Phase 1
Executive Summary

Paradise Sewer Project

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1. Introduction

The Town of Paradise (Town) is implementing the Paradise Sewer Project (Project), which involves identifying and implementing a long-term solution for collection, treatment, and reuse/disposal of its wastewater. HDR is under contract to assist the Town with the first two phases of the Project—final selection of a wastewater alternative (Phase 1), and preparation of an Environmental Impact Report (EIR) covering the selected alternative (Phase 2). This document provides an executive summary of the six technical memoranda (TM) prepared as part of the Phase 1 effort:

1. Project Definition
2. Design Criteria for Local Wastewater Treatment Plant
3. Evaluation of Collection System
4. Local Wastewater Treatment and Disposal Alternatives
5. Regional Alternative
6. Comparison of Local and Regional Alternatives

2. Background

Prior to the Camp Fire, Paradise was the largest unsewered community in California. A new wastewater management solution is needed to improve the local economy (e.g., encourage opening of new businesses) and to stop degradation of groundwater quality caused by failed or failing septic systems.

The need for a centralized wastewater treatment solution for Paradise has been studied in seven prior reports. The most recent study was prepared by Bennett Engineering in June 2017, *Town of Paradise Sewer Project, Alternative Analysis and Feasibility Report: Determining a Preferred Option for Implementation* (2017 Report). Figure 1 presents the proposed sewer service area (SSA) identified in the 2017 Report; the Town has directed that this be the proposed SSA for this effort. Based on the 2017 Report, the proposed SSA was defined to represent the area that had the most septic systems that had failed or were projected to fail within the next 5 years. The proposed SSA will serve 1,469 parcels through the Skyway, Clark Road, and Pearson Road corridors. (There are 11,000 total parcels in Paradise.) The SSA also would serve most businesses in Paradise and provide for future development of more multi-family residences, which is currently limited because of septic system constraints.

To reduce collection system capital costs, the 2017 Report recommended the use of a septic tank effluent pumping (STEP) system, which discharges into shallow gravity sewers. This STEP system would require that individual septic tanks remain in use. After completion of the 2017 Report, Paradise citizens indicated a strong preference to eliminate septic tanks and/or pumps on individual parcels. As a result, for this Project, the Town directed the development of a traditional gravity sewer system, which eliminates septic tanks.

