

# **CITY OF WHEATLAND**

## CITY COUNCIL MEETING STAFF REPORT

December 10, 2019

SUBJECT:	Wastewater Treatment Alternatives Analysis
PREPARED BY:	Dane H. Schilling – City Engineer

#### **Recommendation**

Staff recommends the City Council receive and review the Wastewater Treatment Alternatives Analysis report, dated November 2019, and then provide any direction to staff as the City Council may deem appropriate.

#### Background/Discussion

The City's existing wastewater treatment plant was constructed in the 1960's and was designed to accommodate a population of approximately 8,000 to 10,000 residents. The plant's age, location and increasing regulatory requirements will make operating the plant and/or expanding the plant at its current location difficult and expensive. Most of the remaining capacity of the plant is committed to developers who have paid in advance to reserve sewer treatment capacity for their developments. Other developers interested in Wheatland have been highly discouraged by lack of available wastewater capacity, and the prospect of spending significant money and time to build more capacity in the City when other jurisdictions can provide immediate capacity. The lack of available wastewater capacity is the City's greatest impediment to growth as wastewater flows are projected to eventually increase to 3.82 MGD at buildout of the General Plan.

This report considers five alternative approaches to addressing the lack of wastewater treatment capacity, serving existing customers, and the relative capital costs and sewer rates associated with the two most feasible alternatives.

City Engineer Dane Schilling will be giving a brief oral presentation of the report and will be available for any questions.

#### **Attachments**

1. City of Wheatland Wastewater Treatment Alternatives Analysis, November 2019



# **Wastewater Treatment Alternatives Analysis**

Prepared for the City of Wheatland, California

December 2019



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#### **SUMMARY OF FINDINGS**

The City of Wheatland (City) commissioned this study to evaluate regional wastewater treatment and disposal alternatives available to the City. The City currently owns and operates a wastewater treatment plant (WWTP) with a plant capacity of 0.62 million gallons per day (MGD). The City is looking for treatment and disposal alternatives primarily because the current plant's capacity has placed a constraint on future City

Based on the engineering data developed in this study, conveying Wheatland's sewage to either OPUD or the LCWD are the best options for meeting City General Plan growth objectives.

development and secondarily the existing plant is aging and is overdue for major capital maintenance. Based on the engineering data developed in this study, alternatives conveying Wheatland's sewage to either Olivehurst Public Utility District (OPUD) or the Linda County Water District (LCWD) are the best options for meeting City's General Plan growth objectives. In addition, these alternatives can be accomplished in the shortest amount of time with the least impact to existing rate payers.

#### **Existing System**

Wheatland's General Plan projects City growth from the current 1,200 Equivalent Dwelling Units (EDUs) to approximately 14,000 EDUs (2006 Wheatland General Plan). The City generates wastewater flows of 0.2 MGD, based on current data. Flows are projected to increase to 3.82 MGD at buildout of the General Plan.

The City's existing WWTP has limited capacity and will be difficult to expand to meet planned City growth. Most of the remaining capacity is committed to developers who have paid in advance to reserve sewer treatment capacity for their developments. The plant was originally built in the 1960s, cannot be expanded easily, and is close to an approved residential subdivision. The infiltration basins (the disposal component of the plant) are located on the river side of the Bear River Levee and are subject to flood damage (as realized in the winter of 2005/2006). The plant provides only secondary-level treatment and due to changes in wastewater treatment requirements since the plant was constructed, the Regional Water Quality Control Board (Regional Board) will require treatment upgrades for any new permit or expansion. Maintaining the aging plant is costly, and approximately \$2.2 million (from previous City study, adjusted to current dollars) in improvements are anticipated to maintain the current operations at the plant.

#### **Evaluation of Alternatives**

This study considered the following wastewater system alternatives: connecting to OPUD, connecting to LCWD, a new City owned and operated reclamation facility, connecting to Beale Air Force Base (AFB), and connecting to the City of Lincoln (Lincoln). Due to a lack of capacity and a lack of interest in a regionalized wastewater treatment effort, Beale AFB and the Lincoln were determined to be infeasible alternatives (described further in this report). The option of a new City reclamation plant as well as connecting to OPUD or LCWD is described below.

#### **New City Reclamation Facility**

In 2007 the City evaluated constructing a water reclamation facility for the buildout of the General Plan on the western side of the expanded City limits (also known as the Dairy Road Site). The new reclamation facility ("plant") would provide tertiary level treatment so that the water could be used for irrigation. The plant was envisioned to include a new headworks, oxidation ditches with aerobic and anoxic zones, secondary clarifiers, flocculation basins, tertiary filters, UV channels or chlorine contact basins for disinfection, mechanical biosolids dewatering, and emergency and seasonal storage. Under this effort the build-out capacity was estimated at 10 million gallons (MG) at a cost of \$120 million. Subsequently, FEMA issued updated flood mapping for the Wheatland area which showed the Dairy Road Site in the 100-year flood hazard area, therefore the Dairy Road Site is only viable if a levee is constructed immediately surrounding the site (adding further cost and increasing the land required for this alternative).

