Wild Wings County Service Area

Woodland, California

Wastewater Feasibility Study

Prepared By: Ponticello Enterprises Consulting Engineers Inc.

446 Third Street

Woodland, Ca. 95695

(530) 668-5883

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I. INTRODUCTION

The County of Yolo has commissioned this study to evaluate the feasibility of various options for increasing the reliability of sewage treatment for the Wild Wings community. This study is intended to present the various advantages and disadvantages for each of the options studied.

An Engineering Report entitled "Engineering Report for Production, Distribution, and Use of Reclaimed Water", dated June 2001, was prepared by the developer of the Wild Wings community as part of the original permitting process for the wastewater treatment facility. However, not all of the reliability features presented in the report where actually provided at the facility. Therefore, the Wild Wings wastewater treatment plant is not in complete compliance with State regulations.

The Wild Wings wastewater treatment plant operating permit will need to be renewed within the next few years. Part of the permit renewal process is to update the Engineering Report which, among other issues, provides details on how the plant will achieve reliability. This feasibility study provides the information needed to make an informed decision on which option to move forward with, which will be needed for the permit renewal process.

This feasibility study is also being conducted in follow-up to a regionalization study that was jointly conducted in 2013 by the City of Woodland and the County of Yolo. The 2013 study entitled "City of Woodland and Yolo County Service Areas Water and Wastewater Regionalization Feasibility Study" determined that it was feasible to regionalize wastewater treatment within Yolo County by sending sewage from outlying County Service Areas (CSAs) and Community Service Districts (CSDs) to the City of Woodland's Water Pollution Control Facility. This current study reviewed regionalization only as it pertains to the Wild Wings community, and not for any of the other entities within the county.

The options reviewed in this study to increase reliability for the wastewater treatment facility, are as follows:

- Option 1 – Build a Second Plant the Same Size as the First Plant
- Option 2 – Build Additional Emergency Storage
- Option 3 – Provide a Combination of Redundant and Standby Equipment
- Option 4 – Build a Second Smaller Plant
- Option 5 – Connection to Woodland
- Option 6 – Do Nothing

II. DESCRIPTION OF THE WASTEWATER TREATMENT SYSTEM

Administration

The County of Yolo manages the Wild Wings wastewater treatment facilities under the umbrella of a County Service Area (CSA). CSAs provide a mechanism for small communities in unincorporated areas to pay for and receive the types of services and improvements not available in other parts of the County. The Wild Wings CSA is managed by the Yolo County Administrator's Office, advised by a 5 member Advisory Committee made up of Wild Wings homeowners and governed by the Yolo County Board of Supervisors. Advisory Committee members are appointed by the County Supervisors for a term of 4 years and serve in an advisory capacity only. After considering the recommendations of staff and the Advisory Committee, the Board of Supervisors makes final decisions regarding the facility. The County contracts with an operator to handle the daily operations and maintenance of the plant. Because the wastewater facilities are administered under a CSA, Wild Wings property owners are responsible for providing all of the funds needed to operate the plant. In other words, the County does not use monies collected from other parts of the County to provide services to the Wild Wings community.

Sewage Treatment Facilities

The Wild Wings wastewater treatment facilities were built in 2004 and are in the process of partial rehabilitation. The sewage treatment facilities consist of the collection system, a force main, two pump stations, and a 101,000 gallons per day (gpd) tertiary treatment plant. The wastewater treatment plant currently processes about 55,000 gpd, on average. This is a relatively small wastewater treatment facility.

Emergency Facilities

The plant has an existing 24 hour emergency storage pond which has a capacity of about 313,000 gallons. The pond is lined with 2 feet of compacted clay which is overlain by a High-Density Polyethylene (HDPE) liner.

The plant is equipped with a standby emergency generator which comes on automatically whenever there is a power outage at the site. It is sized to be able to run the entire plant for an indefinite period of time, as it is connected to a continuous natural gas source.

There is an alarm system in place that will automatically call an operator if an alarm condition is experienced such as a pump failure or a high-water level at the wastewater plant.

Recycled Water

Approximately 21 million gallons of recycled water are currently produced by the wastewater treatment plant each year. The recycled water is delivered to the Wild Wings Golf Course where it is used to irrigate the turf. The total amount of water used for irrigation of the golf course each year is about 56 million gallons. Thus, about 38 percent of the water used by the golf course for irrigation is recycled. The remaining 35 million gallons is currently supplied by

groundwater through the onsite Canvas Back well. The golf course uses additional water from the Canvas Back well to offset evaporation losses from the ponds located throughout the golf course, as needed.

III. WASTEWATER TREATMENT PLANT OPERATIONAL ISSUES

Odor Issues

There have been reports of odors originating from the wastewater plant intermittently over the past several years. The odors are noted primarily by residents that live closest to the facility. In recent months, the odor issues have resolved with the rehabilitation of the plant and the new operating procedures that are in place. However, the possibility remains that the community may experience occasional odors from the operation of the wastewater treatment plant.

The odors originate primarily from the head of the plant, and to a lesser degree from any sewage present in the emergency storage pond. The risk for odor decreases with the proper operation of the wastewater plant, by keeping the water levels low in the equalization tank, and by not storing raw sewage in the emergency pond for extended lengths of time.

Overflow Issues

The wastewater collection system has experienced two overflow events in the past two years. These events were caused by pump failures at the pump stations. The lack of standby pumps (redundancy) and a concurrent failure of the alarm system (reliability) contributed to the overflows. These problems have since been addressed by the rehabilitation of the pump stations in 2018.

The wastewater treatment facility has also experienced overflows at the plant during 2017. These overflows were attributed to improper operation of the facility. This problem has now been corrected through operations and maintenance oversight.

IV. FUNDING OF DESIGN AND CONSTRUCTION

The Clean Water State Revolving Fund (CWSRF) is a key funding source for the wastewater infrastructure projects proposed in this study. The CWSRF was established by the 1987 amendments to the Clean Water Act as a financial assistance program for a wide range of water infrastructure projects, under 33 U.S. Code §1383[1]. The program is a partnership between the United States Environmental Protection Agency (US EPA) and the states. Under the CWSRF, the US EPA provides grants to all 50 states to capitalize state CWSRF loan programs, and the states contribute an additional 20 percent to match the federal grants. Using this combination of federal and state funds, state CWSRF programs fund a wide range of projects, including, but not limited to, the planning, design and construction of:

- municipal wastewater facilities;
- control nonpoint sources of pollution;
- decentralized wastewater treatment systems;
- green infrastructure projects; and
- protect estuaries

The California State Water Resources Control Board (SWRCB) is responsible for the operation of the CWSRF program in the state. Under the CWSRF, the SWRCB provides various types of assistance, including loans, refinancing, purchasing or guaranteeing local debt and purchasing bond insurance. The typical loan terms offered by the SWRCB include interest rates from zero percent to market rate and repayment periods of up to 30 years. The 2018 interest rate is 1.8%[2]. The planning and design costs[3] eligible for CWSRF funding include, but are not limited to:

- Feasibility studies/project reports
- Plans and specifications
- Financial analyses
- Environmental documents

To the extent consistent with the federal and state authority, the following construction costs eligible for CWSRF funding include, but are not limited to[4]:

- Treatment facilities, including new collection systems to serve existing homes or businesses or new development in infill areas within the existing service area, alternative treatment facilities such as leach fields, mound systems, and

[1] United States Environmental Protection Agency. (2018). Learn About the Clean Water State Revolving Fund (CWSRF). Retrieved from https://www.epa.gov/cwsrf/learn-about-clean-water-state-revolving-fund-cwsrf

[2] State Water Resources Control Board (March 18, 2016). *Calculation of True Interest Cost for Bond Sale.* Retrieved from https://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/docs/trueinterestcost.pdf

[3] State Water Resources Control Board. (February 17, 2015). *Policy for Implementing the Clean Water State Revolving Fund.* Retrieved from https://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/docs/final_policy_0215.pdf

[4] State Water Resources Control Board. (February 17, 2015). *Policy for Implementing the Clean Water State Revolving Fund.* Retrieved from https://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/docs/final_policy_0215.pdf

constructed wetlands, and equipment or systems to reduce energy use or reduce the effects of climate change;

- For treatment works projects, the leasing and fee-simple purchase of land necessary for construction.
- Pre-purchased material and equipment used in the project and purchased in accordance with state law;
- Reserve capacity for treatment plants, pump stations, and pipelines per Section IX.D.1;
- Process control systems;
- Recycled water distribution and storage system capacity purchases directly related to the operation of eligible facilities consistent with the Water Recycling Funding Program (WRFP) Guidelines;
- On-site solids handling systems necessary to meet Regional Water Board waste discharge permit requirements, including systems that perform thickening, stabilization, and dewatering of sludge as a means of preparing it for beneficial reuse and/or ultimate disposal;
- Stationary and mobile equipment that are integral to the treatment, collection, or sludge handling processes. Dedicated equipment must be confined to the treatment, collection, or sludge handling systems for which it was purchased;
- Costs for planning, design, construction management, value engineering, and administration;
- Equipment necessary to maintain the eligible treatment facilities, including the manufacturer's list of spare parts;
- Cost-effective buy-in for all of the proportional costs to connect to an existing treatment plant and/or collection system. Purchase of capacity is not considered refinancing;
- Recycled water systems (not including gray water systems)
- Water conservation measures

Based upon the eligible costs listed above, all of the options presented in this study could be fully or partially funded through CWSRF. However, financing through this program may be difficult to come by. Recent efforts by the SWRCB to improve the program and to encourage water recycling projects during the drought have dramatically increased demand on the CWSRF. The SWRCB's Division of Financial Assistance expects this high level of demand to continue in the future given the attractive terms available through the program. Nevertheless, once an option is selected, it is recommended that County staff work with the appropriate SWRCB staff to get a final determination of eligibility for all costs.

For purposes of this report, it was assumed that all of the upfront costs will be funded by a CWSRF loan for all of the options.

V. Proposition 218 Requirements

In November 1996, California voters approved Proposition 218, the "Right to Vote on Taxes Act", Articles XIII C and XIII D to the California Constitution. Proposition 218 imposes requirements for the levying of property-related fees by the Wild Wings CSA. Before a public agency can levy a new or increased wastewater fee, the following requirements must be met:

1) The agency must prepare a detailed engineer's report by a registered engineer certified by the State of California or a rate study which calculates the proposed fee for each parcel.
2) The record owner of each parcel must be given written notice by mail of the proposed fee, the total amount chargeable to the entire service area, the amount chargeable to the owner's particular parcel, the duration of the payments, the reason for the fee, and the basis upon which the amount of the proposed fee was calculated. Notice to the record owner must include the time, date, and location of a public hearing on the fee and disclosure that the fee will not be imposed if a majority of affected property owners submit written protests to the agency.
3) A public hearing to tabulate any submitted written protests must be conducted not less than 45 days after mailing the notice to landowners.
4) The agency shall not impose the fee if there is a majority protest. A majority protest exists if the protests submitted in opposition to the fee exceed half the total number of parcels facing the proposed fee. In tabulating the votes, each vote will be weighted one per parcel. Only one protest per parcel will be counted.

