon Center - Alpine Institute
- City of Riverton
- Fort Washakie PWS
- Shoshoni Municipal Water System (Regional System – Joint Powers Board)
- Town Of Pavilion
- City of Lander
- Ethete Water System/Arapaho Water System/Arapaho Industrial Park System

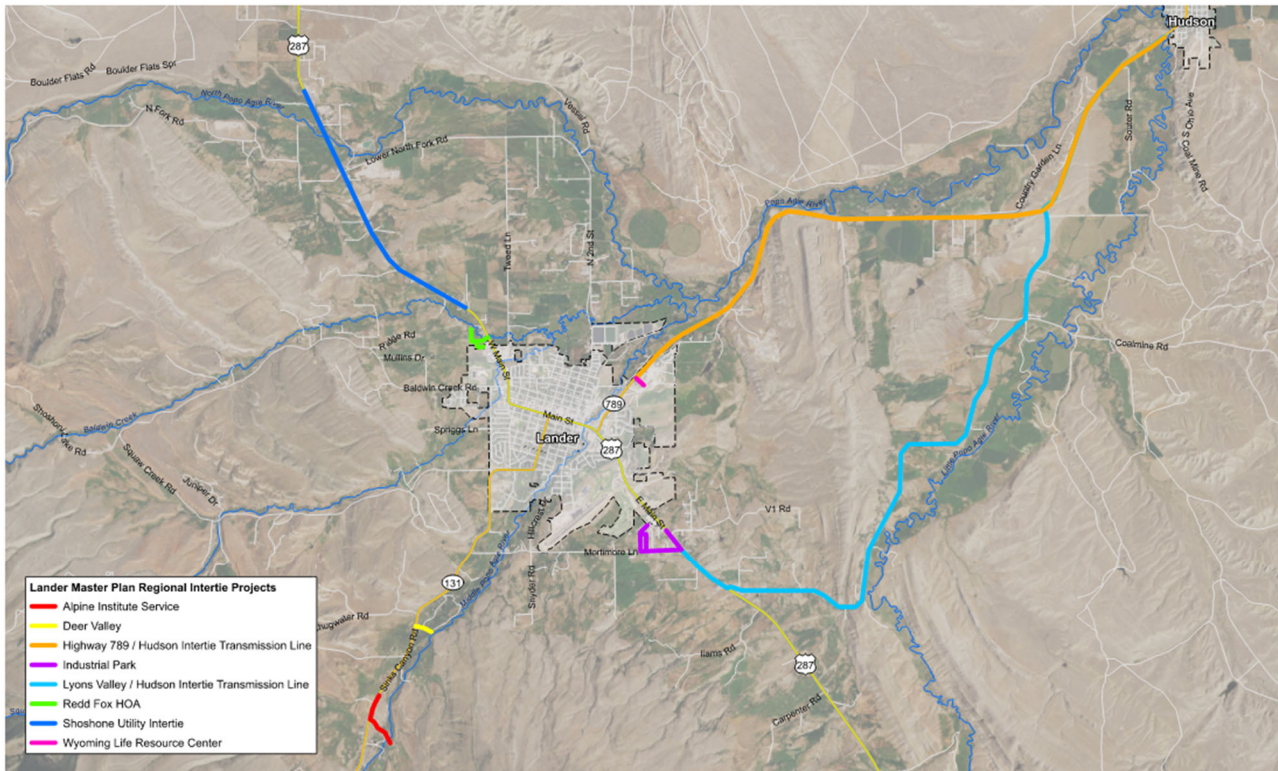


The results of the survey reflect serious concerns about many of these system’s long-term viability and indicate a strong desire to explore a regional system, as depicted in Table 9-1.

Table 9-1 Overview of Results of Regionalization Stakeholder Survey

Percentage of Survey Respondents	Answered in the affirmative to the following:
100%	Have issues hiring certified operators
60%	Have issues retaining certified operators
70%	Don't believe their system is financially viable
50%	Are concerned about providing adequate water supply to customers in the future
40%	Have ongoing water quality issues
80%	Have interest in some form of regional system
70%	Are interested in learning more about regionalized system
80%	Think there are opportunities for regional partnerships in Fremont County
90%	Are supportive of WWDO conducting a regionalization feasibility study for Fremont County

Eight near-term partner connections (Figure 9-1) were evaluated for regional service/wholesale customer potential. For the partners with existing connections, serious system improvements, reevaluation of the wholesale customer rates, and ensuring adequate metering and backflow prevention are required. Of the new system connections, it was determined that connections with Deer Valley, Lyons Valley Road to Town of Hudson Intertie, and the Shoshone Utility Organization should be pursued. A Level II Study was recommended to further investigate a regional system for Fremont County sponsored by the City of Lander.



