CITY COUNCIL AGENDA ITEM NO. H.6
12/09/2025

SUBJECT: Wastewater Treatment Plant Expansion Cost Update and SB 1383 Compliance Alternatives Discussion

DEPARTMENT: Public Works

STAFF: Casey Wichert, Director of Public Works
Mark Huber, Wastewater Operations Manager

TITLE/RECOMMENDATION

Receive an update discussing the cost increases associated with the Wastewater Treatment Plant Expansion – Phase II project ("Project"), and discuss SB 1383 compliance options related to wastewater biosolids.

FISCAL IMPACT

There are no costs associated with this report. If after receiving this report, the City Council wishes to continue moving forward with the installation of the biosolids pyrolysis system portion of the Project, approximately $28.6M in additional funding would be required, and staff would return with more details related to how such funding would be secured, with the likely option being a bond. The additional funding, or loan repayments, would be split approximately 52% Wastewater Enterprise funds and 48% Wastewater Development Impact Fees.

BACKGROUND

The adopted Capital Improvement Program describes the Wastewater Treatment Plant Expansion – Phase II project as follows:

> The existing 5 MGD [million gallons per day] tertiary treatment facility was planned and constructed to accommodate future expansions. The Phase II Expansion is designed to treat 6.4 MGD flow based on 69 GPD [gallons per day] per capita, which will service the final buildout population per the current General Plan, and accommodate planned and approved development of the City. The project includes the addition of one diffused aeration basin and one secondary clarifier, retrofit of existing oxidation ditches, converting chlorine contact facilities to free chlorine disinfection, solids dryer and pyrolysis system, Electrical Distribution System Upgrade and related appurtenances. This project is

necessary to keep the City in compliance with more stringent discharge requirements.

This Project is necessary to ensure the City can accommodate the growth contemplated in the current General Plan. The Wastewater Treatment Plant (WWTP) is currently at 82% of its permitted capacity. Expanding the WWTP capacity from 5 million gallons per day (mgd) to 6.4 mgd provides sufficient capacity to accommodate a population of 92,336, which represents full build-out of the City as contemplated in the General Plan.

Pre-Construction Cost Estimates

The Project first showed up in the Capital Improvement Program ("CIP") in FY 03/04. At the time, the City was growing rapidly and it was anticipated that the WWTP would need to expand beginning as early as 2007. When the economy slowed down due to the housing market crash in 2007, plans for the Project were put on hold. Development eventually picked up again, and in FY 14/15, staff added the Project to the CIP. At that time there were no data or projections to base this cost on other than the 2000-2003 WWTP construction cost, which was $39.3M. Adjusting for inflation, and assuming a 2.5 mgd capacity increase, staff arrived at $28M as a budgetary estimate.

In late 2015, the City Council approved a contract with Woodard & Curran (formerly RMC Water and Environment Engineers), for $4.6M to design the Project and design work began in early 2016. Early in 2016, the Project engineer notified staff that the initial cost estimate was likely too low. Consequently, during the FY 16/17 CIP budget adoption, the Project budget was increased to $40M.

In February 2017, the City received the engineer's 30% design level estimated Project cost. The 30% estimate anticipated the Project costs to be $46.8M for construction, $2.3M for change orders, $3.9M for construction management, $4.6M for engineering design services, and $0.3M for CEQA work, for a total Project cost of $58M.

By September 2017, the Project reached the 90% design level, and the Project engineer's estimated Project cost had increased to $62.4M, so the FY 18/19 CIP budget was increased again. State Revolving Fund ("SRF") loan funding was not finalized until 2019, and although the design was complete, the Project could not begin, so the estimated Project cost continued to increase with inflation.

In early 2020, the City solicited bids for just the construction portion of the Project. The Project scope included both a capacity increase component, and a biosolids system upgrade component. However, bidding instructions required contractors to submit the costs for the capacity increase portion of the work as the base bid, and

the costs for the biosolids system upgrade separately as a bid alternate. Bids were received in May 2020, with costs ranging from a low of $67.5M to a high of $73.6M. The table below shows the breakdown for the capacity increase and biosolids upgrade portions of the Project.

	C. Overaa & Co.	Western Water	Flatiron West
Capacity Increase	$44.5M	$51.6M	$52.2M
Biosolids Upgrade	$23.0M	$19.5M	$21.4M
Total Construction Cost	**$67.5M**	**$71.1M**	**$73.6M**

The construction bids were significantly higher than the Project engineer's estimate. As shown in the following table, when factoring in the additional costs of engineering, construction management, and change orders, the total Project cost surpassed the authorized FY 20/21 CIP Project budget of $70.1M.