The County must identify all parcels in the CSA that will have a "special benefit" conferred upon them, for which the proposed fee will be levied. Under Proposition 218, a "special benefit" is defined as "a particular and distinct benefit over and above general benefits conferred on real property located in the district or to the public at large." Within the CSA, the special benefit provided to all parcels from the County is the improvements to the wastewater system, including infrastructure to provide wastewater service either from the County or from the City of Woodland to the CSA, and any debt-related expenses associated with this project.

The County recently went through a Proposition 218 process in 2018 to update the sewer charge based on a recently updated Engineer’s Fee Report and a need to repay a loan from the water fund. That Proposition 218 proceedings were successful and resulted in an increased sewer charge to provide wastewater collection and treatment for the community and to repay the loan. These funds are to support the current operations and maintenance of the facility and anticipated capital replacement costs. Once the County has reviewed this report, and with input and support from the community, decided upon an alternative, Proposition 218 proceedings will be necessary to adjust the sewer charge to pay for the project.

VI. STUDY METHODOLOGY

This study uses a "Triple Bottom Line Methodology" for evaluating and describing the alternatives where economic as well as social and environmental concerns must all be satisfied. This approach is commonly used in business evaluations and is sometimes referred to as "People, Planet, Profit," or the "Balanced Scorecard". Potential economic, social, and environmental drivers and concerns included in this study are as follows:

Economic Drivers and Concerns

- The order of magnitude estimates for the upfront capital costs and expected operation and maintenance (O&M) costs.
- The annual sewer service charges for wastewater conveyance, treatment, and disposal for the Wild Wings community.
- Low interest financing available for wastewater projects.

Social Drivers and Concerns

- Local impacts such as pipeline construction impacts, or potential growth inducement from regional facilities.
- County control versus being a customer of the City of Woodland.

Environmental Drivers and Concerns

- Regulatory requirements.
- Ability to produce recycled water for local use (golf course irrigation).

This study is organized into the following general sections:

- Wastewater Treatment Alternatives
    - Description of the alternative
    - Operation reliability
    - Recycled water production
    - Management
    - Regulatory considerations
    - Construction cost and funding
    - Summary of advantageous and disadvantageous
- Study Findings

The costs shown in this report are estimations only and cannot be refined without further investigations. The costs are based on 2018 prices and are expected to increase in future years. There is added uncertainty related to construction costs due to the potential of tariffs on materials and fluctuations in oil prices.

VII. WASTEWATER TREATMENT ALTERNATIVES ANALYSIS

Option 1: Build a Second Plant the Same Size as the First Plant

Description

Option 1 consists of constructing a duplicate of the wastewater treatment plant that currently exists at the site. The treatment plant would be designed for the same maximum flow rate of 101,000 gallons per day and would occupy the same footprint, which is approximately 24 feet wide by 165 feet long.

The footprint of the new plant would need to be split into two sections, as there is not enough space to place a second plant alongside the existing plant. The first section would consist of the equalization tank, aeration chamber, and clarifier, and this equipment would be located along the north wall of the wastewater treatment plant between the existing 24 hr emergency pond and the existing storm water pond. The second section would consist of the filter, chlorine contact chamber, and the solids handling tank, and they would be located on the south side of the existing filter.

In addition to the new plant, a building will need to be constructed to house additional motors and blowers. Refer to Figure 1 for a proposed layout of the facility.

Operation Reliability

The addition of a second plant as a backup system increases the overall reliability of the facility. The second plant would be utilized routinely in conjunction with the primary plant on an alternating basis. Alternating the use of both plants will keep all of the equipment operational, and allow for eyes-on inspections of portions of the plant that are habitually underwater.

In addition, the second unit would be operated whenever maintenance that required removing all the incoming wastewater from the plant was needed, such as for recoating operations of the tank, or welding inspections. Thus, with one unit off-line, all wastewater would be handled by the alternate unit until work on the first unit was completed and placed back into operation.

Recycled Water Production

The amount of recycled water that is produced by the existing facility would not change with the implementation of this option. The reliability of being able to produce recycled water without interruption, would be improved.

Management

The operation and management of the wastewater treatment plant would remain under the jurisdiction of Yolo County if the construction of a second unit was the chosen option.

Regulatory Considerations

State Requirements: Option 1 would require obtaining a new operating permit from the Regional Water Quality Control Board (RWQCB) in conjunction with the Department of Drinking Water (DDW). The RWQCB staff recommends applying for a permit under the General Waste Discharge Requirements for Small Domestic Wastewater Treatment Systems instead of under the individual permit option that that the County currently possesses. The RWQCB staff stated that applying for the general permit would be much less time consuming, on the order of a couple of months vs a year or more, respectively.

The RWQCB staff stated that the permit change would be allowed for Wild Wings as the threshold for using the easier Small Domestic Wastewater Treatment Systems permit is for communities that generate less than 100,000 gpd of sewage. As previously mentioned, Wild Wings wastewater treatment plant is averaging about 55,000 gpd. The assumptions used by the original designers resulted in an expectation that the community would generate greater amounts of sewage, on the order of 101,000 gpd.

Local Requirements: According to Yolo County Zoning Map 3, the wastewater treatment plant is zoned Public/Quasi-Public (PQP). The corresponding land use designation of the plant is Public/Quasi-Public (PQ), according to the Yolo County 2030 Countywide General Plan ("County's General Plan"). Table 8-2.804 of the Yolo County Zoning Code ("County's Zoning Code") shows that the construction of a treatment plant within a PQP zone requires Site Plan Review. Section 8-2.215 of the County's Zoning Code describes a Site Plan Review as follows:

> *"The purpose of the Site Plan Review approval process is to determine compliance between a more complicated development project seeking a building or related permit, not subject to discretionary review, with the provisions of this Code and the Yolo County General Plan. A Site Plan Review is triggered by a development application or use that is allowed "by right" yet is subject to specific zoning standards. These applications require a more thorough and lengthy review than a simple Zoning Clearance."*

Since Option 1 involves the construction of a treatment plant the same size as the current facility, a Site Plan Review application would be required based on the interpretation of the County's Zoning Code. The County's Zoning Code further states that Site Plan Review applications shall be submitted to the Planning Division, which shall approve, conditionally approve or disapprove such application or set the application on the agenda of the Planning Commission for interpretation and determination.

In addition to Site Plan Review, the County Building Department stated that construction of Option 1 would most likely require a Building Permit from the Yolo County Building Division.

Environmental Requirements: *Pursuant to the California Environmental Quality Act (CEQA) Guidelines § 15378, an activity is considered a "project" under CEQA when the activity meets the three criteria, as follows:*

- *An activity that has the potential for a direct physical change or a reasonably foreseeable indirect physical change in the environment, and*
- *An activity that involves a discretionary approval, and*
- *An activity is one of the following types of activities:*
    - *Activities directly undertaken by a public agency, which include public works construction activities, clearing or grading of land, improvements to existing public structures, enactment and amendment of zoning ordinances, and adoption and amendment of local general plans.*
    - *Activities that are supported (in whole or in part) by public agency, which include contracts, grants, subsidies, loans, or other assistance from a public agency.*
    - *An activity involving the public agency issuance of a lease, permit, license, certificate or other entitlement for use by a public agency.*

A discretionary project is one that requires the exercise of judgement or deliberation by a public agency in determining whether the project will be approved, or if a permit will be issued. Some common discretionary decisions include placing conditions on the issuance of a permit, delaying demolition to explore alternatives, or reviewing the design of a proposed project.

Upon review of these criteria, Option 1 qualifies as a "project" under CEQA. Planning Division staff recommends the preparation of an initial study to determine whether the project will have a significant effect on the environment and what type of environmental document to prepare. Based upon a cursory review of the preliminary site plan for Option 1, staff believes that a Negative Declaration or Mitigated Negative Declaration may be sufficient for the environmental review.

Construction Cost and Funding

The cost to implement Option 1 is relatively high as it provides a completely redundant system that will need to be constructed around the existing system without taking any of the existing system off-line.

There will also be associated piping, level sensors, pumps, aeration system, and SCADA (Supervisory Control And Data Acquisition) system controls. The cost to revise the Engineering Report and prepare the documents for the Waste Discharge Requirements will also need to be included.

The total construction cost to implement Option 1 is estimated to be $4,160,000. It is most likely that a loan will be required to fund this option. There will also be ongoing operation and maintenance costs, along with the cost of saving for future replacements for this option. These ongoing annual costs are estimated to be $107,000/year. Refer to Table 1 below for the cost breakdown for Option 1.

Table 1

Estimated Costs for Option 1 Build a Second Plant the Same Size as the First Plant		
Item	**Estimated Construction Cost**	**Estimated Increase in Ongoing Annual Costs[1]**
Treatment Plant (101,000 gpd)	$1,700,000	
Yard Piping	$176,000	
Blowers & Blower Building	$157,000	
Modify Existing Sludge Press	$30,000	
Control & Instrumentation	$497,000	
Subtotal	**$2,560,000**	
Contingency (30%)	$768,000	
Subtotal	**$3,328,000**	
Engineering, Construction Inspection, & Admin. (25%)	$832,000	
Total	**$4,160,000**	**$107,000**

Notes:

1. Ongoing annual costs (currently $920,815) are for operation, maintenance, and replacements.

Summary of Advantages and Disadvantages

Advantages:

- Option 1 provides the most flexibility for operation and maintenance activities if the processing of the wastewater is done at the Wild Wings site.
- Recycled water will continue to be generated for on-site use by the golf course.

Disadvantages:

- There is some difficulty in fitting a second plant on the site. In order to fit the second facility on the site, it will need to be separated into two parts, which will necessitate additional pumping from one section to the next.

- The construction to connect the new plant with the existing pump station, where the sewage comes into the plant, and the sludge handling facilities located at the tail end of the plant is likely to be very time consuming. Trenching will need to take place across the existing electrical conduits, emergency bypass lines, sewage pipelines, and domestic water lines, and the exact locations and depths of the pipelines are unknown.
- A second set of control panels will be needed to handle the programming for the automation of the various pumps, valves, motors, blowers, and other equipment.
- A new building will need to be constructed to house the additional blowers and motors.
- A complete second set of equipment will need to be maintained, which will slightly increase future operational and maintenance costs. Future Capital expenditure costs (reserve costs) for a second set of equipment will largely be offset because both sets of equipment will be running about half the time, with this option.