REGIONAL PARTNER CONNECTIONS EVALUATED

Figure 9-1

LANDER, WYOMING MASTER PLAN



2.4 Reliable Service

All system elements were evaluated for reliable service. Minor recommendations were made for the water treatment plant and storage tanks; however, focus is needed on the pipelines based on number of breaks, pipe age, and material. Based on an examination of the data, roughly 40% of the pipelines in Lander either have unknown age or are at least roughly fifty years in age (if not older). Twelve priority pipeline projects were identified for inclusion in the twenty-year capital improvements plan. Table 2-2 outlines the issues associated with each of those pipes identified for replacement.

Table 2-2 Priority Pipeline Renewal Projects. Includes Both Transmission and Distribution Line Projects

Project Description	Issue(s)
Lincoln Street Transmission Line	age, failures, freezing
5th Street Transmission Line	age, failures, improperly sized
North 5th Street Pipeline	age, failures, improperly sized
McFarland Drive Pipeline	age, failures, undersized
Baldwin Creek Transmission Line	age, failures
Goodrich Connector Pipeline	age, failures, undersized
Buena Vista Drive Transmission Line	age, failures, undersized, water hammer
Grandview Valleyview Pipeline	age, failures
North 1st Street Transmission Line	age, failures
South 1st Street Pipeline	age, failures, freezing
Cascade Street Pipeline	age, failures
Mager 2 Transmission Line	age, failures

2.5 Fiscal Responsibility

An examination of the City's current rate structure, finances, and the 20-year capital improvements program costs was conducted to determine optimal financing of the capital improvements. Figure 12-1 provides a summary of the water revenue requirements.