Based on this prior experience, an alternative for a new City-owned WWTP would involve building a 3.8 MGD plant (ultimate capacity) in phases that match the growth rate of the City. A minimum logical first phase onsite project would have capacity of about 0.6 MGD, which would serve about 2,400 EDUs (that 2,400 EDUS could consist of existing users and future growth, or entirely future growth and the existing users remain at the current plant). Based on recent WWTP bids, that first phase project is estimated to cost about \$36 million. Subsequent expansions to 3.8 MGD would cost an additional \$49 million, for a total project cost of \$85 million at General Plan buildout.

#### **Connect to Olivehurst Public Utility District (OPUD)**

Connecting Wheatland to either OPUD or LCWD are both technically feasible and in concert with Regional Board policy of consolidating smaller plants into larger ones. OPUD is in the process of expanding their service area towards Wheatland along the Highway 65 Corridor, making it more convenient for Wheatland to tie in. If this alternative is selected, OPUD would need to account for expected flows from Wheatland in their sewer system master plan and when sizing pipes. OPUD has a tertiary WWTP that has capacity to handle initial flows from Wheatland. Approximately 1.5 MGD (5,500 EDUS) is available at OPUD's plant with minor plant improvements. OPUD's plant has the space to eventually expand to 8 MGD and could eventually handle all of Wheatland's project flows at General Plan buildout.

Up-front conveyance infrastructure costs for pumping and piping are estimated to be \$10 million for connecting to OPUD. The City would also need to purchase capacity in the OPUD system's trunk sewers and WWTP. Connection fees for the OPUD system are reported to be about \$10,000/EDU. As an example, the City's existing 1,200 EDUs would be charged on the order of \$12 million for buying into OPUD's system.

#### **Connect to Linda County Water District**

Connecting to LCWD would require longer pipelines to reach the existing LCWD service area when compared to the OPUD alternative. LCWD has a tertiary WWTP that have capacity to handle initial flows from Wheatland. Approximately 1.5 MGD (about 5,500 EDUs) is available at

LCWD's plant with minor plant improvements. LCWD's plant has the space to eventually expand to 15 MGD and could eventually handle all of Wheatland's projected flows at General Plan buildout.

Up-front conveyance infrastructure costs for pumping and piping are estimated to be \$18 million for connecting to LCWD. The higher cost to connect to LCWD compared to OPUD is due to the need for longer pipelines to reach the LCWD connection point. The City would also need to purchase capacity in the LCWD system's trunk sewers and WWTP. Connection fees are reported to be about \$9,500/EDU.

#### Phasing of Connections to OPUD or LCWD

Phasing of regional facilities is important because the initial up-front conveyance costs are significant compared to the existing rate base needed to finance it. In this situation, it appears that 1.5 MGD (5,500 EDUs) capacity is a reasonable first phase because: 1) OPUD and LCWD have this capacity available (described above); 2) 5,500 EDUs would provide enough capacity for more than triple the current City population; and 3) pipes can be optimally sized to not settle debris during low flow conditions and not create excessive pipeline friction during future peak flows. In future phases the City could expand those facilities by constructing additional pipelines and pump stations to either OPUD and/or LCWD.

#### **Recommended Course of Action**

Based on the detailed information contained in this report, the options of connecting the City of Wheatland to either OPUD or LCWD are the best apparent alternatives. Connecting to either agency is technically feasible, have lower upfront costs by as much as \$14 million, have lower operating costs, and are in concert with Regional Water Board policy of consolidating smaller plants into larger ones. The cost differential between the two agencies is close enough to warrant the next step of negotiating with OPUD and LCWD regarding proposed connection fees and monthly rates.

Connecting Wheatland's existing customers to OPUD is estimated at \$10 million in new conveyance facilities plus \$12 million in connection fees for existing system capacity that OPUD has built or will be building along the Highway 65 Corridor. Connecting Wheatland's existing customers to LCWD is estimated at \$18 million for new conveyance facilities plus \$10 million in connection fees for existing system capacity.

Wheatland can fund improvements with a combination of:

- Low interest loans by the state: If rates are unchanged, the savings in O&M costs can be used to finance low interest loans with the state. Conservatively, it appears about \$10/month / EDU of rate savings could be applied to finance regional infrastructure. At 1,200 EDUs, that \$10/month savings would finance about \$2.5 million in capital assuming a 2% interest rate and 30-year loan with the State.
- <u>Developer Contributions</u>: The City has collected approximately \$4 million from developers that could be used to fund plant expansion or regional infrastructure. It is likely these contributions would need to increase to fund development's share of the regional project.