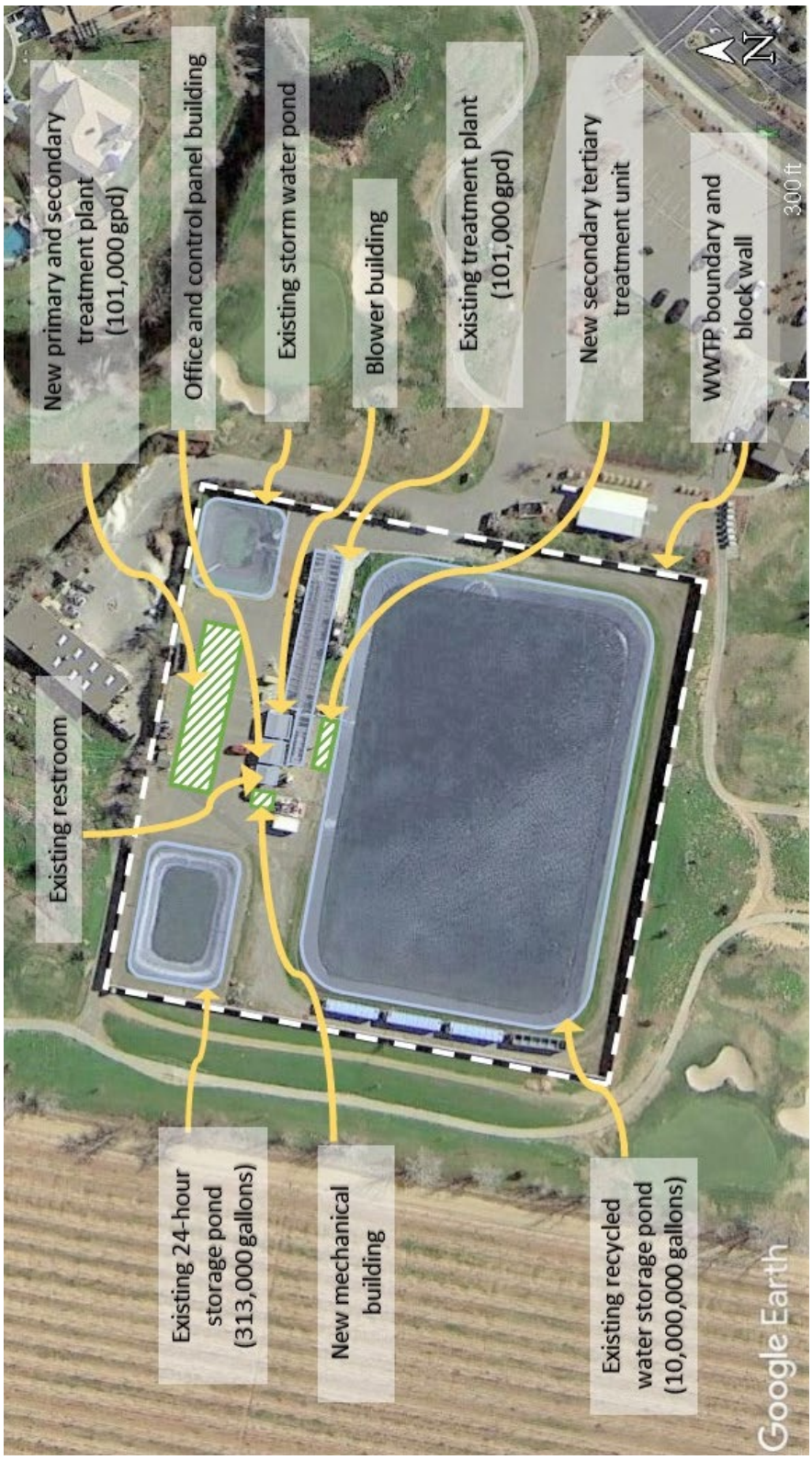

Figure 1
Option 1: Build a Second Plant the Same Size as the First Plant

Option 2: Build Additional Emergency Storage

Description

Option 2 consists of building additional emergency storage capacity that would be used to meet the California Code of Regulations, Title 22[5] (Title 22), which are currently not met by the existing facility. If emergency long-term storage is used to meet the reliability requirements, then the storage area must be capable of holding a minimum of 20 days of raw sewage. The facility must also include odor control, pump in and pump back equipment, and have a standby power source. The current facility was designed for short-term rather than long-term storage and meets the short-term regulatory requirements of 1 day of emergency storage capacity.

The average flow rate at the wastewater treatment plant is currently about 55,000 gallons per day (gpd). The plant was designed to handle 101,000 gpd. The RWQCB staff have stated that they would like to see a design with some allowance for higher flows and more current flow data that includes winter flows. A rate of 60,000 gpd will be used for purposes of this report. Therefore, a facility able to store 20 days of flow will need to hold about 1.2 million gallons of sewage. This number may need to be adjusted after reviewing another winter of flow data.

The new long-term storage pond would be located along the north wall of the wastewater treatment plant between the existing 24 hour emergency pond and the storm water pond. It would be a 45 foot by 170 foot by 10 foot deep pond, with a clay liner and an HDPE overlayment that matches the existing pond. This pond would add approximately 290,000 gallons of emergency storage.

The bulk of the additional long-term storage would be provided by using about 740 lineal feet of 11 foot by 11 foot concrete box culverts that would be buried along the east, west, and south sides of the existing recycled water pond. The box culverts would have a holding capacity of about 666,000 gallons. Two advantages of having the storage located underground are that odors would be contained within the culvert and that the land above the culvert could still be used for equipment access on three sides of the recycled water pond.

The total emergency storage provisions with the additional capacity would be about 1.27 million gallons. This total is just over 105 percent of the required 1.2 million gallons and, thus, meets the long-term storage requirement. Refer to Figure 2 for the proposed layout of the storage facilities.

Operation Reliability

The long-term storage facilities would be used to increase the reliability of the plant during equipment failures, routine maintenance, and plant upsets. Whenever a portion of the existing plant needed to have the sewage diverted to perform maintenance, replace broken

[5] The California Code of Regulations, Title 22, Division 4 - Environmental Health, Chapter 3 - Water Recycling Criteria, Article 8 - General Requirements of Design, and Article 10 - Reliability Requirements for Full Treatment.

equipment, or recoat or reweld the steel tanks, the sewage would be diverted to the ponds and away from the plant. Then, staff will have 20 days to make the repairs and get the plant back online before the storage facilities are filled to capacity.

Once the plant is back in operation, the problem becomes what to do with the sewage that was stored in the ponds. Once the sewage has sat for more than a few days in the ponds, the biological activity of it decreases and it begins to die off. If the stored sewage (including dead material) is then returned to the plant for processing, the plant can experience a die back of the good bacteria required to keep the plant running in good shape. If the plant becomes distressed, it may not be able to meet the permit requirements for disposal of recycled water to the golf course. The process of cycling all of the stored sewage back through the plant without upsetting the plant would take about 75 days or longer to complete.

The overall reliability of the facility with this option is increased over the current facility. However, handling the stored sewage after a diversion, and not having the emergency storage area available while wastewater is being recycled back through the plant, offsets some of the reliability of this option.

Recycled Water Production

The amount of recycled water would be reduced by the implementation of this option. The use of this option would result in approximately 1.2 million gallons of sewage not being treated and sent to the golf course during each diversion period (assumed to be 20 days). If the diversion occurred during the summer months, which is when the highest irrigation needs are experienced by the golf course, then the irrigation needs would need to be met by extra pumping of ground water from either the Canvas Back or Pintail wells.

Management

If Option 2 is selected, then the operation and management of the wastewater treatment plant would remain under the jurisdiction of Yolo County.

Regulatory Considerations

State Requirements: Option 2 would have the same State regulatory requirements as Option 1. Thus, a new State operating permit from the RWQCB in conjunction with the DDW would be required.

Local Requirements: While Option 2 does not involve the construction of another treatment facility of the same size, the location of the open-air pond and the concrete box culverts in relation to the current treatment facility and adjacent properties may trigger a Site Plan Review by the Planning Division. According to the County's Zoning Code, a Site Plan Review is triggered by a development application or use that is allowed "by right", yet is subject to specific zoning standards. The proposed activity is considered "by right", but it may need a more

thorough review beyond a simple Zoning Clearance. In addition to Site Plan Review, construction of Option 2 would require a Grading Permit from the County's Building Division.

Environmental Requirements: Option 2 qualifies as a project under CEQA. Planning Division staff recommends the preparation of an initial study to determine whether the project will have a significant effect on the environment and what type of environmental document to prepare. Furthermore, based upon a cursory review of the preliminary site plan for Option 2, staff thinks that a Negative Declaration or Mitigated Negative Declaration may be adequate for the environmental review.

Construction Cost and Funding

The cost to implement Option 2 is composed of the cost to install a new open-air pond and a new below grade culvert storage system. There will also be associated piping, level sensors, pumps, aeration system, and SCADA system controls and the need to revise the Engineering Report and prepare the documents for the Waste Discharge Requirements.

The cost to build the below grade culvert storage system is quite high for the following reasons. 1) Most of the excess cost is due to space constraints. The area between the block wall and the edge of the recycled water pond is not wide enough to accommodate the less expensive method of using a stepped down trench. Thus, the trench will need to be shored and planked to allow safe working conditions down to a depth of about 15 feet. 2) The excavation will need to be brought back to grade using a slurry backfill rather than using the soil that was excavated during trenching, as there is not enough room for compaction equipment alongside the culvert. The excess soil will also need to be hauled off site.

The total estimated construction cost to implement Option 2 is $6,964,000. A loan to the CSA will most likely be needed to fund this option. There will also be ongoing operation and maintenance costs, along with the cost of saving for future replacements for this option. These ongoing annual costs are estimated to be $102,000. Refer to Table 2 for a breakdown of the construction costs.

Table 2

Estimated Costs for Option 2 Build Additional Emergency Storage		
Item	**Estimated Construction Cost**	**Estimated Increase in Ongoing Annual Costs[1]**
Storage Pond	$304,000	
Storage Vault	$3,981,000	
Subtotal	**$4,285,000**	
Contingency (30%)	$1,286,000	
Subtotal	**$5,571,000**	
Engineering, Construction Inspection & Admin. (25%)	$1,393,000	
Total	**$6,964,000**	**$102,000**

Notes:

1. Ongoing annual costs (currently $920,815) are for operation, maintenance, and replacements.

Summary of Advantages and Disadvantages

Advantages:

- Option 2 provides an easy and reliable diversion plan for the facility.
- The addition of long-term storage capabilities would allow the staff plenty of time (up to 20 days) to fix any problems and would allow for complete dewatering of the wastewater treatment plant for tank repairs such as recoating or rewelding.
- This option does not add a great deal of equipment that will need to be maintained in the future.

Disadvantages:

- A major disadvantage is the staff labor and time of up to 75 days, or longer that it would take to integrate the stored sewage back through the plant.

- Once the storage facilities have been filled, the facilities will not be fully available to handle any additional problems for an extended period of time.
- With this option, the existing wastewater treatment plant will be operating 24 hours per day, and 7 days a week which will further stress and limit the life of the facility.
- The foot print of the additional pond severely limits the equipment access to the wastewater treatment plant. The wastewater site is already experiencing issues with equipment access and turning radius, which is limiting the size of equipment that can be used at the site. Increased reduction of site access would exacerbate this existing problem.
- There is an increased chance of odor from storing sewage in the open-air pond for an extended period.
- This option is expensive due to the tight working constraints of the site.
- Recycled water will not be generated during a diversion to the emergency ponds.