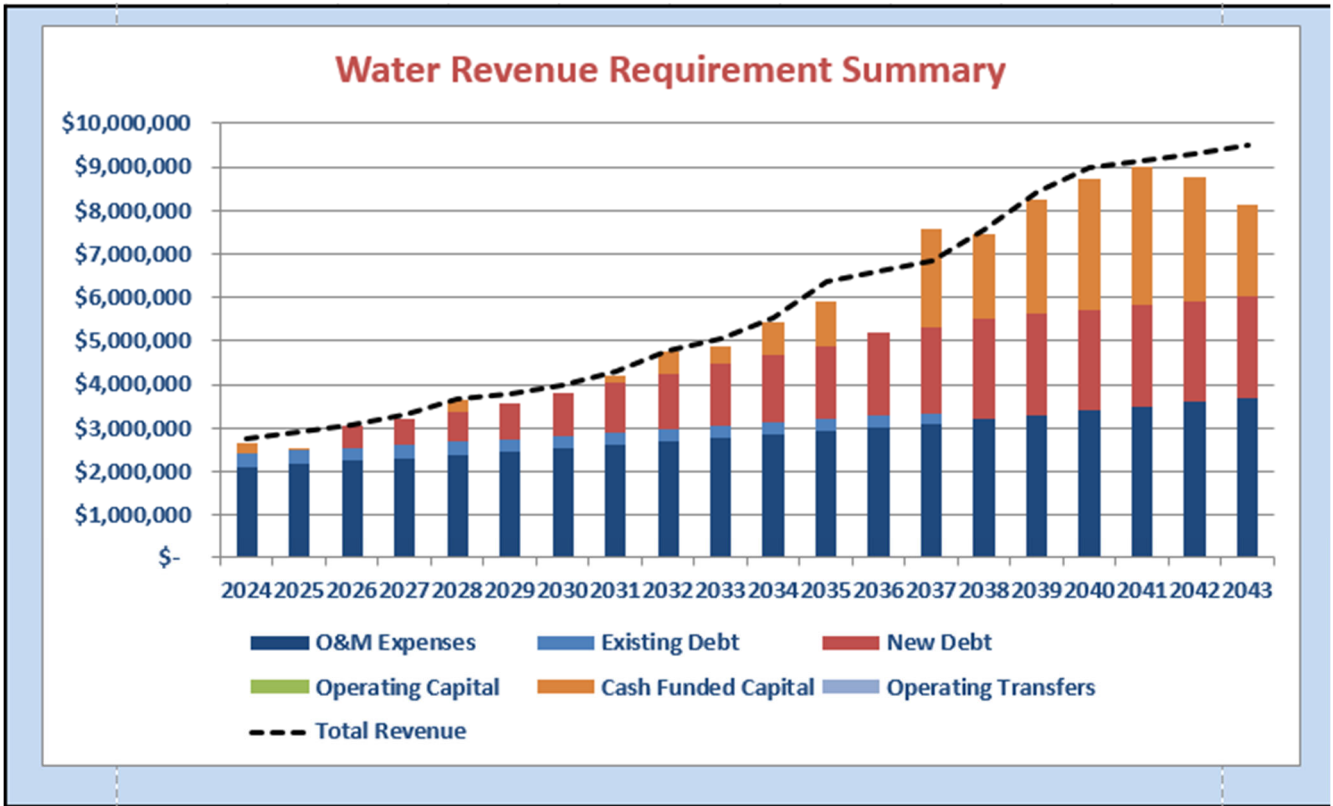


Figure 12-1 – Water Revenue Requirement Summary

3 Summary of Recommendations

The 20-year capital improvements plan for this study is a blend of projects that addresses the City’s goals of providing reliable water supply well into the future, providing a path for both local system expansion and regional partnerships, prioritizing existing system upgrades for failing elements, and enacting a financial plan that enables the accomplishment of all goals.

Recommendations stemming from this study, including costs and schedule, are summarized in Table 1-1 and shown in Figure 10-1.

Project Number	Project Name
1	City of Lander Pipeline Condition Assessment
2	Worthen Meadows Outlet Gate Rehabilitation
3	PRV Station Metering
4	Planning Water Service Map
5	Worthen Meadows Enlargement Level II Study
6	Regionalization Level II Study
7	Distribution Metering and LCR Compliance Project
8	Non-Potable Water System Level II Study
9	High Pressure Zone Tank Rehabilitation
10	Intake Structure Rehabilitation
11	Lincoln Street Transmission Line
12	Distribution System Improvements Budgeting I
13	Lander Valley HS Raw Water Conversion
14	McFarland Drive Pipeline
15	Industrial Park Bulk Fill Station
16	WTP Improvements Phase I
17	5th Street Transmission Line
18	N. 5th Street Pipeline
19	Lander City Park Raw Water Conversion
20	Hillcrest Drive Transmission Line
21	Baldwin Creek Transmission Line
22	Mortimore Lane East Transmission Line
23	Goodrich Connector Pipeline
24	Distribution System Improvements Budgeting II
25	Sewer Lagoon Bulk Fill Station
26	Buena Vista Drive Transmission Line
27	Mortimore Lane West Transmission Line
28	Industrial Park Improvements/Annexation
29	Grandview/Valleyview Pipeline
30	N. 1st Street Transmission Line
31	S. 1st Street Pipeline
32	Mortimore Lane to Squaw Creek Transmission Line
33	Cascade Street Pipeline
34	Loop Drive to Spriggs Connector Transmission Line
35	Mager 2 Transmission Line
36	Distribution System Improvements Budgeting III
37	County Shop Bulk Fill Station
38	WTP Improvements Phase II
39	Infiltration Gallery Rehabilitation
40	Exchange Petition Update for Infiltration Gallery
41	North 2nd Street Transmission Line - Phase I
42	Redd Fox Improvements/Annexation
43	North 2nd Street Transmission Line - Phase II
44	Deer Valley Expansion
45	WLRC Improvements/Annexation
46	Squaw Baldwin Tensleep and Madison Wells Level II Groundwater Study
47	Lyons Valley Transmission Line
48	Distribution System Improvements Budgeting IV