<u>Subsidies from the State or Yuba Water Agency</u>: The State has a policy to encourage regionalization by offering "Principal Forgiveness" on up to 50% of loan amount (maximum grants of \$4 million are allowed). For instance, the City would be eligible for a match of \$2.5 million on the low interest loan described above. Yuba Water Agency may also have programs to help fund infrastructure if a regional economic or environmental benefit can be demonstrated.

This report provides some of the needed technical information (capacity needs, pipe sizing and alignments, costs, etc.) for an eventual agreement with OPUD or LCWD. Many agencies have formed Joint Powers Authorities (JPAs) for regional conveyance projects which can help utilize grant funds and provide transparency in how the system is managed. Understanding project financing options, governance structures, and needed agreements are logical next steps in developing the City's long-term wastewater plan.

## Section 1

#### **INTRODUCTION AND BACKGROUND**

#### 1.1 Introduction

Over the last 15 years, the City of Wheatland (City) and several nearby agencies (Olivehurst Public Utility District (OPUD), Linda County Water District (LCWD), Beale Air Force Base (Beale AFB), and the City of Lincoln) have participated in a number of efforts exploring options for a regional wastewater conveyance, treatment, and disposal/reuse system for South Yuba County.

Previous studies include the *South Yuba County Regional Wastewater Treatment Feasibility Study* (2010, Kennedy/Jenks Consultants) and a study by Beale Air Force Base (AFB) in 2012 that engaged the nearby agencies to determine the feasibility of sending AFB wastewater to them. Past efforts have had difficulty obtaining consensus because:

- Each agency has been on different growth and regulatory timelines
- The up-front costs for planning, design, and construction can be significant
- Financial participation is difficult to secure without coordinated participation

Recently OPUD has renewed their interest in creating a regional solution to serve growth areas in southern Yuba County. OPUD is in the process of expanding their service area towards Wheatland and would like to accommodate Wheatland's flows, depending on the City's interest and needs.

The purpose of this feasibility study (Study) is to:

- Provide an understanding of existing flows and anticipated future growth in the City
- Evaluate the capacity of other agencies to accept and treat the City's wastewater
- Evaluate viable regionalization alternatives for the City's wastewater
- Provide a logical phasing plan to minimize upfront conveyance costs
- Provide an estimate of costs and rates associated with the evaluated alternatives

#### **1.2** Summary of Nearby Agencies

The following sections provide background information for each respective agency, including existing conditions, anticipated long term improvement/expansion requirements, and agency interests and concerns. A summary of each agency's wastewater capacity and sewer rates and fees is provided in Appendix A at the end of this Study.

#### 1.2.1 City of Wheatland

#### **Existing Capacity**

The City's WWTP, originally constructed in 1969, has an existing capacity of 0.62 MGD. Over the past five years, the 30-day average flow has been approximately 0.2 MGD with un-disinfected secondary effluent discharged to infiltration basins adjacent to the Bear River. The existing plant was built in the 1960's and is need of major capital replacement and upgrades in order to continue to meet current and future regulations.

#### **Future Growth**

The City is planning for a significant amount of future growth, which is outlined in their General Plan. At build-out, the General Plan anticipates a total of 14,057 equivalent dwelling units (EDUs), which will require 3.82 MGD of wastewater treatment capacity (CH2MHill 2007). An EDU is a unit of measure that standardizes all land use types (housing, retail, office, etc.) to the level of demand created by one single family housing unit. For example, one EDU is equivalent to the amount of water use (gallons per day) or wastewater generation (gallons per day) of an average single-family detached household. A small business designed to use three times as much water as an average single-family detached dwelling would have a wastewater discharge of three EDUs in terms of a wastewater facility.

The WWTP has the capacity to treat 1,200 EDUs beyond the current service level of 1,200 EDUs for a total of 2,400 EDUs. Most of the additional 1,200 EDUs of capacity have already been committed to developers who have paid to reserve capacity.

#### WWTP Expansion

The City's WWTP can be expanded to about 1 MGD (4,600 EDUs), but expansion of the site has some challenges:

- The plant provides secondary-level treatment and discharge into percolation basins. While this level of treatment was considered appropriate when the permit was originally adopted, the Regional Water Quality Control Board will require treatment upgrades for any new permit and expansion. LCWD has a similar discharge condition and requires tertiary-level treatment.
- Relocation of percolation basins from the river side of the Bear River Levee to the protected side of the levee will be required. The City has identified land adjacent to the plant that is part of the Heritage Oaks Estates developments designated for a park as a potential site for new percolation basins.
- In the early 2000s, the City explored building a new 10 MGD tertiary WWTP on its western boundary. The up-front planning, design, and construction costs were significant at \$120 million. The City and developers lost interest due to the high initial cost.
- Parts of the plant are 50 years old and will require continued rehabilitation and investment as it ages. The April 2011 Wastewater Treatment Reliability Study described reliability improvements of about \$1.8 million (in 2011 dollars).
- The plant is near residential areas.