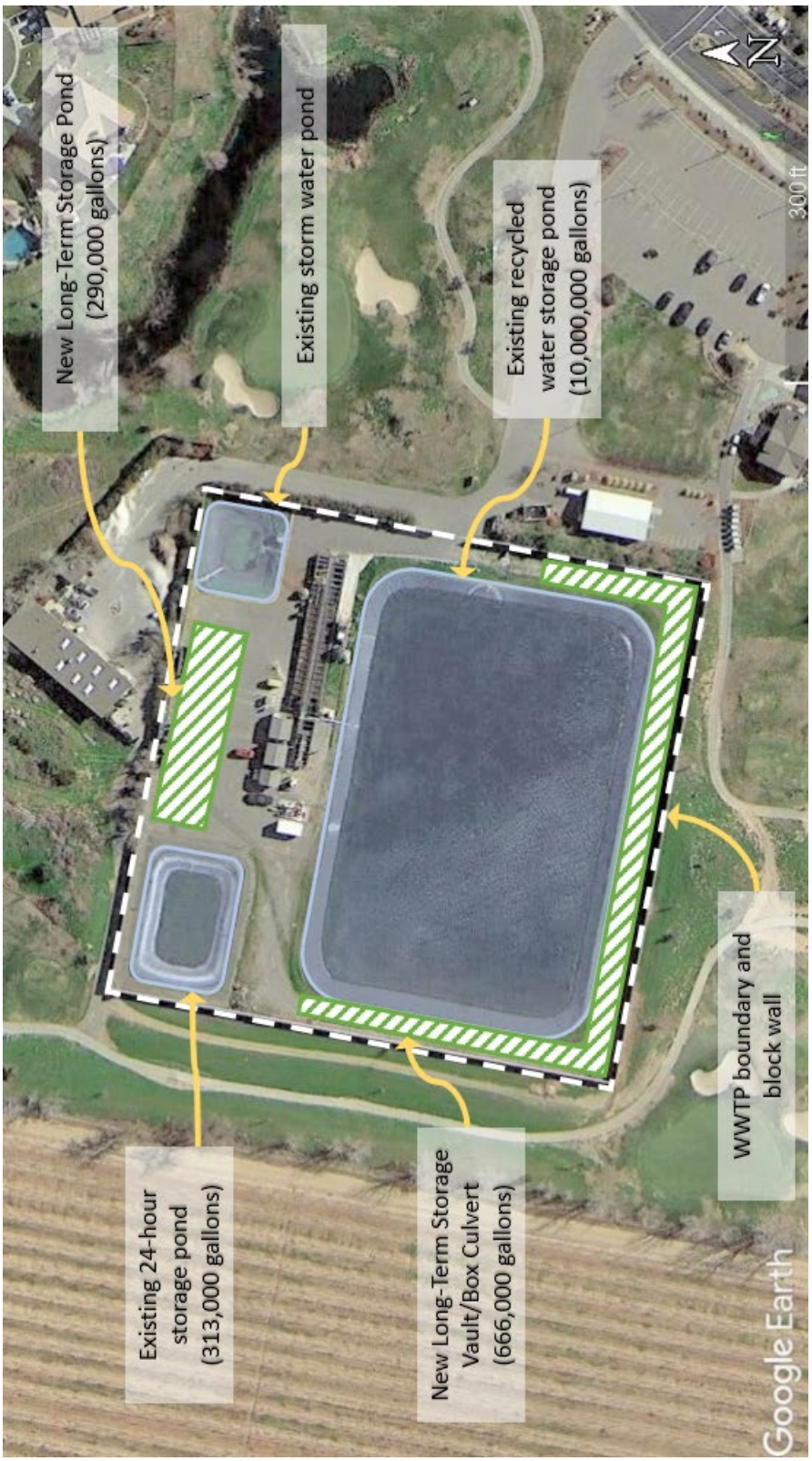

Figure 2
Option 2: Build Additional Emergency Storage

Option 3: Combination of Redundant and Standby Equipment

Description

Option 3 consists of the installation of a combination of redundant and standby equipment. The Title 22 code lists several different methods that may be used to achieve reliability for a wastewater treatment plant. Each treatment process within the plant may use a different method, such as extra storage for sewage, standby equipment, multiple process units, and automatic alarms, to achieve reliability. For purposes of this report, the following methods and associated equipment were chosen for each of the treatment processes.

Primary Treatment: The primary treatment unit consists of the equalization tank and an equalization pump. The reliability option chosen for this process entails the installation of a standby pump in the equalization tank. If one pump does not start, the second pump will automatically be called to start. This feature has been added during the recent plant rehabilitation and is already in operation.

A second emergency feature was also added to the plant during the rehabilitation. This feature consists of an emergency overflow pump that will pump excess sewage to the 24 hour emergency storage pond. This pump is automatically activated when flow reaches a high level in the equalization tank. A standby pump for this process has also recently been purchased and is ready for installation at the wastewater treatment plant.

Biological Treatment: The biological treatment portion of the facility is the aeration chamber. The equipment used in this treatment process consists of the aeration tank, 75 diffuser drop-pipes with 2 attached diffusers on each pipe, and a blower/motor to provide air to the system.

The reliability options for this process will consist of an alarm, short-term emergency storage, and standby replacement equipment. The standby equipment will consist of extra diffusers, and an extra blower/motor. The aeration system recently underwent a major rehabilitation with replacement of the aeriation piping, headers, valves, drop pipes, and diffusers. The standby diffusers have been purchased and are ready for installation when the current equipment fails. An alarm and 24 hour emergency storage are also in place. A standby blower/motor is in the process of being purchased.

Secondary Sedimentation: Secondary sedimentation takes place in the clarifier unit. The clarifier unit is composed of a tank, 4 air lift pumps, and a blower/motor that provides air for the pumps. The reliability equipment option chosen for the clarifier is a standby blower/motor. The blower/motor that is used for the airlift pumps is the same unit that is used for the aeration system. As mentioned above, this unit is in the process of being purchased.

Coagulation: The coagulation process takes place in a unit called a Flash/Floc tank. Title 22 calls for the following mandatory features: standby feeder, adequate chemical stowage and

conveyance facilities, adequate reserve chemical supply, and automatic dosage control. In addition, reliability equipment must also be included.

The reliability equipment options chosen are the use of an alarm, short-term emergency storage, and standby replacement equipment. The coagulation system is currently being rehabilitated at the wastewater treatment plant. Once the work has been completed all of the listed requirements above will be met.

Filtration: The filtration facility is composed of 3 tank sections, 2 duel media (sand and anthracite) cells, a clearwell, 2 clearwell pumps, a mudwell, 2 mudwell pumps, 2 air scour systems activated by floats, and a blower that provides air for the backwash. The filtration process for the facility is one of the more critical portions of the plant. If one component within this process fails to operate, the facility will likely lose the ability to meet the requirements for recycled water so that it can be safely disposed of on the golf course.

Thus, the reliability equipment chosen for this process is an alarm and a complete second filtration unit to be utilized as a standby that is capable of treating the entire flow with one unit not in operation. The second unit may also be used in combination with the first unit to reduce the loading on both units and thus preserve the filter media for a longer time, which will result in reduced filter media replacement costs.

Disinfection: The equipment for the disinfection process consists of a tank, a chlorination unit which provides the disinfectant, and a chlorine analyzer to determine compliance with the regulations. Title 22 states that the following features are mandatory: a standby chlorine supply, manifold system to connect chlorine cylinders, chlorine scales, and automatic devices for switching to full chlorine cylinders. The facility currently uses a large chlorine storage tank with a level indicator so that multiple chlorine cylinders, a manifold system, scales, and switching devices are not needed.

The selected reliability features are an alarm, short-term 24 hour emergency storage, and standby replacement equipment. The standby equipment will consist of a standby chlorine metering pump and tubing.

Refer to Figure 3 for the location of the filter and new storage facility for the standby equipment.

Operation Reliability

The addition of a second filtration and disinfection unit will greatly add to both the ease and reliability of running the plant. Having alarms and standby equipment for the other processes does not necessarily provide additional ease in day to day operations of the system. However, it does provide increased reliability as the staff is able to replace broken equipment at a moment's notice.

This option provides redundancy for the filter, which is the most critical portion of the plant, and reliability for the remainder of the plant in the form of standby equipment.

However, when the plant needs to be taken off-line for more extensive repairs and rehabilitation, then temporary equipment (large tanks, temporary pumps, temporary aeration, temporary power, temporary alarm systems, and temporary reprograming of the SCADA system to be able to automatically operate the plant at night when staff is not on-site, etc.) will need to be rented and set up onsite to take the place of the portions of the plant that need to be taken off-line. Renting, assembling, and operating these temporary systems can be costly and need some lead time to be able to get them up and running prior to taking the plant off-line. It is estimated to cost on the order of $300,000 each time the front half of the plant needs to be taken off-line. It is estimated that the plant should be taken off-line for coating maintenance and welding inspections about every 5 to 7 years. If the plant experiences an emergency and needs to be taken off-line with little warning, then the ability to meet the permit requirements for discharge may be affected.

Recycled Water Production

The ability to consistently produce recycled water for the golf course increases with this option, due to the presence of the second filtration unit. The total amount of recycled water produced by the wastewater treatment plant will remain the same, with implementation of this option.

Management

With the selection of standby equipment and the addition of a second filtration unit, the operation and management of the wastewater treatment plant would remain under the jurisdiction of Yolo County.

Regulatory Considerations

State Requirements: Option 3 would require obtaining a new operating permit from the RWQCB in conjunction with the DDW.

Local Requirements: Similar to Option 2, a Site Plan Review may be required by the Planning Division based on the location of the equipment in relation to the existing sewage treatment plant and adjacent properties. Also, Option 3 would require a grading permit and a building permit from the County's Building Division.

Environmental Requirements: Like Options 1 and 2, Option 3 qualifies as a project under CEQA. Planning Division staff recommend the preparation of an initial study to determine whether the project will have a significant effect on the environment and what type of environmental document to prepare. Moreover, staff presume that a Negative Declaration or Mitigated Negative Declaration may be sufficient for the environmental review based on their cursory review of the site plan for Option 3.

Construction Cost and Funding

The cost to implement Option 3 is primarily the cost of providing and installing a second filtration unit. There is space to install a second unit adjacent to the existing filter. The recent upgrade of the wastewater treatment plant SCADA system considered the possibility of needing a second filtration unit and so there is space allocated in the existing panels for the future equipment. There will be associated computer programing costs for the SCADA system.

The total approximate construction cost to implement Option 3 is $725,000. There may be an additional $300,000 in temporary equipment costs every 5 to 7 years. Ongoing operation, maintenance, and future replacement costs are at about $75,000 per year.

There is a possibility that a loan and its associated costs would not be needed, and rather the CSA could fund this option by drawing on reserves or saving for the funds needed for construction. Refer to Table 3 below for more detail on the construction costs.

Table 3

Estimated Costs for Option 3 Build a Combination of Redundant and Standby Equipment		
Item	**Estimated Construction Cost**	**Estimated Increase in Ongoing Annual Costs[1]**
Filter & Disinfection Unit (101,000 gpd)	$357,000	
Yard Piping	$15,000	
Blower	$9,000	
Control & Instrumentation	$47,000	
Diversion From Aeration to Emergency Pond	$18,000	
Subtotal	**$446,000**	
Contingency (30%)	$134,000	
Subtotal	**$580,000**	
Engineering, Construction Inspection, & Admin. (25%)	$145,000	
Total	**$725,000**	**$75,000**

Note:

1. Ongoing annual costs (currently $920,815) are for operation, maintenance, and replacements.

Summary of Advantages and Disadvantages

Advantages:

- The combination of both redundant and standby equipment is an attractive option, because almost all of the standby equipment that is required by Title 22 is already in place due to the recent rehabilitation of the plant.
- A redundant filter will greatly increase the reliability of producing recycled water within the permit requirements on a consistent basis.
- This option does not reduce the work space or turning radius for truck and equipment traffic within the wastewater treatment plant site.
- The cost to provide redundancy and reliability is reasonable for the advantages gained.
- Recycled water will continue to be generated for on-site use by the golf course.