	C. Overaa & Co.
Construction	$67.5M
Change Orders	$6.8M
Construction Management	$5.1M
Engineering Design and Services During Construction	$6.7M
CEQA	$0.2M
Total Project Cost	**$86.3M**

Due to the increased Project cost, the Project was essentially divided into separate parts. In order to move forward with the capacity increase portion of the Project, and stay within the approved CIP budget, the biosolids upgrade portion was postponed. In addition, staff needed time to evaluate a new technology for the biosolids upgrade portion of the work. For these reasons, staff recommended the City Council award the base bid, which covered only the capacity increase portion of the work, but decline to award the bid-alternate biosolids system upgrade work.

WWTP Capacity Expansion

On June 23, 2020, the City Council approved a construction contract with C. Overaa & Co. for $49M (including 10% contingency). The Council also approved a $5.1M contract with PSOMAS for construction management services of the Project in June 2020, and in July 2020, Council also approved a $2.1M amendment to the contract with Woodard & Curran for engineering design services during construction.

Actual construction for the capacity increase portion of the Project began in July 2020, and was anticipated to take 30 months. There were several complications early on in the Project, mostly centered around design issues related to a new 21,000 volt PG&E service, and labor and supply chain issues related to COVID-19.

These delays resulted in two change orders for the capacity increase portion of the Project. In November 2023, the City Council approved a $1.7M contract amendment with PSOMAS for additional construction management services in order to keep the construction management team engaged on the Project throughout the delays. In October 2025, the City Council directed staff to bring back a contract amendment with C. Overaa in the amount of $1.5M to fund the work remaining to complete the capacity increase portion of the Project.

This portion of the Project is approximately 95% complete, pending a new 21,000 volt PG&E service connection and start-up, and commissioning of several new systems that are waiting on PG&E power to be available. When this work is completed (currently anticipated to be done in spring 2026), the WWTP will have sufficient capacity to service the estimated build-out population projected in the current General Plan. No additional capacity increase will be needed unless the General Plan changes or the City's population exceeds anticipated projections.

Biosolids System Upgrade

In addition to treated wastewater, another product of the wastewater treatment process is biosolids. These are nutrient-rich, semi-solid materials left over from the wastewater treatment process of separating solids from liquid sewage. This leftover material is then stabilized through digestion, composting, or drying, yielding varying classes of biosolids.

The biosolids system upgrade portion of the Project is necessary to meet the requirements of SB 1383 for biosolids disposal. The existing WWTP biosolids process was specifically designed around the assumption that landfill disposal would remain a readily available, long-term and cost-effective method for biosolids disposal. As a result, the biosolids produced by this existing process do not currently meet the criteria required for any other disposal options.

Historically, WWTP's in California have disposed of biosolids in one of two ways: they are used as daily cover for garbage at landfills, or they are spread on farmland as fertilizer. The choice to land apply as fertilizer, or take biosolids to a landfill depends on several factors including: the treatment level of the biosolids, the availability of farmland and various crop types, and the proximity to landfills. Regardless of the disposal method, the most important factor is the treatment level of the biosolids.

Prior to the passage of SB 1383, all biosolids were eligible for landfill disposal, but only certain biosolids were eligible for land application as fertilizer. In order to land apply biosolids for use as fertilizer, WWTP's have to meet strict U.S. Environmental Protection Agency ("EPA") requirements (codified at 40 CFR part 503), which were adopted in 1993 to set rules for biosolids disposal. The regulations established specific criteria that had to be met for various disposal options, and resulted in four distinct biosolids classifications: Unclassified, Class B, Class A, or Exceptional Quality ("EQ").

Prior to SB 1383, roughly 30% of WWTP's in California disposed of biosolids in landfills, while 70% produced Class B or A biosolids that meet the requirements for various land application. The City currently produces Unclassified biosolids, which are not eligible for land application, and can only be taken to a landfill.

ANALYSIS

In determining the best manner in which to complete the biosolids portion of the Project, three factors have driven staff's work: (A) the most efficient and cost-effective biosolids disposal options to comply with SB 1383, (B) compliance with anticipated future regulation of Per– and Poly– Fluorylalkyl Substances ("PFAS"), and (C) costs already expended. An analysis of each follows.