Because of these challenges, the City is looking into its regional options, which are explored in this Study.

## **1.2.2** Linda County Water District

#### **Existing Capacity**

LCWD completed an expansion of their existing tertiary level WWTP in 2011, bringing their current capacity to 5.0 MGD (18,399 EDUs). However, minor upgrades to the chlorine contact basin are required before it can be rated for 5 MGD.

In November of 2018, the City of Marysville connected its wastewater system to the LCWD system. Marysville purchased 1.8 MGD of capacity for existing residents and its expected near-term growth. The pertinent aspects of Marysville's connection include:

- In 2012 Marysville entered into a \$13.2 million bond issuance to fund the construction of regional sewers and their share of the LCWD plant upgrade. The annual debt service is about \$781,000 per year.
- Marysville pays LCWD their proportionate share of plant operating costs, currently about \$840,000 per year.
- Marysville pays LCWD their share of capital projects, currently about \$25,000 per year.

Marysville has about 5,350 EDUs, so the regional sewer construction and purchase of capacity in LCWD represented about \$12 per month per EDU (\$781,000/ 5,350/ 12 months). O&M costs are generally lower by connecting into a larger WWTP, so Marysville's residents likely experienced a smaller rate impact.

#### **Future Growth**

LCWD adds about 80-100 EDU/year and has approximately 1.5 MGD in available treatment capacity.

#### Feasibility

The WWTP construction for the existing site has been laid out for expansion of up to 15 MGD (55,198 EDUs). LCWD is interested in providing regional wastewater treatment in South Yuba County and has recent, relevant experience in doing just that with the city of Marysville. Therefore, connecting to LCWD is also a feasible option for the City and is explored in more detail in this Study.

#### **1.2.3** Olivehurst Public Utility District

#### **Existing Capacity**

OPUD has an existing permitted capacity of 3.0 MGD (11,040 EDUs) at their tertiary level WWTP. OPUD is currently using half of their capacity with an average flow rate of 1.5 MGD (5,520 EDUs) which is presenting operational challenges due to lower flows.

#### **Future Growth**

Planned construction at the WWTP will add an additional 5,520 EDUs (1.5 MGD) of treatment capacity bringing the total capacity to 16,559 EDUs (4.5 MGD). The existing site is suitable for expansion of up to 29,439 EDUs (8 MGD).

OPUD plans to serve the Highway 65 Corridor commercial and industrial area in south Yuba County, including the Entertainment Zone (currently the amphitheater and Hard Rock casino), in the coming years as well as continued expansion of the Plumas Lake Specific Plan. The Highway 65 Corridor is close to the City of Wheatland. OPUD is conducting engineering studies to lay out and size the sewers for this area. OPUD plans include annexation of an area to the east and south of their current service area that reaches as far south as South Beale Road (see Figure 1). OPUD will need to know within the next 6 months to what extent if any Wheatland should be included.

#### Feasibility

Connecting to OPUD is a feasible alternative for the City because it is close, has capacity, and is open to a regional option. Therefore, connecting to OPUD is explored in more detail in this study.

## 1.2.4 Beale Air Force Base (AFB)

In April 2009, Beale Community Partners (BCP) was a private group comprised of more than 25 local and national companies that had been awarded a contract for a series of projects to convert 334 acres on Beale AFB into privately leased properties. The project also included plans for a new wastewater treatment facility to serve Beale AFB, with plans to expand to up to 20 MGD in the future and potentially serve the region beyond the AFB. However, the BCP dissolved in November 2009 without having completed the projects and a new WWTP was not built.

Beale AFB has since expanded and upgraded its WWTP to include activated sludge biological treatment and UV disinfection. This expansion and upgrade project is expected to serve the Beale AFB for the foreseeable future.

As a result, the Beale AFB is no longer interested in a regional program, and is therefore not a feasible alternative for the City.

## 1.2.5 City of Lincoln

#### **Existing Capacity**

The City of Lincoln participated in the Midwestern Placer Regional Sewer Project which consolidated wastewater treatment from the City of Lincoln and Placer County's SMD-1 service areas as encouraged by adopted policies of the Central Valley Regional Water Quality Control Board (CV-RWQCB). The City of Lincoln has a fully compliant Wastewater Treatment and Reclamation Facility (WWTRF) that came online in 2004 and is designed to be readily expandable for treatment capacity to service the City of Lincoln's General Plan and the General Plan for Placer County's SMD-1 service area. The City of Lincoln's WWTRF is designed to produce disinfected tertiary water that complies with both the surface water discharge regulations to Auburn Ravine Creek as well as with the requirements of Title 22 of the California Code of Regulations for unrestricted reuse.