Disadvantages:

- Crews will need some time to install new equipment when there is a failure versus having a completely redundant second wastewater treatment plant available and ready to go.
- Temporary equipment will need to be rented and set up onsite to take the place of the portions of the plant that need to be taken off-line for major work. In emergency situations, there may be a time delay of up to several days to be able to get temporary equipment on-site and operating. This may lead to a temporary loss of ability to meet the State water quality requirements.
- The existing primary and secondary portions of the wastewater treatment plant will be operating 24 hours per day, and 7 days a week which will further stress and limit the life of the facility.

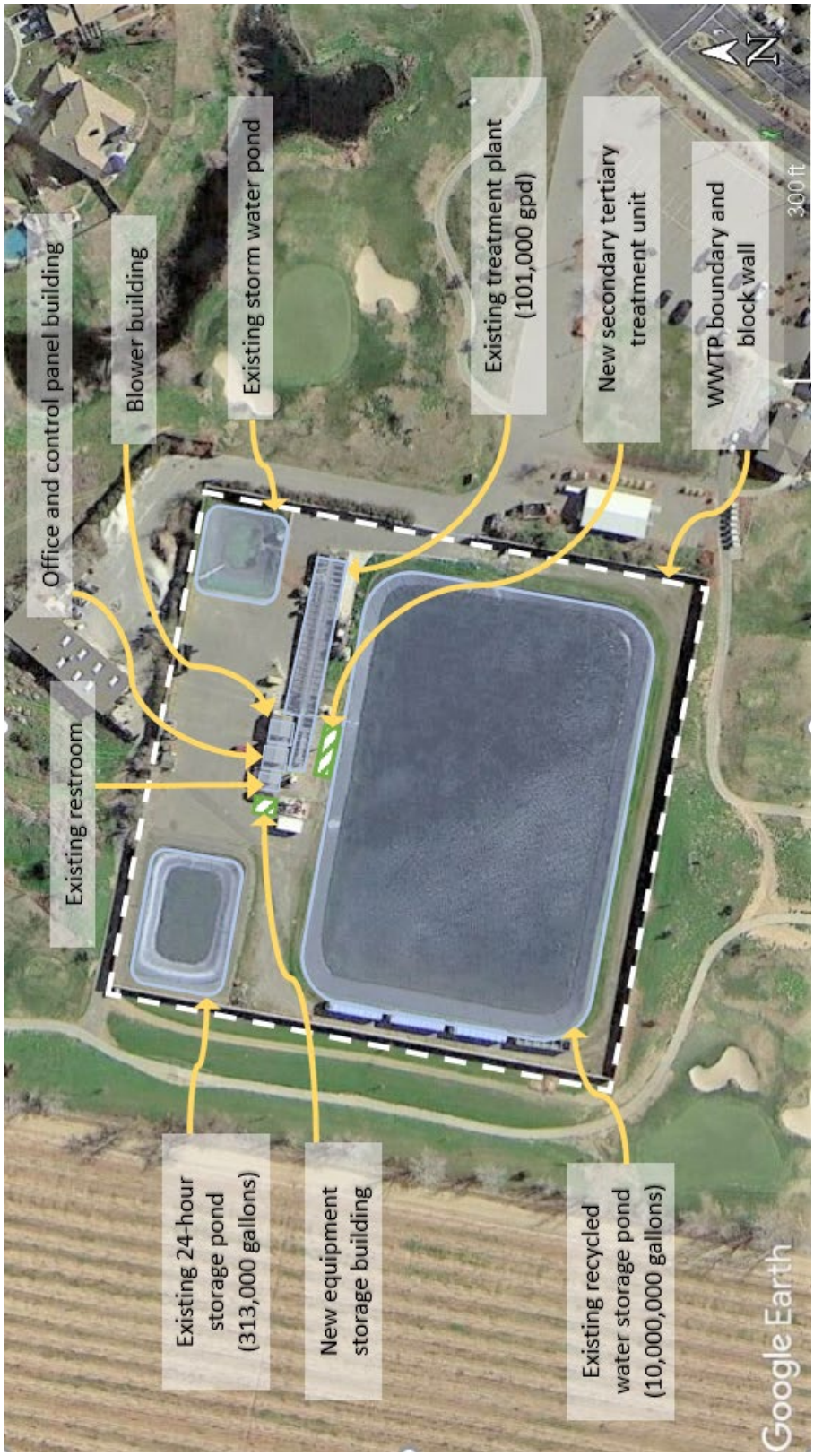

Figure 3
Option 3: Combination of Redundant and Standby Equipment

Option 4: Build A Smaller Plant

Description

Option 4 consists of building a smaller capacity duplicate of the wastewater treatment plant that currently exists at the site. The new treatment plant would be designed for about 60,000 gallons per day (gpd), which is about 9 percent over the existing average flow rate of 55,000 gpd. As previously mentioned the current plant is rated for a flow of 101,000 gpd.

The new plant would have a footprint of approximately 13 feet in width and would be 165 feet long. The existing plant has a footprint of 24 feet in width and is 165 feet in length. Due to the new plant having a narrower footprint it would fit adjacent to the south side of the existing plant. Refer to Figure 4 for a proposed layout of the smaller plant.

Operation Reliability

The operation of a smaller second plant would take place in a similar manner to Option 1 (Building a Plant the Same Size as the Existing). Again, the second plant would be utilized routinely in conjunction with the primary plant on an alternating basis. Alternating the use of the plants will keep all of the equipment operational, and allow for eyes-on inspections of portions of the plant that are habitually underwater.

In addition, the second unit would be operated whenever maintenance that required removing all the incoming wastewater from the plant was needed, such as for recoating operations of the tank, or welding inspections. Thus, with the one unit off-line, all wastewater would be handled by the alternate unit until work on the first unit was completed and placed back into operation.

Recycled Water Production

The amount of recycled water that is produced by the wastewater treatment plant each year will not change with the building of a second smaller plant. However, as is also the case with Options 1 and 3, having a second filter improves the reliability of being able to consistently provide high quality water to the golf course.

Management

The operation and management of the wastewater treatment plant would remain under the jurisdiction of Yolo County, if the construction of a smaller second unit was the chosen option.

Regulatory Considerations

State Requirements: Option 4 would require obtaining a new operating permit from the RWQCB in conjunction with the DDW.

Local Requirements: The construction of Option 4 is of a lesser scale than Option 1. However, a Site Plan Review may be required by the Planning Division based on the location of

the smaller treatment plant in relation to the existing facility and adjacent properties. Also, Option 4 would require a building permit from the County's Building Division.

Environmental Requirements: Option 4 qualifies as a project under CEQA. Planning Division staff recommends the preparation of an initial study to determine whether the project will have a significant effect on the environment and what type of environmental document to prepare. Furthermore, based upon a cursory review of the preliminary site plan for Option 4, staff thinks that a Negative Declaration or Mitigated Negative Declaration may be adequate for the environmental review.

Construction Cost and Funding

The cost to implement Option 4 in comparison to Option 1 (Build a Second Plant the Same Size as the First Plant) is less expensive which can be accounted for by the difference in size. This option is also less expensive because it can be situated immediately adjacent to the existing plant, which reduces piping, power, and pumping costs. An Engineering Report and Waste Discharge Requirements will need to be generated.

Funding for this option may be able to be obtained through a combination of the CSA reserves and through saving in advance for the monies needed for construction. Alternatively, a loan may be obtained.

As with Option 1 (Build a Second Plant the Same Size as the First Plant), there will be ongoing operation and maintenance costs, along with the cost of saving for future replacements for this option. These ongoing annual costs are estimated to be $83,000.

The total approximate construction cost to implement Option 4 is $2,249,000. Refer to Table 4 below for more cost details.

Table 4

Estimated Costs for Option 4 Build a Second Smaller Plant		
Item	**Estimated Construction Cost**	**Estimated Increase in Ongoing Annual Costs[1]**
Treatment Plant (60,000 gpd)	$829,000	
Yard Piping	$41,000	
Blowers & Blower Building	$132,000	
Modify Existing Sludge Press	$30,000	
Control & Instrumentation	$352,000	
Subtotal	**$1,384,000**	
Contingency (30%)	$415,000	
Subtotal	**$1,799,000**	
Engineering, Construction Inspection, & Admin. (25%)	$450,000	
Total	**$2,249,000**	**$83,000**

Note:

1. Ongoing annual costs (currently $920,815) are for operation, maintenance, and replacements.

Summary of Advantages and Disadvantages

Advantages:

- This option provides great flexibility for both the operation and maintenance activities at the plant.
- The smaller width of the new plant results in the ability to place it immediately adjacent to the existing plant which reduces both the construction and operational issues, as compared to Option 1 (Building a Plant the Same Size as the Existing Plant).
- The construction will be less complicated than Option 1 (Building a Plant the Same Size as the Existing Plant), because the head of both plants will be situated next to each other reducing the need for extensive plumbing and trenching across all the existing piping and electrical conduits that are on site. The new plant would also

be able to utilize gravity flow for the entire process in comparison to Option 1 which will require pumps to move the sewage from one process to the next.

- The ability to use gravity to move the sewage through the processes reduces costs for power, pump replacement, and operational issues resulting from pump failures.
- This option does not reduce the equipment access for the existing emergency storage pond or storm water pond.
- The cost to implement Option 4 is favorable in comparison with Option 1. Both options provide a completely redundant facility, but Option 4 has a lower cost as the plant will be sized to match the actual existing flows, rather than the higher theoretical flow rates that were used to design the original facility. Note that theoretical flow rates were used to size the original plant because the housing for the community had not been constructed yet and so estimations had to be used for design.
- Recycled water will continue to be generated for on-site use by the golf course.

Disadvantages:

- Similar to Option 1, a complete second set of equipment will need to be maintained which will slightly increase future operational and maintenance costs. Future Capital expenditure costs (reserve costs) for a second set of equipment will largely be offset because both sets of equipment will be running about half the time.
- A new building will need to be constructed to house the additional blowers and motors.