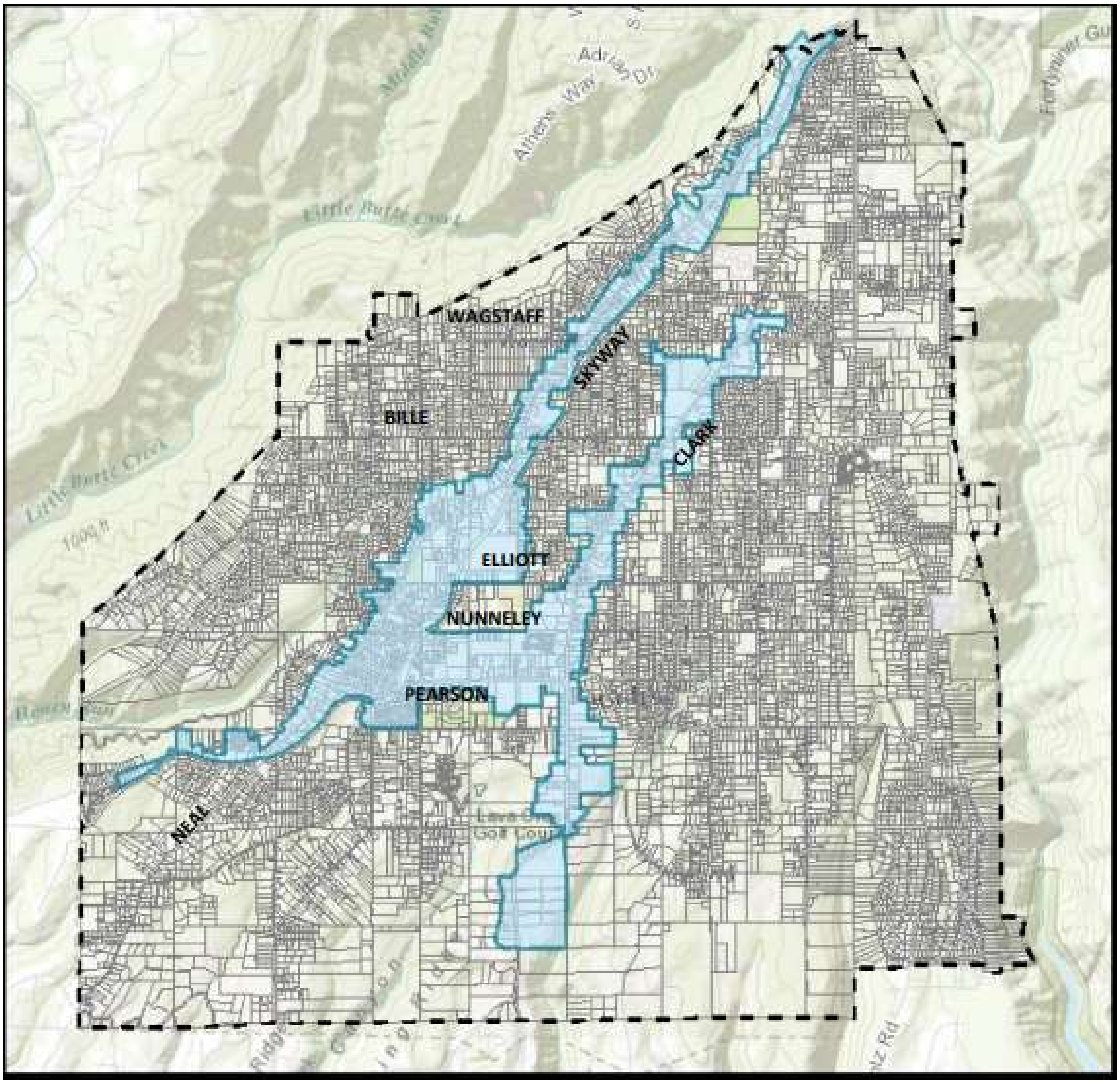

Figure 1. Proposed Town of Paradise Sewer Service Area

3. Project Definition

3.1 Connection and Flow Estimates

The SSA contains 1,469 parcels. As of April 2020, there were 300 parcels with habitable structures within the SSA. The Project is estimated to come on-line by 2027, at which time there will be an estimated 357 occupied parcels within the SSA generating an average wastewater flow of 109,000 gallons per day (gpd; see Figure 2). It is estimated that it could take 30 years for all 1,469 parcels to be occupied, at which time the average wastewater flow would be 448,000 gpd.