#### **Future Growth**

The City of Lincoln has recently completed the design of a plant expansion to increase capacity from 5.9 MGD to 8.0 MGD. That capacity has been allocated and financed by developers in Placer County and within the City of Lincoln.

## Feasibility

Wheatland would need to fund a subsequent expansion of the Lincoln WWTP and is therefore is less desirable compared to OPUD and LCWD, who have readily available capacity. Connection to Lincoln also requires the construction of longer pipelines (14 miles) and additional pump stations compared to the OPUD and LCWD options.

### 1.3 Project Phasing

As shown in Figure 1, projected wastewater totals generated in South Yuba County are estimated to be approximately 15 MGD. LCWD and OPUD and possibly Wheatland would need to expand their facilities in phases to meet these demands. Based on discussions with OPUD and LCWD, each plant could accommodate on the order of 5,500 EDUs (1.5 MGD) from Wheatland prior to a plant expansion.

Phasing is an important aspect of this program because the initial up-front conveyance costs are significant compared to the existing rate base needed to help finance it. It appears 1.5 MGD (5,500 EDUs) capacity is a reasonable first phase because: 1) there exists available WWTP capacity in OPUD or LCWD (described above); 2) 5,500 EDUs would provide more than triple the current City population; and 3) pipes can be sized to not settle debris during low flow conditions and not create excessive pipeline friction during future peak flows.



WHEATLAND	AVG	PEAK	PEAK LCWD WWTP		PEAK
CURRENT FLOWS:	0.2 MGD	0.6	CURRENT FLOWS:	2.5 MGD	
FUTURE FLOWS:	3.82 MGD	0.5	FUTURE FLOWS:	5 MGD	
			EXPANSION CAPACITY:	15 MGD	
HIGHWAY 65 CORRIDOR	AVG	PFAK	PLUMASLAKE	AVG	PEAK
FUTURE FLOWS:	1.2 MGD		CURRENT FLOWS:	0.76 MGD	
			FUTURE FLOWS:	4 MGD	
	AVG	DEAK			DEAK
		FEAR			FEAR
DI ANT CADACITY:				1.2 MGD	
	3 MGD		FUTURE FLOWS:	1.2 WGD	
EXPANSION CAPACITY:	8 MGD				

## Figure 1

## South Yuba County Flow Projections

## Section 2

#### **EVALUATION OF ALTERNATIVES**

Three initial alternatives have been developed from the information presented in the previous section. These alternatives are discussed in more detail in the following sections and a table summarizing these alternatives is included in Appendix A. The alternatives:

- 1) The City builds a new WWTP
- 2) The City conveys its wastewater to LCWD
- 3) The City conveys its wastewater to OPUD

#### 2.1 Alternative 1 – New WWTP

In 2007 the City evaluated constructing a water reclamation facility for the buildout of the General Plan on the western side of the expanded city limits (also known as the Dairy Road Site). The plant would provide tertiary level treatment so that the water could be used for irrigation. The plant was envisioned to include a new headworks, oxidation ditches with aerobic and anoxic zones, secondary clarifiers, flocculation basins, tertiary filters, UV channels or chlorine contact basins for disinfection, mechanical biosolids dewatering, and emergency and seasonal storage. Under this effort the build-out capacity was estimated at 10MG at a cost of \$120M. Subsequently, FEMA issued updated flood mapping for the Wheatland area which showed the Dairy Road site in the 100-yr flood hazard area, therefore the Dairy road site is only viable if a levee is constructed immediately surrounding the site (adding further cost and land required for this alternative).

While constructing a new WWTP would accommodate future growth, a new tertiary level WWTP would involve permitting, planning and design, the purchase of land for the new WWTP site and for land disposal, and construction. Based on this prior experience, an alternative for a new City-owned WWTP, would involve building a 4 MGD plant (ultimate capacity) in phases that match the growth rate of the City. A minimum logical first phase onsite project would have capacity of about 0.6 MGD, which would serve about 2,400 EDUs (that 2,400 EDUS could consist of existing users and future growth, or entirely future growth and the existing users remain at the current plant). Based on recent WWTP bids, that first phase project is estimated to cost about \$36 million. Subsequent expansions to 4 MGD would cost an additional \$49 million, for a total project cost of \$85 million at General Plan buildout. A new tertiary WWTP would have significantly higher O&M costs than the City's secondary plant.

#### 2.2 Alternative 2– Wheatland Conveys Wastewater to LCWD

Based on communications with LCWD, the best location to connect Wheatland's flows would be into one of their trunk sewers at the corner of Griffith Ave. and Erle Rd. New conveyance facilities include upgrades to the Malone Lift Station, construction of two new regional pump stations, and 8 and 12-inch diameter force mains to LCWD for the initial phase. Additional pumping and piping would be constructed in subsequent phases. The pipeline routes and service areas are shown in Figure 2.