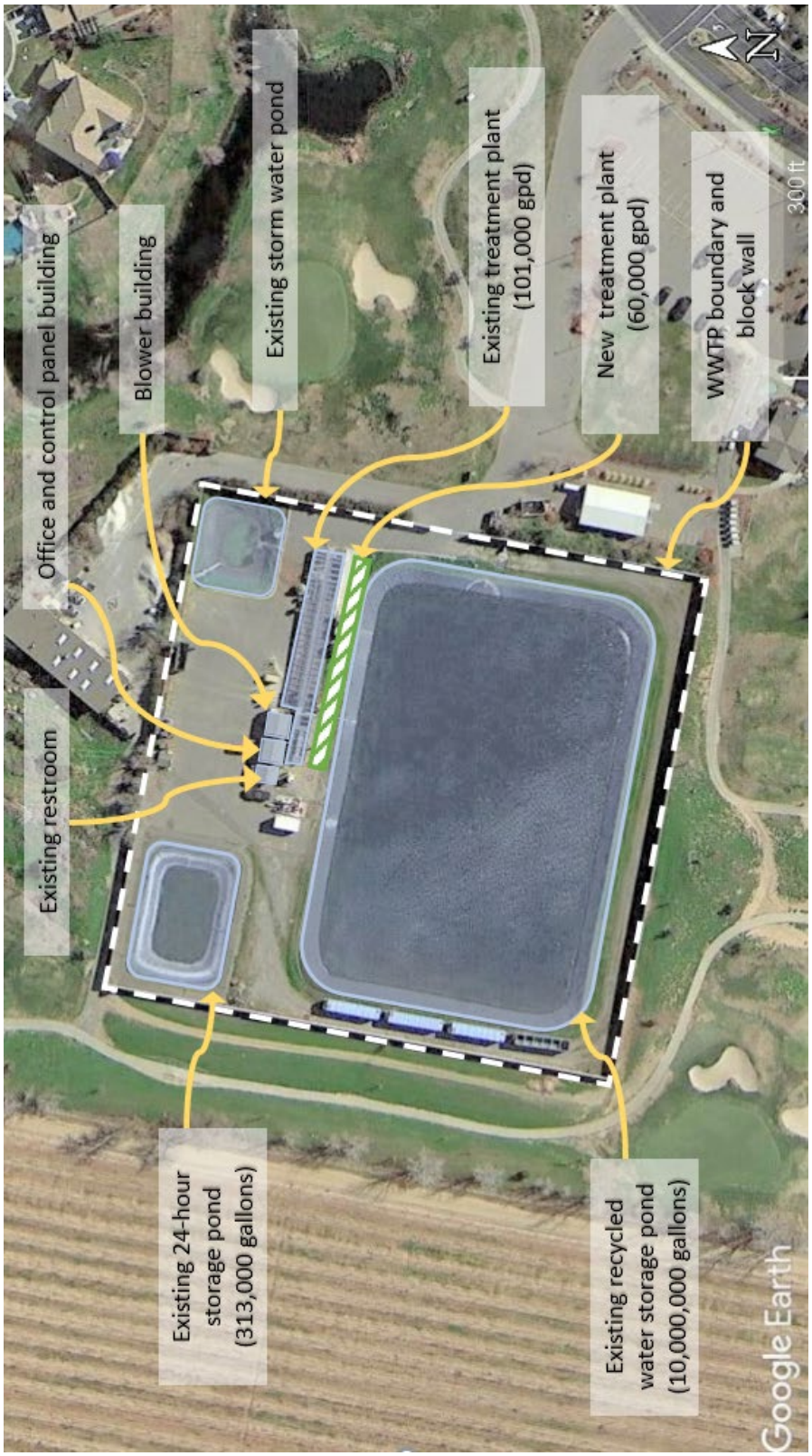

Figure 4
Option 4: Build A Smaller Plant

Option 5: Connection to Woodland

Description

Option 5 consists of connecting the Wild Wings community to the City of Woodland's sewage system with an approximately 5.2 mile long pipeline. The pipe alignment would begin at the Wild Wings wastewater treatment plant, then turn south along Wildwings Drive, east along Highway 16, south along Road 94B, east along Road 24, and would terminate at a City manhole located near the intersection of Gibson Road and Road 98. Once the Wild Wings sewage arrives at the City manhole it would flow to the City's Water Pollution Control Facility for processing and treatment. Refer to Figure 5 for the proposed alignment of the pipeline to Woodland.

The following assumptions are made for purposes of this report. The force main will be 8 inches in diameter, will be constructed of High-Density Polyethylene (HDPE), and will be installed utilizing directional drilling rather than using an open trench method. The use of directional drilling allows the pipeline to be installed underground without disturbing the roadway, shoulder, culverts, and driveways situated above. Directional drilling also limits the amount of construction equipment along the alignment, thus reducing the impacts to local traffic.

The two existing pump stations that are located in the Wild Wings community will continue to be utilized with this option. An additional pump station will need to be constructed in order to pump the sewage to Woodland. The new pump station will be situated at the Wild Wings wastewater treatment plant site where there is adequate room for expansion. There is a possibility of retrofitting the existing equalization tank for use as the new pump station. The influent screen that was recently purchased for the Wild Wings facility can also be relocated and used in the future with this option. Use of the screen will reduce the potential for clogging of the pipeline to Woodland. Refer to Figure 6 for the proposed location of the new pump station.

Reliability features will need to be included with this option to handle the sewage in the case of a power outage, pump failure, or pipeline blockage. The existing Wild Wings plant has a back-up generator that will be able to provide the power needed to operate all 3 pump stations and the screen in the event of a power outage. Standby pumps will need to be purchased for all three pump stations so that if a pump breaks the City crews can quickly install another in its place. The existing 24 hour emergency pond will continue to be utilized to temporarily store sewage in the event of pump failures, a pipeline blockage, or the need for routine maintenance that requires the pipeline to be out of service temporarily. All of these reliability features are already in place with the exception of 1 standby pump for the new pump station.

The remaining components of the wastewater treatment plant would need to be decommissioned for an undetermined cost. The yard and the office would still be maintained at the wastewater treatment site because it is also utilized by the water system which will remain under the management of Yolo County.

The State prefers that small communities be regionalized into larger more efficient facilities. If Esparto or Madison wanted to regionalize sometime in the future, the decommissioned plant at Wild Wings might be an option for the City of Woodland to consider.

Operation Reliability

The ease of handling the Wild Wings sewage will be greatly increased with this option as it will become a small portion of a much larger volume that is treated at the City's facility. The City treats about 5 million gallons each day as compared to the average of 55,000 gallons per day that is treated at Wild Wings.

The reliability of this option would be improved as there would be increased redundancy of equipment, extra facilities to handle the sewage, and more specialized staff to address any complications. Thus, this option provides excellent ease of operation and reliability for the Wild Wings community.

Recycled Water Production

Recycled water would no longer be produced at Wild Wings for use on the golf course if this option were implemented. The amount of recycled water used by the golf course, which is about 21 million gallons per year, would need to be replaced by either surface water from Moore Canal or ground water from the Wild Wings domestic wells. The RWQCB stated during recent discussions, that they do not favor the option of using additional ground water to take the place of recycled water.

Yolo County Flood Control and Water Conservation District (YCFC & WCD) has stated that they can provide surface water from Moore Canal for use by the golf course during the summer months. A pump station and about 3,000 lineal feet of pipeline would need to be constructed to pump water from Moore Canal to the golf course's irrigation wet well, which is located at the Wild Wings wastewater treatment plant. A filter system would need to be operational at the golf course's wet well to reduce the amount of sediment present in the Moore Canal water prior to it being pumped into the irrigation system. The existing filter system for the golf course is currently being rehabilitated and will be ready for operation by the fall of 2018. Power would also need to be extended about 3,000 lineal feet from the wastewater treatment plant to Moore Canal to operate the pump station.

Water from the Moore canal is not always available during drought years. It might be possible to pump water from the canal during the rainy season when the canal is used to transport storm drainage water.

Management

The operation and management of the wastewater treatment plant would change from Yolo County to the City of Woodland if the connection to Woodland were the selected option. In addition, the City would take over the operation and maintenance of the Wild Wings collection system (which is all of the manholes and sewer pipes located in the streets), and the two pump stations. Thus, with this option the entire facility would be turned over to the City, not just the treatment of the sewage. Refer to Figure 7 to see the entire wastewater collection and treatment system for which the City would assume responsibility.

The County of Yolo administers several County Service Areas (CSAs) within its region. However, Wild Wings is the only CSA where Yolo County is responsible for, operates, and manages a wastewater treatment facility. Outside of the CSA program, the County is not responsible for any wastewater treatment facilities, and therefore, does not have staff with the necessary expertise and must rely on contract operators.

The City of Woodland (City) operates and manages their wastewater treatment plant (Woodland Water Pollution Control Facility) for the population of the entire city. The City's facility is rated for 10.4 million gpd of sewage, and they are currently treating about 5 million gpd. Thus, the City plant has the capacity to treat the 55,000 gpd of sewage generated by the Wild Wings community.

The City plant currently has a staff of 13.5 people consisting of plant operators, electricians, instrument technicians, and mechanics. The Wild Wings plant is run with 2.5 operators. Whenever mechanical, electrical, or instrumentation issues arise that are outside the operators' expertise, then off-site subcontractors are called in to assist. Response times to problems are sometimes delayed as the Wild Wings operators are reliant on subcontractors' availability.

The City plant also has an on-site laboratory which is used to perform tests. The Wild Wings wastewater treatment plant does not have an extensive in-house laboratory and sends samples daily to an outside lab for processing. Using an outside laboratory results in the Wild Wings staff having a longer turn-around time to receive results, and to be able to make timely changes to the wastewater process.

Regulatory Considerations

State Requirements: The implementation of Option 5 would remove the requirements from Yolo County to renew the existing operating permit from the Regional Water Quality Control Board for the Wild Wings community. The State Water Resources Control Board stated that if a connection to the Woodland Water Pollution Control Facility was made, then they would deactivate the permit that is held by Yolo County. In addition, the sampling and reporting requirements, the maintenance of operational records, and the payment of the annual fee would

all be lifted from Yolo County. Concurrently, these obligations would be transferred to the City of Woodland.

Local Requirements: A Site Plan Review may be required by the Planning Division based on the location of the retrofit lift station and screen in relation to the existing facility and adjacent properties. Also, Option 5 would require a building permit from the County's Building Division and a Grading Permit. Traffic control along the county roads and Highway 16 will be required during construction.

Environmental Requirements: Option 5 qualifies as a project under CEQA. Planning Division staff recommends the preparation of an initial study to determine whether the project will have a significant effect on the environment and what type of environmental document to prepare. Furthermore, based upon a cursory review of the preliminary site plan for Option 5, staff thinks that a Mitigated Negative Declaration or Environmental Impact Report may be adequate for the environmental review.

California Department of Transportation (CalTrans): The development of Option 5 would entail the construction of a portion of the pipeline alongside Highway 16 for a distance of about 3,000 feet. One highway crossing would also be needed. Caltrans will require permits, signage, and traffic control during the construction.

Environmental Requirements: Option 5 qualifies as a project under CEQA. Planning Division staff recommend the preparation of an initial study to determine whether the project will have a significant effect on the environment and what type of environmental document to prepare. Furthermore, based upon a cursory review of the preliminary site plan for Option 5, staff think that a Negative Declaration or Mitigated Negative Declaration may be adequate for the environmental review.

Local Agency Formation Commission

A meeting with the Local Agency Formation Commission (LAFCo) took place as part of the research for this report.

LAFCo stated that they are concerned about the potential for "growth inducing" projects within the county. However, they determined that providing sewage treatment services to a community that already has sewage treatment services is not considered to be "growth inducing". LAFCo staff stated that the following exception applies to the Wild Wings community.

> *"Contracts or agreements solely involving two or more public agencies where the public service to be provided is an alternative to, or substitute for, public services already being provided by an existing public service provider and where the level of service to be provided is consistent with the level of service contemplated by the existing service provider."*

This exception is noted under Section 3.1 (c) of Yolo LAFCo Project Policies, adopted January 28, 2016.

In summary, LAFCo approval is not necessary for the Connection to Woodland option as it falls under the exception detailed above.

Voter Initiative

The City of Woodland has an Urban limit Line which surrounds the City. The urban limit line defines the area where development and services for the City of Woodland are allowed. The urban limit line initiative currently contains the following language:

"Public services and facilities shall not extend beyond the permanent urban limit line."

The Wild Wings community does not fall within the Woodland permanent urban limit line. Therefore, the City has determined that in order to provide sewage treatment services to Wild Wings, a new urban limit line initiative will need to be placed on a ballot. The residents of Woodland will need to approve the inclusion of Wild Wings within the urban limit line in order for Wild Wings to be able to connect to the City of Woodland. Refer to Figure 5 for the City of Woodlands current Urban Limit Line.

