APPENDIX 4.5

CECorps Wastewater Evaluation for Walnut Avenue

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Walnut Ave Water System #2 Wastewater Evaluation

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Introduction

Walnut Ave Water System #2 (System) is served by one groundwater well which serves 6 dwellings for domestic use. The System is located just west of the City of Greenfield, on Walnut Street, between Thirteenth and Fourteenth Street. Figure 1 shows Walnut Ave Water System #2' location in relation to the City of Greenfield, as denoted by the yellow dashed boundary.





Walnut Ave Water System #2 faces wastewater management challenges. The System contains two active septic systems with one system experiencing periodic ponding in the leach field due to overloading. This report describes the System's wastewater system, and summarizes wastewater management options along with costs. In addition to the wastewater issues, the system faces nitrate contamination. The recommendations for the water system are in a separate document titled "Nitrate Mitigation Study".

Wastewater System Description

The Walnut Ave Water System #2 property contains an inactive well, and two septic systems with leach fields located on opposite sides of the property. The Drinking Water System consists of an active well and storage tank along the northwest edge of the Walnut Ave Water System #2 property. The well provides unchlorinated potable water for 20 to 30 residents including approximately 18 children. Water for crop irrigation is purchased separately from local irrigation canals. Figure 2 shows a map of the locations of this infrastructure.



Figure 2. Aerial map of water and wastewater infrastructure at Walnut Ave Water System #2



The two existing septic systems each serve three of the six homes. The Eastern-most septic system serving the main household and two mobile homes, functions properly and was previously modified to include a second drainage line. For the second system, the owner reports that there is periodic ponding in the leach field, likely caused by the leach field not adequately sized for the volume and soil conditions. The owner said that the first leach field used to have similar issues prior to modifications and now routinely switches between the two lines to avoid saturating the ground in the first system. It should also be noted that if additional drinking water were available to Walnut Ave Water System #2 residents, sewage volumes may also increase, further overwhelming the second leach field.

Overview of Wastewater Alternatives

Consolidation

One option to provide sanitation to the community is to connect to the City of Greenfield's Wastewater system. At the May 10, 2016 meeting with the City of Greenfield's community development staff, it was confirmed that there was adequate capacity in the wastewater treatment plant to add these additional customers.

Annexation is not a requirement to be connected to the City's wastewater system, but City staff reported that their preference would be for annexation if they were to provide both water and sewer service to a property. Further meetings with the Monterey County Local Area Formation Commission (LAFCo), however, confirmed that annexation would not be allowed in this case because the subject

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property is outside the City's sphere of influence. In either case, the City and the property owner have confirmed that annexation will have little impact on the cost of services and taxes. It may impact building permit requirements in the future.

Adjacent Communities

While the initial purpose of this project was to provide adequate sanitation for the residents of Walnut Ave Water System #2, there are several other communities along the pipeline route who may also be able to benefit from the project. These locations of these communities are shown in Figure 3. The Apple Ave Water System #3, the Mittelsteadt properties (Apple Ave Water Systems #1 and #4), and the Apple Ave Water System #2, are all candidates for consolidation to the wastewater system. In particular, the Apple Ave Water System #2 has also experienced issues with their septic system.





Leach field Expansion

One option to reduce the leach field overloading is to add additional land area to the leach field by adding a second drainage line. This solution was already implemented on the first leach field for the property.

Consolidation Cost Estimates

For consolidation with the City of Greenfield's wastewater system, the sewer line would be approximately 4510 feet long and connect to the City's system at the intersection of Victorian Circle and Apple Avenue, which is the closest point where a tie in can be located.

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For pipeline extension cost estimates, three scenarios representing consolidation options with the City of Greenfield were evaluated. Table 1 provides a description of each pipeline extension scenario. The price assumes that packaged lift stations will be installed at the location of both septic tanks for the Walnut Avenue Water System #2 and the line feeding to the City system will be a force main, which would feed into the gravity fed system. The service for the Apple Avenue Water System #3 would not require a packaged booster system and could gravity feed directly into the sewer system. For each scenario, costs for installed capital equipment, service connections, manholes, permitting, design, construction, and management are included. Costs for pipeline extension to the Apple Ave Water System #2 are not included. These additional systems would be of a similar design with individual lift systems.