The estimated cost of Phase 1 conveyance facilities into LCWD is provided in Table 1 below.

Pipeline Construction Cost								
			Ma	terials	In	stallation		
Description	QTY	Units	\$/Unit	Total	\$/Unit	Total		Total
8-Inch Diameter Pipe, C900	8976	LF	25	\$ 224,400	55	\$ 493,680	\$	700,000
12-Inch Diameter Pipe, C900	55968	LF	50	\$ 2,798,400	90	\$ 5,037,120	\$	8,000,000
Subtotal Pipeline Cost							\$	8,700,000
	Pump S	Station Cons	truction Co	ost				
Rehabilitation of Malone Pump Station							\$	600,000
New Pump Stations	2						\$	1,800,000
Subtotal Conveyance Construction Co							\$	11,000,000
	Contingency & Contractor Overhead (40%) \$ 4,400,00			4,400,000				
Non-Construction Costs (Engineering, Admin, Regulatory) (20%)			\$	2,200,000				
Subtotal Capital Cost			\$	18,000,000				

Table 1Initial Phase Conveyance to LCWD Service Area

The upfront capital costs for Phase 1 piping and pumps displayed in Table 1 do not include the connection cost to buy into LCWD's WWTP and sewer system, reported at approximately \$9,500/EDU. With Wheatland's 1,200 EDUs, the connection fees to LCWD would be on the order of \$10 million.

As part of the Memo of Understanding between LCWD and City of Marysville, an agreement was reached such that LCWD charges Marysville the share of the O&M costs proportional to the average flow entering LCWD WWTP from Marysville. That O&M charge is currently about \$14/ month/ EDU. A similar O&M rate may be possible with Wheatland's connection. The total monthly rate would represent LCWDs rate (potentially \$14) plus O&M on the regional pipelines

and City sewers, existing debt service, any new debt service, and City administration costs. A possible scenario to connect into LCWD would involve the following phasing through General

Description	Capacity	Incremental Cost	Cumulative Cost	Funded By
Phase 1			I	I
Construction of 2 pump stations, 1.7 miles of 8 inch and 10.6 miles of 12 inch pipelines. Connection to LCWD at corner of Griffith Ave. and Erle Rd.	5,500 EDUs (1,200 existing plus 4,300 new). Initial capacity of 1.5 MGD average, 4.5 MGD peak	\$18 million	Total Phase 1 up to \$70 million	Future Development
Purchase existing 1,200 EDUs in LCWD.		Possibly a negotiated cost with LCWD reflecting the fact that these EDUs are essential re- purchasing capacity through sewer rates or other subsidies. Costs about \$10 million or less.		Existing Rate Payers/Future Development
Purchase of up to 4,300 additional new EDUs of capacity in LCWD for City growth		Number of EDUs TBD based on City development plans. Likely about \$43 million (\$9,500 per EDU).		Future Development
Phase 2*				
Construct additional pumping	Provides an additional sewer capacity of 1,500 EDUs (7,000 EDUs total)	\$1.2 million	Up to \$71 million*	Future Development
Phase 3*				
Construct additional pumping and piping. Convey flows to OPUD and / or LCWD	Provides sewer capacity for the remaining City growth (14,000 EDUs total)	\$10.2 million capital cost of pipeline	Up to \$81 million*	Future Development

\*Only includes construction costs for Phase 2 and 3; does not include cost of purchasing additional capacity at LCWD for Phase 2 and Phase 3 EDUs (likely an additional \$9,500/EDU)

Plan buildout (14,000 EDUs total).

As described above, the initial costs to construct conveyance facilities and buy-into the LCWD system is estimated at \$28 million. If these initial costs were financed though loans on existing residents and repaid with sewer fees, the rate impacts would be significant. The table below shows the general breakdown of the existing sewer rate structure and how that rate could change in the future. As shown, the O&M efficiencies with going to a larger WWTP may represent

	Current Monthly Rate per EDU		Future Monthly Rate per EDU
Operating Expenses			
Existing Debt	\$10		\$10
City Collection System O&M	\$10		\$10
WWTP O&M	\$35		
City Administration	\$10		\$10
LCWD Monthly Charge			\$20
Current Rate	\$65	Future Rate	\$50
Project Expenses*			
Debt Service for Connection Cost for Existing Customers (\$10 mil) Debt Service for Phase 1 Conveyance Capital Costs (\$18 mil)			\$40** \$55**
Current Rate		Future Rate	\$95
Total Current Rate	\$65	Total Future Rate	\$145

\*Does not include the use of approx. \$4 mil in current reserves to finance part of project expenses \*\* Rate increase needed to finance the cost of the project with a 2% State Revolving Loan with a 30-year term

about \$10-15/ month savings to the City. However, Wheatland's sewer rates would need to more than double if rates are used to finance all of the initial conveyance and buy-in to the LCWD system. Other funding sources will be needed to make this option equitable and affordable to existing residents.