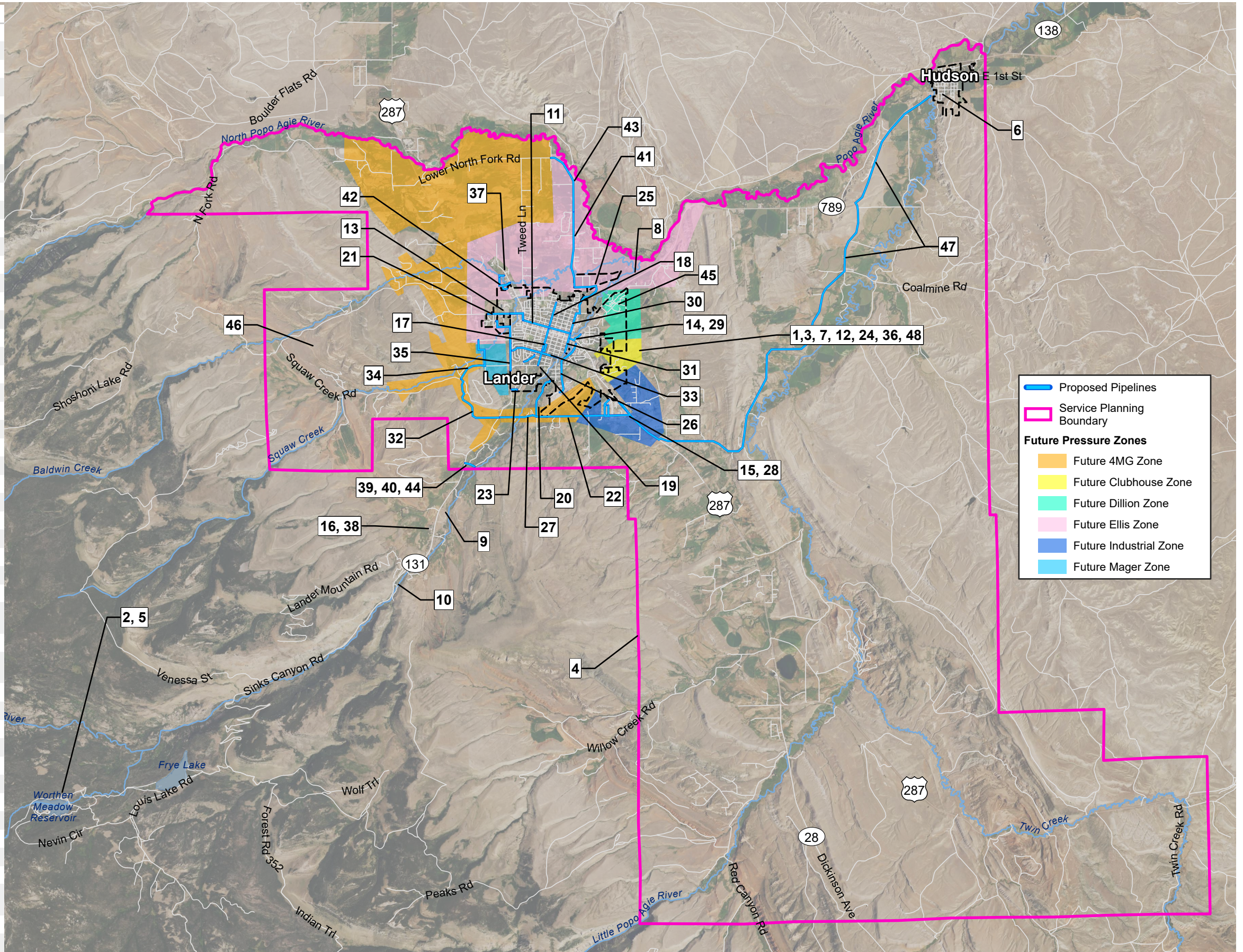




Table 3-1 - Summary of Recommendations

Project Number	Project Name	Start Year	Baseline Cost	Inflated Cost (assume 3% annually)	Funding Source
1	City of Lander Pipeline Condition Assessment	2024	\$35,000.00	\$36,050.00	cash
2	Worthen Meadows Outlet Gate Rehabilitation	2024	\$100,000.00	\$103,000.00	cash
3	PRV Station Metering	2024	\$85,000.00	\$87,550.00	cash
4	Planning Water Service Map	2025	\$20,000.00	\$21,218.00	cash
5	Worthen Meadows Enlargement Level II Study	2025	\$450,000.00	\$477,405.00	100% grant
6	Regionalization Level II Study	2025	\$650,000.00	\$689,585.00	100% grant
7	Distribution Metering and LCR Compliance Project	2026	\$5,102,001.45	\$5,575,094.74	debt
8	Non-Potable Water System Level II Study	2026	\$150,000.00	\$163,909.05	100% grant
9	High Pressure Zone Tank Rehabilitation	2026	\$1,392,300.00	\$1,521,403.80	debt
10	Intake Structure Rehabilitation	2027	\$1,000,000.00	\$1,125,508.81	67% grant, 33% debt
11	Lincoln Street Transmission Line	2027	\$2,443,225.00	\$2,749,871.26	67% grant, 33% debt
12	Distribution System Improvements Budgeting I	2028	\$1,000,000.00	\$1,159,274.07	debt
13	Lander Valley HS Raw Water Conversion	2028	\$ 734,700.00	\$851,718.66	67% grant, 33% cash
14	McFarland Drive Pipeline	2029	\$682,500.00	\$814,940.69	debt
15	Industrial Park Bulk Fill Station	2029	\$554,872.50	\$662,546.78	debt
16	WTP Improvements Phase I	2030	\$1,379,762.50	\$1,696,933.84	debt
17	5th Street Transmission Line	2030	\$2,443,350.00	\$3,005,012.31	67% grant, 33% debt
18	N. 5th Street Pipeline	2031	\$1,442,805.00	\$1,827,702.21	debt
19	Lander City Park Raw Water Conversion	2031	\$432,250.00	\$547,561.37	67% grant, 33% cash
20	Hillcrest Drive Transmission Line	2032	\$1,162,400.00	\$1,516,668.35	67% grant, 33% cash
21	Baldwin Creek Transmission Line	2032	\$1,771,090.00	\$2,310,870.74	67% grant, 33% debt
22	Mortimore Lane East Transmission Line	2033	\$5,512,150.00	\$7,407,868.67	67% grant, 33% debt
23	Goodrich Connector Pipeline	2033	\$272,625.00	\$366,385.20	cash
24	Distribution System Improvements Budgeting II	2034	\$1,000,000.00	\$1,384,233.87	debt
25	Sewer Lagoon Bulk Fill Station	2034	\$550,000.00	\$761,328.63	cash