If consolidation of both potable water and wastewater systems occurs, the potable water supply line may not be installed in the same trench and must be at least 10 ft. horizontally from and 1 ft. vertically above the sewage line.

Scenario	Description	Pipeline Length (ft.)
Option A	Pipeline extension to Walnut Ave Water System #2 only	4,510
Option B	Pipeline extension to Walnut Ave Water System #2 and Apple Ave Water System #3	4,510
Option C	Pipeline extension to Walnut Ave Water System #2, Apple Ave Water System #3, and Mittelsteadt properties	5,260

 Table 1. Pipeline Extension Scenarios

Cost estimates for all three pipeline extension scenarios are summarized in Table 2. As seen in Table 2, the total installed capital cost for pipeline extension to Walnut Ave Water System #2 is estimated at \$0.88M. The cost adder for additional pipeline, an additional packaged lift system and service to the Mittelsteadt property is \$0.21M, resulting in an installed total pipeline extension capital cost of \$1.09M.

Although the addition of pipeline and services to the Mittelsteadt property results in an overall \$0.21M increase in installed capital costs, the total installed capital cost for pipeline extension per system is decreased from \$0.44M to \$0.36M. Average costs per system for all three pipeline extension scenarios are also shown in Table 2. The monthly bill per household is anticipated to be about \$30, with approximately \$120 per month needed for maintenance and replacement of the two sewer lift stations.

Table 2. Total capital costs for pipeline extension

	Option A (Walnut Ave Water System #2 only)	Option B (Walnut Ave Water System #2 and Apple Ave Water System #3)	Option C (Walnut Ave Water System #2, Apple Ave Water System #3, and Mittelsteadt)
Total Installed Capital Costs	\$0.88M	\$0.88M	\$1.09M
Cost Per System	\$0.88M	\$0.44M	\$0.36M

Leach Field Expansion Cost Estimates

Current water usage for the system is unknown, and water usage will likely increase as a result of the water project. As such, an estimate of the volume entering the leach field was estimated based on per

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capita demand in the region as 77 gallons per person per day, with a 1.8 factor for maximum day. Since this leach field serves half the residents of the property, the estimated volume per day is 1400 gallons per day. A percolation test was not performed as part of this preliminary analysis, so a conservative percolation rate of 1 inch per hour was used. This is lower than rates typically seen in Greenfield. Assuming a 2-foot wide trench, the needed length of pipe is only 47 feet of leach field pipe is needed, and the current design is conservative. Given that the leach field is not working as designed for the current use, this suggests that it is either plugged from use, water use is very high for the community (unlikely), poorly designed or percolation rates at this specific site are significantly different than the surrounding area.

The leach field expansion cost estimate is based on the addition of a 200 ft. second drainage pipe, which is similar to what was installed for the companion leach field for the property. This is a conservative estimate, which could be reduced with an onsite percolation test. This estimate is inclusive of costs for surveying, design, inspection, construction, and project management. Although the Community Engineering Corps volunteer team is not currently aware of any grants for leach field expansion, additional costs of grant administration is also incorporated into the cost estimate. Based on this criterion, the total installed capital costs for leach field expansion is \$41.4K.

Grant Eligibility

The conversion from septic system to a sewer may be partially eligible for grant funding. The Clean Water State Revolving Fund (CWSRF) has a small community grant fund. Systems that qualify as economically Severely Disadvantaged Community (SDAC) are eligible for up to 75% grant funding. You can refer to Table 4 of the 2015-16 CWSRF Intended Use Plan for more information:

http://www.waterboards.ca.gov/water_issues/programs/grants_loans/small_community_wastewater_ grant/docs/table_4.pdf

Summary Wastewater Options and Costs

The Environmental Coalition for Water Justice (EJCW) is working with each community to assess the options and come to a decision about which solution is best. Therefore, the Community Engineering Corps volunteer team is not making a specific recommendation. Rather this section provides a summary of the benefits and costs of options that were evaluated.

20-year annualized capital costs for pipeline extension and leach field expansion are shown in Figure 4. For the pipeline extension scenarios, the average cost per system is used and a description of each scenario can be referenced in Table 1 above.







Leach field expansion is the lowest cost option with total installed capital costs of \$41.4K. Despite this, leach field expansion may not be grant eligible and all costs would then be borne by the property owner. The consolidation option, while more expensive, may be grant eligible for up to 75% grant funding. Further evaluation of potential grant funding options should be conducted.