Figure 2

#### Proposed Conveyance System to LCWD

#### 2.3 Alternative 3 – Wheatland Conveys Wastewater to OPUD

OPUD is in the process of annexing the "Highway 65 Corridor" area into its service area and is conducting engineering studies to size the sewers for this area. This annexation of the Highway 65 Corridor will bring the OPUD Service Area within a few miles of Wheatland's City Limits.

Based on communications with OPUD, Wheatland would need to convey wastewater to the corner of South Beale Rd and HW 65. New conveyance facilities include upgrades to the Malone Lift Station, construction of one new regional pump station, and 8- and 12-inch diameter forcemains to OPUD. Additional pumping and piping would be constructed in subsequent phases. The pipeline routes and service areas are shown in Figure 3.

The estimated cost of Phase 1 conveyance facilities to OPUD is provided in Table 2.

Pipeline Construction Cost								
			Ma	terials	In	stallation		
Description	QTY	Units	\$/Unit	Total	\$/Unit	Total		Total
8-Inch Diameter Pipe, C900	8976	LF	25	\$ 224,400	55	\$ 493,680	\$	700,000
12-Inch Diameter Pipe, C900	29040	LF	50	\$ 1,452,000	90	\$ 2,613,600	\$	4,000,000
Subtotal Pipeline Cost							\$	4,700,000
	Pump S	Station Cons	truction Co	ost				
Rehabilitation of Malone Pump Station							\$	600,000
New Pump Station On Spenceville Rd							\$	900,000
Subtotal Conveyance Construction Co \$ 6,00					6,000,000			
			Contin	gency & Contr	actor O	verhead (40%)	\$	2,400,000
	Non-Construction Costs (Engineering, Admin, Regulatory) (20%)			\$	1,200,000			
Subtotal Capital Cost			\$	10,000,000				

# Table 2Initial Phase Conveyance System to OPUD Service Area

The upfront capital costs for Phase 1 pipes and pumps displayed in Table 2 do not include the connection cost to buy into OPUD's WWTP and sewer system, reported at approximately \$10,000/EDU. With approximately 1200 EDUs currently in Wheatland, the connection cost to OPUD would be approximately \$11.4 mil.

OPUD has reported the City of Wheatland would be charged its current monthly charge of \$40/EDU/ month. As with the LCWD alternative, the total rate for Wheatland would be a combination of OPUD's rate, existing and new debt service, City O&M and administration.

A possible scenario to connect into OPUD would involve the following phases through buildout of the General Plan.

Description	Capacity	Incremental Cost	Cumulative Cost	Funded By
Phase 1				
Construction of 1 new pump station, 1.7 miles of 8 inch and 5.5 miles of 12 inch pipelines. Connection to OPUD South Beale Rd.	5,500 EDUs (1,200 existing plus 4,300 new). Initial capacity of 1 MGD average, 4.5 MGD peak	\$10 million	Total Phase 1 up to \$65 million	Future Development
Purchase existing 1,200 EDUs in OPUD.		Possibly a negotiated cost with OPUD reflecting the fact that these EDUs are essential re- purchasing capacity through sewer rates or other subsidies. Costs about \$12 million or less.		Existing Rate Payers/Future Development
Purchase of up to 4,300 additional new EDUs of capacity in OPUD for City growth		Number of EDUs TBD based on City development plans. Likely about \$10,000 per EDU.		Future Development
Phase 2*		-		
Construct additional pumping	Provides an additional sewer capacity of 1,500 EDUs (7,000 EDUs total)	\$1.2 million	Up to \$66 million*	Future Development
Phase 3*				
Construct additional pumping and piping. Convey flows to OPUD and / or LCWD	Provides sewer capacity for the remaining City growth (14 000 FDUs total)	\$10.2 million capital cost of pipeline	Up to \$76 million*	Future Development

\*Only includes construction costs for Phase 2 and 3; does not include cost of purchasing additional capacity at OPUD for Phase 2 and Phase 3 EDUs (likely an additional \$10,000/EDU)

The initial costs to construct conveyance facilities and buy-into the OPUD system is estimated at \$22 million. Similar to LCWD Option, if these initial costs were financed though loans on existing residents and repaid with sewer fees, the rate impacts would be significant. The table below shows the general breakdown of the existing sewer rate structure and how that rate could change in the future. As shown, Wheatland's sewer rates would need to more than double if rates are used to finance all of the initial conveyance and buy-in to the OPUD system. Other funding sources will be needed to make this option equitable and affordable to existing residents