Construction Cost and Funding

The cost to implement Option 5 is the combination of the costs for the design and construction of a pipeline to Woodland, a new pump station, a new water source for the golf course, and the City of Woodland initiative costs, and connection fees.

Pipeline Costs: Costs to furnish and install about 28,000 lineal feet of 8 inch HDPE pipeline, including appurtenances, and using directional drilling methods is about $95 per lineal foot. Thus, the cost of the pipeline is on the order of $2.7 million. Patch paving of the access locations along the pipeline alignment will also be required. The costs for both the pipe materials and the asphalt paving will be subject to future fluctuations due to changes in oil prices and tariffs.

Pump Station: Expenses to retrofit the existing equalization tank and screen for use as the pump station to Woodland are estimated to be $120,000.

Golf Course Replacement Water: The cost for design and installation of about 3,000 lineal feet of 10 inch PVC pipe, a pump station located at Moore Canal, and the extension of underground power from the wastewater treatment plant to the Moore Canal are on the order of $545,000.

The current price of the YCFC & WCD water is about $66 per acre-foot. The golf course will need to supplement about 21 million gallons each year which equates to about 65 acre-feet. Thus, the annual cost to the golf course for the replacement water will be about $4,300 per year, not including future price adjustments.

If the golf course stops using both ground water and recycled water, and instead only uses surface water from Moore Canal for all of its irrigation needs, then their cost for the use of the ground water system will drop significantly. Conversely, the costs for the ground water system for the residents of Wild Wings will increase as the operating costs will be spread over a smaller group of payers. Currently the golf course is paying about 41.4% ($225,152/year) of the total cost of the water system and the residents pay for the remaining 58.6% ($318,693/year or $943/household). It is estimated that the cost for water will increase by about $660/year for each household if the golf course is able to use surface water from Moore Canal for all of their irrigation needs.

Initiative: The City of Woodland will need to place a voter initiative on the ballot for approval to extend sewage services to the Wild Wings community. The next general election is not scheduled until November of 2020. A special election in 2019 may be required given the time constraints. Special election costs may range from $200,000 to $300,000. Additional monies may be needed to provide information about the issue for the residents of Woodland. For purposes of this report, informational items are estimated at $50,000. In order for the initiative to pass, 50% plus 1 vote will be needed for the Wild Wings CSA to move forward with this option.

City of Woodland Connection Fee: The City of Woodland will levy a one-time-only fee to connect to their system. The current fee is $6,663, which will be assessed to each homeowner (338 homes) and the golf course for a total of $2,258,757. This fee may rise in the future.

City of Woodland Sewage Rates: The City of Woodland currently charges a flat rate of $62.15/month ($745.80/year) per single family home in 2018. These rates may be adjusted in 2019.

Total Cost: The total approximate up-front cost, including contingencies to implement Option 5 is $9,719,000.

There will also be ongoing operation and maintenance costs, along with the cost of saving for future replacements for this option. These costs will include, in part, the City of Woodland flat sewer rate and the City of Woodland operation, maintenance, and replacement costs for the facilities that are unique to Wild Wings (collection system, emergency facilities, and pipeline and pump station to Woodland). These ongoing annual costs are estimated to be $572,000/year.

The Wild Wings Golf Course will incur additional costs, which are unknown at this time, for the operation of the wet well and the pump station used to irrigate the golf course. The wet well and pump station are currently used to dispose of recycled water on the golf course. With the implementation of Option 5 there will no longer be recycled water and the costs of operating and maintaining the pump station will shift from the wastewater treatment plant to the golf course. Additionally, the golf course will need to operate, maintain, and save for future replacement costs for the new pipeline and pump station required to use Moore Canal surface water. Collectively, this may result in a need to increase the golf course special tax that is paid by the Wild Wings property owners.

Refer to Table 5 for a summary of the upfront, construction, and annul costs for Option 5 (Connection to Woodland).

Table 5

Estimated Costs for Option 5 Connection to Woodland		
Item	**Estimated Construction Cost**	**Estimated Ongoing Annual Costs[1]**
Pipeline (29,000 lf)	$2,660,000	
Retrofit for Lift Station	$120,000	
Golf Course Replacement Water	$545,000	
Patch Paving	$47,000	
Connection fees to Woodland	$2,259,000	
Initiative Costs	$350,000	
Subtotal	**$5,981,000**	
Contingency (30%)	$1,794,000	
Subtotal	**$7,775,000**	
Engineering, Construction Inspection, & Admin. (25%)	$1,944,000	
Total	**$9,719,000**	**$572,000**

Note:

1. Ongoing annual costs are for operation, maintenance, and replacements of the facilities that are unique to Wild Wings (the collection system, emergency facilities, and pipeline and pump station to Woodland) and the City of Woodland flat rate sewer fee. There will also be costs, which are unknown at this time, for the loss of recycled water and the need for the golf course to use surface water.

Summary of Advantages and Disadvantages

Advantages:

- A higher level of reliability will be realized for the community by pumping the sewage to the City of Woodland for treatment.
- The switch to the City of Woodland management team is an advantage with their greater levels of in-house staff and expertise, and with their efficiency of scale.
- This regionalization option is preferred by the Regional Water Quality Control Board and the State Water Resources Control Board who are responsible for permitting the wastewater treatment plant.

Disadvantages:

- This option is dependent on the City of Woodland residents' approval of a ballot initiative.
- If the ballot initiative fails, then that time and money is lost, and work would then need to begin on a second alternative.
- This option results in the loss of recycled water for the irrigation needs of the golf course and an alternative water supply will need to be developed. These infrastructure needs may require an increase in the golf course special tax which will require a two-thirds vote of support from the Wild Wings property owners.
- The construction costs are the highest of all the alternatives studied.
- The State loan process is time consuming and the rules related to the distribution of funds may be in the process of changing to be less advantageous to the Wild Wings community as Wild Wings is not a disadvantaged community, and the problem is not a clean water issue.