A. Biosolids Disposal Options

Staff identified five options that comply with SB 1383 requirements. The options are discussed below and include the following:

1. Haul liquid biosolids to another local WWTP for processing.
2. Haul dewatered biosolids to another local WWTP for processing, or an out of state landfill.
3. Install an anaerobic digester to meet land application requirements for biosolids to be used as fertilizer.
4. Install a thermal dryer.
5. Install a pyrolysis system.

The first two options would allow the City to use the existing biosolids process, and would not require the addition of a new treatment process, or the high capital cost associated with it.

1. Haul Liquid Biosolids

Biosolids can be hauled in liquid form to another local agency for processing and treatment. Hauling biosolids in liquid form is inefficient and would require the City

to find another local agency that 1) is willing to accept and process the liquid biosolids, 2) has available digester capacity to process the biosolids, and 3) has existing biosolids disposal options that comply with SB 1383. Finding another agency that meets these criteria is unlikely. To make it less likely, there is no additional benefit to another agency to take additional biosolids, so they would likely charge a premium for this service. Assuming there is another agency that meets this criteria, the estimated cost would exceed $6M per year in order to pay for the 10,000 truckloads the City would generate annually if biosolids were hauled in liquid form. Additionally, the City would likely need to increase Pavement Management Program funding to deal with the additional wear and tear on local roads the additional truck traffic would cause.

2. *Haul Dewatered Biosolids*

Hauling biosolids in solid form is significantly more efficient as it reduces the number of trucks required from 10,000 to less than 400 annually, which greatly reduces the associated hauling costs. However, there is only one facility in California capable of accepting unclassified biosolids, and the cost of disposal there is four times the existing landfill disposal cost. Outside of that facility, the dewatered biosolids would have to be hauled to an out of state landfill. Between the disposal fees at the California facility that accepts unclassified biosolids, and the trucking costs to go out of state, these options pencil out roughly the same at $2M per year. In addition to the cost, any future ban on biosolids to landfills in other states would make this option untenable.

The three remaining options to comply with SB 1383 involve installing a new treatment process that would produce Class B, A, or EQ biosolids. Those options include installing an anaerobic digester, a thermal dryer, or a pyrolysis system. Each of these options have high capital costs, and two of them add significant annual operating costs.

3. *Install an Anaerobic Digester*

Installing a digester would produce Class B biosolids and allow for land application of biosolids. In order to land apply the biosolids as fertilizer the City would have to find a farmer willing to accept the biosolids for use as fertilizer. That can be problematic with Class B biosolids as this class is considered the minimally accepted treatment level for biosolids and not all crops are eligible to be grown on land where Class B biosolids are applied. Class B biosolids are used as fertilizer for crops like alfalfa or wheat that are used as livestock feed. Crops that are used for human consumption like tomatoes, onions, etc., require Class A or EQ biosolids.

In 2024, the cost to construct a digester was quoted as $43.6M, with an additional $1M per year anticipated in operating and maintenance (O&M) expenses. In addition to the high construction costs, digesters add operational complexity and require significant labor effort, likely resulting in additional staffing needs.

4. Install a Thermal Dryer

The original Project design included a thermal gas drying system and a large dried biosolids storage area that was intended to produce Class A or EQ biosolids so land application (without the restrictions associated with Class B biosolids) would be a viable disposal alternative. Thermal gas dryers burn natural gas as a heat source to evaporate water and dry biosolids. This Project would have required an expansion of the PG&E natural gas pipeline on Sunset Road and Elkins Way, and would have resulted in the ongoing use of a significant amount of natural gas. Ongoing O&M costs for thermal dryers are significant, primarily driven by the cost to purchase natural gas and increased electrical energy demand.

In 2020, the cost for a thermal gas drying system, including engineering, construction management, and change orders was $29.4M, with an additional $1M per year anticipated in O&M expenses.

5. Install a Pyrolysis System

Similar to thermal dryers, pyrolysis systems produce Class A or EQ biosolids by evaporating water and drying out biosolids. Pyrolysis systems are unique from thermal dryers in that they heat biosolids to a much higher temperature (700°–900° F) in an oxygen-free environment. This combination of higher temperature and lack of oxygen results in a near complete destruction of organic contaminants.

The estimated cost to install a pyrolysis system, including construction management and change orders, is $28.6M. Ongoing O&M expenses are anticipated to be $400k per year, which is significantly lower than thermal dryers because the pyrolysis process is more self-sufficient in that it produces its own fuel and does not require an ongoing fuel source like natural gas. In addition, the pyrolysis process produces "biochar" which has a commercial value and can be sold for use in several markets, resulting in a small new revenue source.