26	Buena Vista Drive Transmission Line	2035	\$2,854,700.00	\$4,070,119.60	67% grant, 33% debt



Project Number	Project Name	Start Year	Baseline Cost	Inflated Cost (assume 3% annually)	Funding Source
27	Mortimore Lane West Transmission Line	2035	\$2,234,400.00	\$3,185,720.13	67% grant, 33% cash
28	Industrial Park Improvements/Annexation	2036	\$1,995,525.00	\$2,930,495.74	67% grant, 33% special improvements district fees
29	Grandview/Valleyview Pipeline	2036	\$2,313,675.00	\$3,397,709.74	debt
30	N. 1st Street Transmission Line	2037	\$4,586,400.00	\$6,937,341.51	67% grant, 33% cash
31	S. 1st Street Pipeline	2037	\$859,950.00	\$1,300,751.53	debt
32	Mortimore Lane to Squaw Creek Transmission Line	2038	\$3,777,650.00	\$5,885,455.61	67% grant, 33% cash
33	Cascade Street Pipeline	2038	\$3,076,027.50	\$4,792,350.62	debt
34	Loop Drive to Spriggs Connector Transmission Line	2039	\$1,749,900.00	\$2,808,075.80	67% grant, 33% cash
35	Mager 2 Transmission Line	2039	\$3,214,575.00	\$5,158,449.20	67% grant, 33% cash
36	Distribution System Improvements Budgeting III	2040	\$1,000,000.00	\$1,652,847.63	cash
37	County Shop Bulk Fill Station	2040	\$554,872.50	\$917,119.70	cash
38	WTP Improvements Phase II	2040	\$259,350.00	\$428,666.03	cash
39	Infiltration Gallery Rehabilitation	2041	\$2,000,000.00	\$3,404,866.12	67% grant, 33% cash
40	Exchange Petition Update for Infiltration Gallery	2041	\$35,000.00	\$59,585.16	cash
41	North 2nd Street Transmission Line - Phase I	2041	\$3,537,575.00	\$6,022,484.64	67% grant, 33% cash
42	Redd Fox Improvements/Annexation	2042	\$1,247,610.00	\$2,187,691.69	67% grant, 33% special improvements district fees
43	North 2nd Street Transmission Line - Phase II	2042	\$4,902,575.00	\$8,596,694.94	67% grant, 33% cash
44	Deer Valley Expansion	2043	\$100,000.00	\$180,611.12	67% grant, 33% cash
45	WLRC Improvements/Annexation	2043	\$1,030,575.00	\$1,861,333.09	67% grant, 33% special improvements district fees
46	Squaw Baldwin Tensleep and Madison Wells Level II Groundwater Study	2043	\$400,000.00	\$722,444.49	75% Grant, 25% cash or loan
47	Lyons Valley Transmission Line	2044	\$28,182,610.00	\$52,427,956.40	67% grant, 33% special improvements district fees
48	Distribution System Improvements Budgeting IV	2044	\$1,000,000.00	\$1,860,294.57	cash