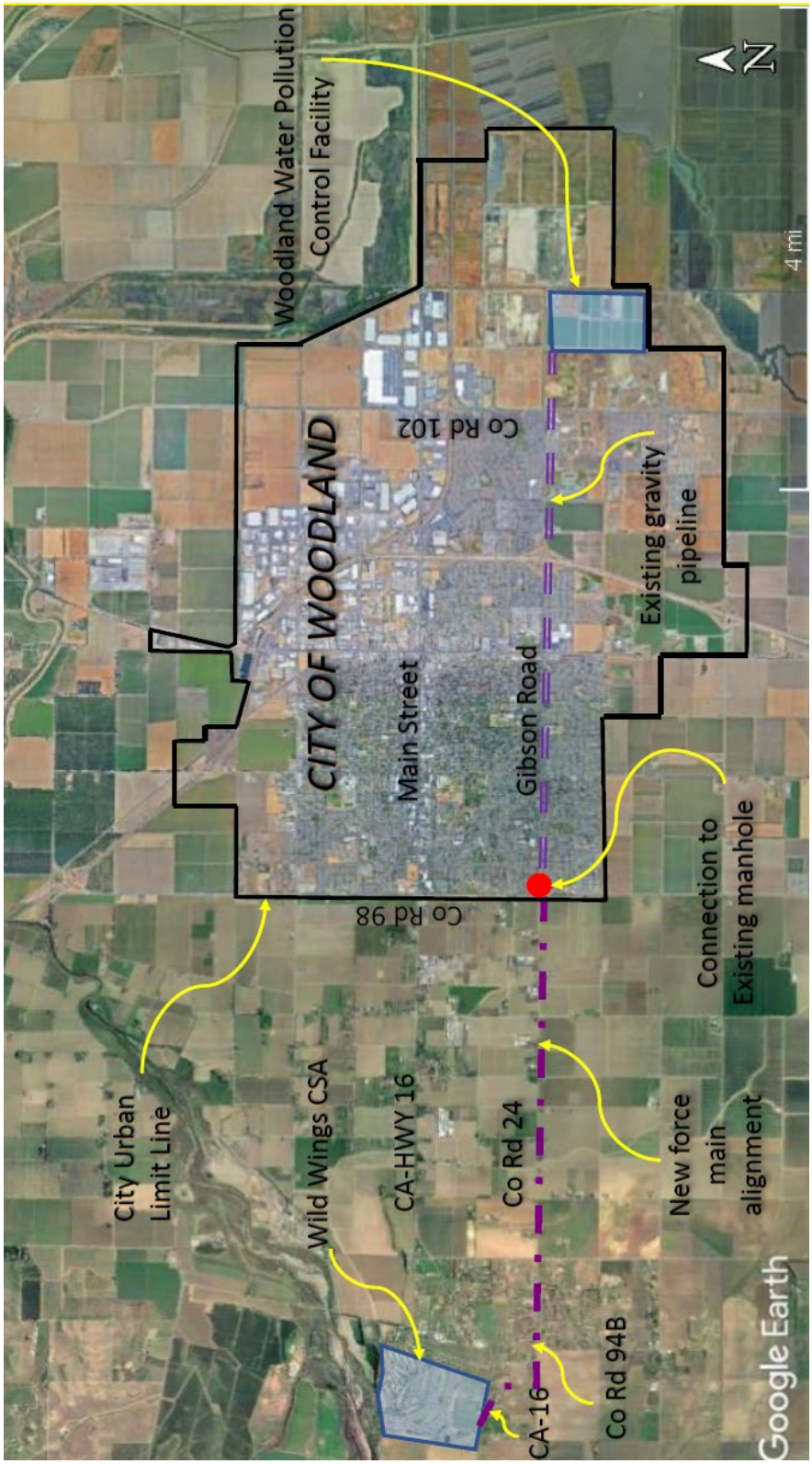

Figure 5
Option 5: Connect to Woodland – Pipeline Alignment & Urban Limit Line

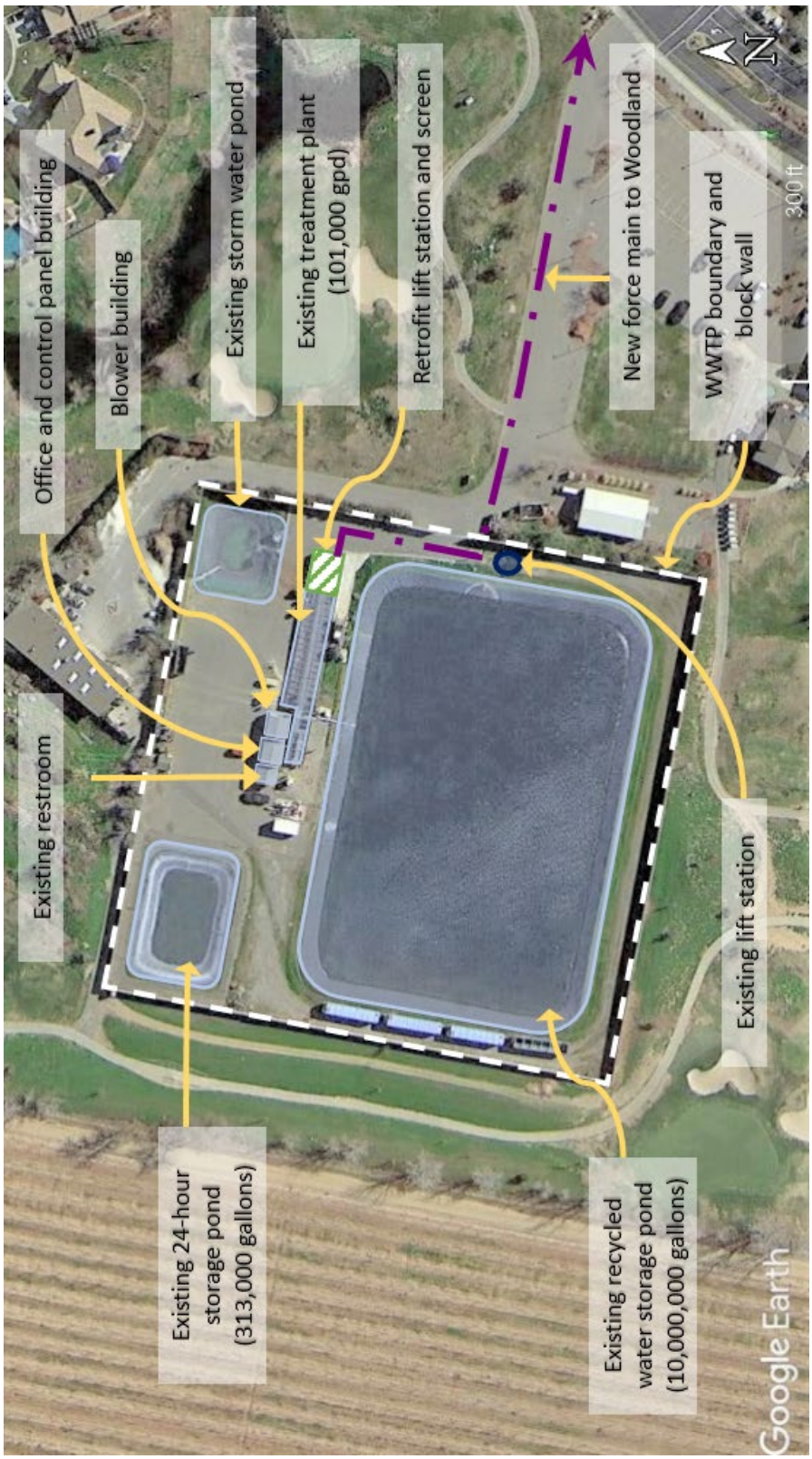

Figure 6
Option 5: Connect to Woodland – New Pump Station

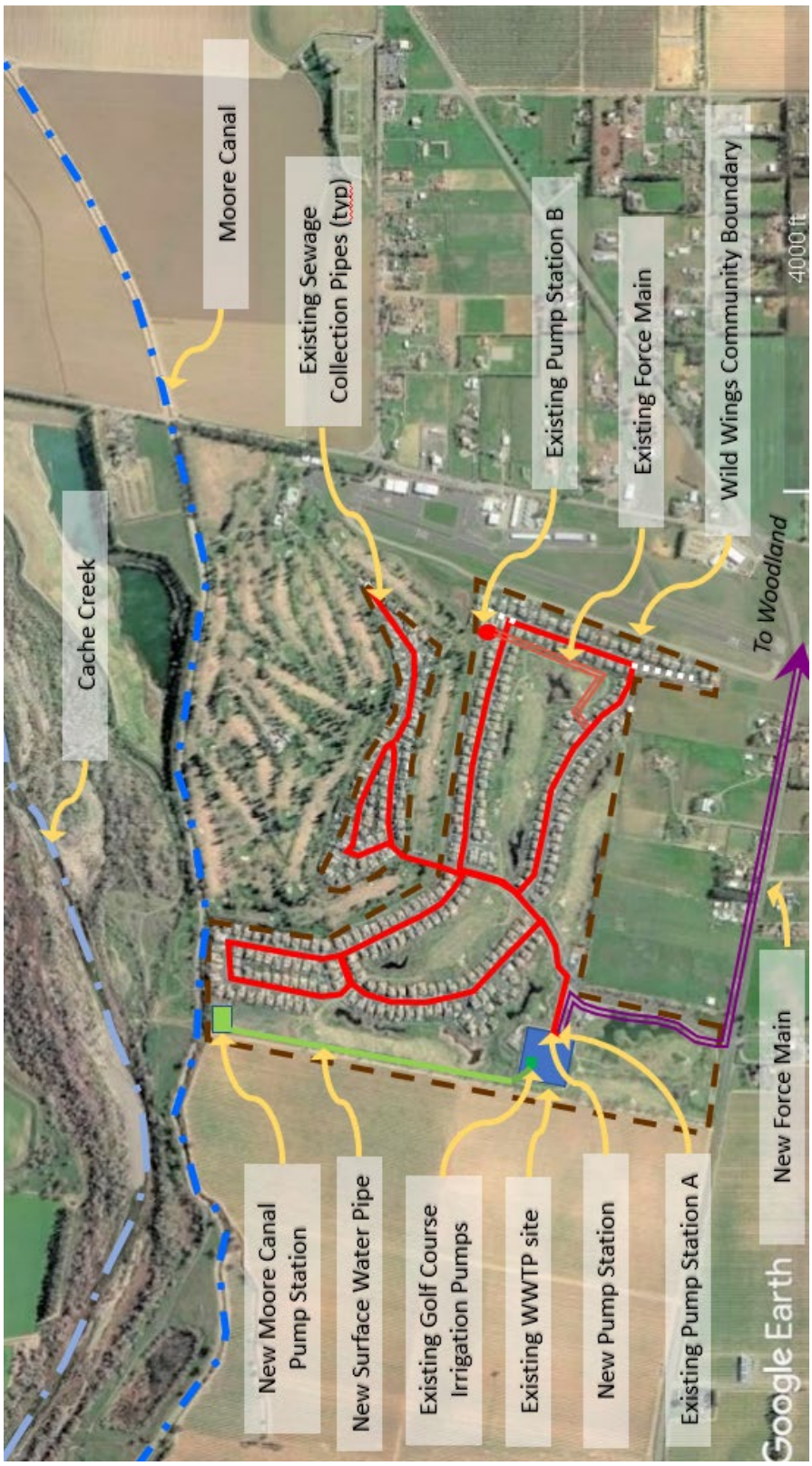

Figure 7
Option 5: Connect to Woodland – Wastewater Facilities to be Turned Over to Woodland

Option 6: Do Nothing

Description

Feasibility studies often consider not investing in the project as an option to be explored, and that option is known as the "Do Nothing" option. For this study, the option of not providing any further reliability or redundancy equipment was reviewed.

Title 22[6] requires that wastewater treatment plants have a prescribed amount of reliability and or redundancy. Reliability and redundancy are safeguards used to provide consistent and effective treatment of the wastewater, and to protect people and the environment that may come into contact with the water.

Regulatory Considerations

The Title 22 requirements for reliability were reviewed as they apply to the Wild Wings wastewater treatment facility. It was noted that although the Wild Wings facility currently meets some of the requirements, it does not meet all of them. Therefore, the option of doing nothing further to enhance the reliability of the sewage treatment is not a viable option.

As Option 6 was determined to not be viable from a regulatory perspective, no further investigation into the operational reliability, the production of recycled water, management, or cost was conducted.

[6] The California Code of Regulations, Title 22 Division 4 - Environmental Health, Chapter 3 - Water Recycling Criteria, Article 10 - Reliability Requirements for Full Treatment.

VIII. STUDY FINDINGS

The viable options were ranked for risk in the following categories:

- **Operation Reliability:**
  This factor considers the risk that the equipment and other infrastructure at the wastewater facility will not be reliable, which could lead to equipment failures or inability to meet the permit requirements. Ultimately unreliability leads to higher costs over time. Low risk equates to more reliability and a high risk equates to less reliability.
- **Recycled Water Production:**
  This factor assesses whether the option will reliably provide recycled water to irrigate the golf course. A low risk is associated with a high reliability of producing recycled water and a high risk is associated with no recycled water production.
- **Management**
  This factor looks at whether the management team (County of Yolo or the City of Woodland) will have the in-house resources and expertise needed to effectively manage the wastewater facility. A low risk is associated with more in-house resources and expertise and a higher risk is associated with less.
- **Regulatory Considerations:**
  The risk that future regulatory changes will result in increased costs to the Wild Wings homeowners is evaluated with this factor. A low risk is associated with spreading future regulatory-related costs over a larger pool of customers (Woodland + Wild Wings) and a higher risk is associated with the costs being absorbed only by Wild Wings property owners.
- **Construction Funding:**
  This risk is related to the ability to obtain construction funding. A low risk is associated with a less expensive project and the Wild Wings community being able to access reserve funds and/or save for construction in a reasonable amount of time. A higher risk is associated with the unknowns and costs of obtaining a large low-interest loan from the State revolving fund or a higher interest loan from a bank.
- **Community Support:**
  This risk considers the community support needed to move forward with the selected project. A lower risk is associated with the need for only a successful Proposition 218 proceedings in Wild Wings to adjust fees to pay for the selected project (written protest ballot). A higher risk is associated with needing a successful Proposition 218 proceeding to repay a construction loan and/or for increased operating costs (written protest approval), and a Woodland voter-approved (50% +1) revision to their Urban Limit Line.

Table 6 provides the relative risks of the 5 viable options in the categories listed above. In addition, estimated costs for construction, ongoing annual operation, maintenance, and capitol replacement costs for the Wild Wings residents and golf course are shown.

Again, a detailed rate study will need to be conducted in order to determine the actual fees to be paid by the Wild Wings homeowners and the golf course.

Table 6
Options – Cost & Risk Rankings

Factor	Options				
	1	2	3	4	5
Estimated Construction Cost[1]	$4.16 M	$6.96 M	$725k	$2.25M	$9.72M
Estimated Annual O&M Charge to Residents[2,3]	$2,950	$2,940	$2,860	$2,890	$1,670
Estimated Annual O & M Costs to Golf Course[2,3]	$29,700	$29,700	$27,100	$29,100	$14,400
Operation Reliability	Low	High	Med	Low	Low
Recycled Water Production	Low	Med	Med	Low	High
Management	Med	Med	Med	Med	Low
Regulatory Considerations	High	High	High	High	Low
Construction Funding	Med	Med	Low	Low	High
Community Support	Med	Med	Low	Low	High

Option 1 - Build a second plant as large as the first plant
Option 2 - Build long-term storage facility
Option 3 - Combination of redundant and standby equipment
Option 4 - Build a smaller second plant
Option 5 - Connect to the City of Woodland
Option 6 - Do nothing (Not Viable)

Notes:

1. The estimated construction costs **do not include the financing fees or annual repayment amounts** as the exact type of loan, length of the loan interest rate, and debt coverage is not able to be determined at this time. Fees will increase exponentially for projects with larger construction costs.
2. Annual costs are based on 2018-19 costs. The annual costs include current and estimated future operations, maintenance, and replacement costs.
3. Per the Engineers Fee Report dated April 10, 2018, the 338 Wild Wings homeowners pay 97.1% of the cost for the WWTP ($894,111 in 2018-19), and the golf course pays 2.9% ($26,704 in 2018-29). The 2018-19 charges are $2,645/year for residents, not including an additional loan repayment of $291.50 which will end in 2023. The current golf course charges are $26,704/year.

Using the present worth costs and the triple down methodology, Option 4 (Build a Smaller Plant) has a relatively low cost with the least amount of risk of all of the studied options.