As the Project currently includes a pyrolysis system, this has already been studied under the California Environmental Quality Act ("CEQA"). Selecting another option for complying with SB 1383 may necessitate new CEQA review of the new system.

B. Compliance with Anticipated Future Regulation of Per– and Poly–Fluorylalkyl Substances (PFAS)

An additional consideration for the biosolids system upgrade is PFAS. PFAS are a class of man-made chemicals shown to have harmful effects on humans. They persist indefinitely in the environment, which is why they are referred to as "forever" chemicals. Many states have enacted legislation to regulate PFAS, with approaches varying from outright bans in consumer products, to setting drinking water standards. National class-action lawsuits against PFAS manufacturers are working their way through the courts, and Federal and State regulations are beginning to take shape, with the EPA classifying PFAS as a hazardous substance in 2024.

At least 10 states actively regulate PFAS in biosolids, with some states enacting outright bans, while others have bans triggered by monitoring levels. The California State and Regional Water board staffs are following national trends and are waiting on the EPA to finalize its risk assessment and federal standards before establishing state-wide enforceable limits, but they have already mandated monitoring and data collection. An immediate ban on land application of PFAS-contaminated biosolids does not appear likely, but PFAS contamination limits appear inevitable.

For all these reasons, PFAS is a major consideration in the decision as any short-term SB 1383 compliance measure is likely to require additional measures to deal with PFAS. Of all the options discussed above, only Option # 5 (pyrolysis) removes PFAS.

In 2023, staff's recommendation to purchase a pyrolysis drying system was aided by the fact that it had lower O&M expenses and did not require the ongoing use of natural gas, but ultimately came down to the removal of PFAS. Staff's concern was that a pyrolysis system would have to be installed *in addition to* a digester or a thermal dryer when PFAS regulations went into effect.

The table below summarizes each option and shows which options comply with SB 1383, which ensure the City complies with anticipated future PFAS regulations, and what the estimated costs are.

Option	Result	SB 1383 Compliant	Destroys PFAS	Annual O&M Cost	Capital Cost	Additional Cost for PFAS
1. Haul liquid biosolids	Unclassified, 10,000 trucks annually, local roadway wear & tear, uncertain viability	Yes	No	$6M	$0	$28.6M

Option	Result	SB 1383 Compliant	Destroys PFAS	Annual O&M Cost	Capital Cost	Additional Cost for PFAS
2. Haul dewatered biosolids	Unclassified, 400 trucks annually, increased disposal costs, out of state disposal, additional regulatory uncertainty	Yes	No	$2M	$0	$28.6M
3. Install digester	Class B, limited fertilizer options, added complexity and labor	Yes	No	$1M	$43.6M	$28.6M
4. Install thermal dryer	Class A, more fertilizer options, ongoing fuel usage	Yes	No	$1M	$29.4M	$28.6M
5. Install pyrolysis	Class A, options in addition to fertilizer, revenue generator	Yes	Yes	$0.4M	$28.6M	$0

C. Costs Already Expended

The final factor to consider is that the City has already purchased a pyrolysis system at a cost of $23.4M. If an option other than installing the already-purchased pyrolysis system is considered, the City will lose a considerable amount of its investment, as the resale value of a system like this will be a small fraction of the purchase price.

Conclusion

Staff's recommendation is to move forward with installation of the pyrolysis system, which will not only comply with SB 1383 mandates, but will ensure the City does not have to expend additional funds for PFAS compliance in the future and will yield the best return on the funds already expended to purchase a pyrolysis system.

CITY COUNCIL STRATEGIC INITIATIVE

Focus Area 1, Goal 2.a - Water, Wastewater and Solid Waste Services: Provide safe and sustainable water, wastewater and solid waste services for the build-out of the City per the City's General Plan.

PREVIOUS ACTION

Previous Action by the City Council is included on Attachment 1.

DATE OF NOTICE

Not Applicable

ENVIRONMENTAL DETERMINATION

Not Applicable

ALTERNATIVE OPTION(S)

Alternative Options to comply with SB 1383 requirements for biosolids include:

1) Haul liquid biosolids to another local WWTP for processing.
2) Haul dewatered biosolids to another facility for processing or an out of state landfill.
3) Install an anaerobic digester to meet land application requirements for biosolids to be used as fertilizer.
4) Install a thermal dryer.
5) Install a pyrolysis system.

ATTACHMENT(S)

1. Previous Action