	Current Monthly Rate per EDU		Future Monthly Rate per EDU
Operating Expenses			
Existing Debt	\$10		\$10
City Collection System O&M	\$10		\$10
WWTP O&M	\$35		
City Administration	\$10		\$10
OPUD Monthly Charge			\$30-40
Current Rate	\$65	Future Rate	\$60-70
Project Expenses*			
Debt Service for Connection Cost for Existing Customers (\$12 mil) Debt Service for Phase 1 Conveyance Capital Costs (\$10 mil)			\$45** \$40**
Current Rate		Future Rate	\$85
Total Current Rate	\$65	Total Future Rate	\$145-155

\*Does not include the use of approx. \$4 mil in current reserves to finance part of project expenses

\*\* Rate increase needed to finance the cost of the project with a 2% State Revolving Loan with a 30-year term



Figure 3

## Proposed Conveyance System to OPUD

## **Section 3**

### **FINANCING OPTIONS**

Connecting Wheatland's existing customers to OPUD is estimated at \$10 million construction for conveyance plus \$12 million in connection fees for existing system capacity that OPUD has built or will be building along the Highway 65 Corridor. Connecting Wheatland's existing customers to LCWD is estimated at \$18 million construction for conveyance plus \$10 million in connection fees for existing system capacity.

As shown in previous sections, if rates alone were to fund construction for conveyance and connection fees, current rates would need to increase by \$80-90. However, there are other funding sources that could alleviate the impact on current rate payers.

Wheatland can fund improvements with a combination of:

- Low interest loans by the state: If rates are unchanged, the savings in O&M costs can be used to finance low interest loans with the state. Conservatively, it appears about \$10/month / EDU of rate savings could be applied to finance regional infrastructure. At 1,200 EDUs, that \$10/month savings would finance about \$2.5 million in capital assuming a 2% interest rate and 30-year loan with the State.
- <u>Developer Contributions</u>: The City has collected approximately \$4 million from developers that could be used to fund plant expansion or regional infrastructure. It is likely these contributions would need to increase to fund developments' share of the regional project.
- <u>Subsidies from the State or Yuba Water Agency:</u> The State has a policy to encourage regionalization by offering "Principal Forgiveness" on up to 50% of loan amount (maximum grants of \$4 million are allowed). For instance, the City would be eligible for a match of \$2.5 million on the low interest loan described above. Yuba Water Agency may also have programs to help fund infrastructure if a regional economic or environmental benefit can be demonstrated.

The best combination of funding sources is beyond the scope of this study and requires input from staff, City Council, and other stakeholders to ensure there is a nexus between who pays and the benefit received. It is important to note that use of sewer rates exclusively to finance debt on capital projects and the purchase of capacity is difficult for smaller rate bases like Wheatland. In general terms, the City could finance about \$2.5 million in capital for every \$10/EDU/month of sewer rate assuming a 30 year 2% interest loan with the State. Wheatland's sewer rates would need to about double if rates are used to finance all of the initial conveyance and buy-in to the OPUD system.

For reference, Table 3 displays the residential sewer rates for several nearby cities and agencies.

City/Agency	<b>Residential Sewer Rate</b>
Wheatland	\$65.00
Davis	\$50.37
Yuba City	\$49.04
Colusa	\$88.00
Live Oak	\$78.00
Olivehurst PUD	\$40.00
Marysville	\$49.00 (proposed 2020)
Linda County Water District	\$36.80

Table 3 Residential Sewer Rate Comparison

Appendix A
Alternative Evaluation Matrix

ltem	OPUD	LCWD	Wheatland	New Wheatla nd WWTP	Lincoln (a)	Beale AFB (a)
<b>Existing Conditions</b>						
Description of Utility	Tertiary with Direct Discharge into Feather River	Tertiary with Percolation into Feather River	Secondary WWTP with Percolation adjacent to Bear River	Tertiary with Land Applica tion	Tertiary WWTP Ag and Direct Discharge into Auburn Ravine	Secondary WWTP and Land Application
Plant Capacity	3 mgd	5 mgd	0.6 mgd	4 mgd	5.9 mgd	1.2 mgd
Permitted Capacity	3 mgd	6.7 mgd	0.6 mgd		5.9 mgd	5.2 mgd
Current Flows	1.5 mgd	3.2 mgd	0.2 mgd		4.5 mgd	0.76 mgd
Available Expansion Capacity	8 mgd	15 mgd			N/A	N/A
Available Sewer Capacity for Region Prior to Expansion	1.5 mgd	1.8 mgd				
Current Sewer Rate	\$40	\$36.80	\$65			
Existing Connection Fee	\$9,500/ EDU	\$9,000/ EDU	\$65		\$6,443/ EDU	N/A

#### Table A-1 Alternative Evaluation Matrix

(a) Not viable alternatives due to lack of capacity and/or lack of interest in regionalization.