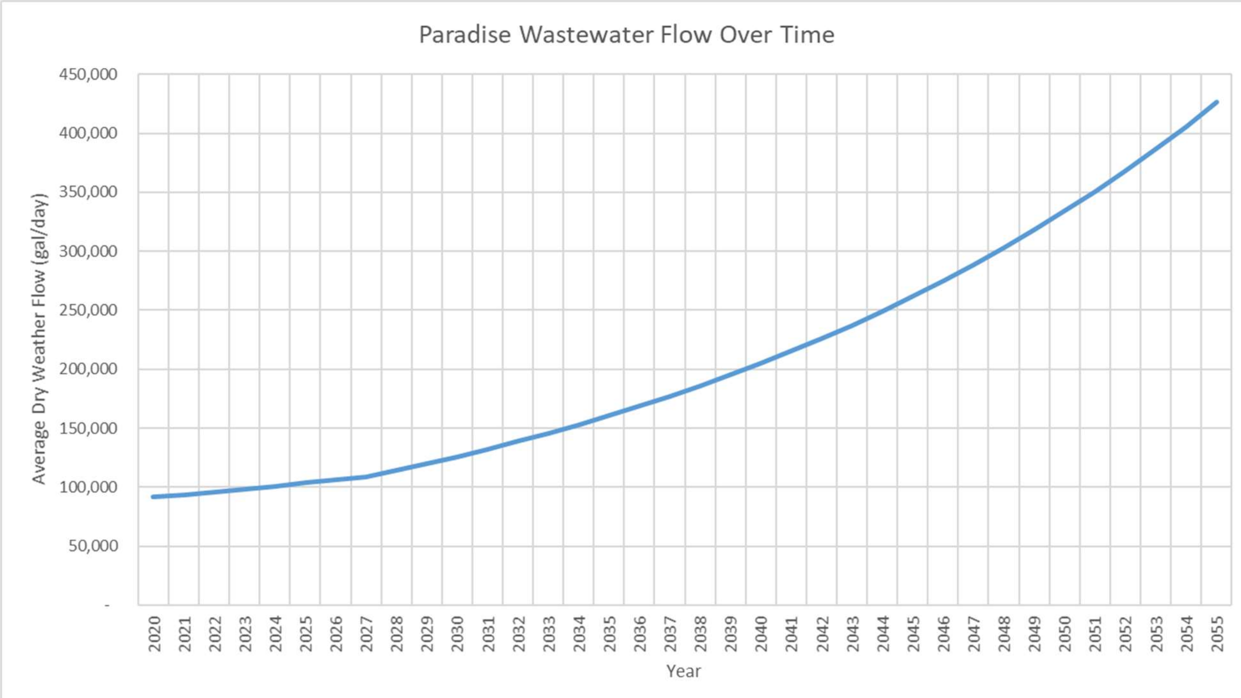

Figure 2. Estimated Paradise Wastewater Flow Over Time

3.2 Alternatives Analyzed

For the collection system, the Town directed that a gravity system be analyzed instead of a STEP system. The following two alternative gravity collection layouts were analyzed:

- Alternative A: Collection of Sewer Flow to Neal Road Corridor
- Alternative B: Collection of Sewer Flow to Clark Road Corridor

For wastewater treatment and disposal, both local and regional alternatives were analyzed. The local alternatives involve constructing a wastewater treatment plant (WWTP) near Paradise and disposing of the treated wastewater by various means. The following local alternatives were analyzed:

- Alternative 1: Local WWTP with Effluent Storage and Land Application
- Alternative 2: Local WWTP with a Surface Water Discharge
- Alternative 3: Local WWTP with Water Recycling
- Alternative 4: Local WWTP with Discharge to the Miocene Canal

The regional alternative involves conveying raw wastewater from Paradise through an 18-mile-long pipeline to the City of Chico Water Pollution Control Plant (WPCP) where it would be treated. This alternative involved analysis of the following two potential pipeline routes to the Chico WPCP:

- Alternative A: Skyway Route
- Alternative B: Neal Road Route

4. Design Criteria

In order to size the components of the various alternatives, it was necessary to establish design criteria. A local WWTP must treat wastewater to a high enough degree that it can be safely used or discharged. The anticipated discharge requirements for the four local alternatives are shown in Table 1.

Table 1. Anticipated Discharge Requirements for Local Alternatives

Disposal Method	Basic Discharge Requirements (monthly average)			Level of Treatment
	BOD, mg/L	TSS, mg/L	Total N, mg/L	
1. Local WWTP with Effluent Storage and Land Application	30	30	10	Disinfected (23 MPN) secondary treatment meeting Total N of 10 mg/L.
2. Local WWTP with Surface Water Discharge	10	10	10	Disinfected (2.2 MPN) tertiary treatment meeting Total N of 10 mg/L. Additional stringent discharge requirements are likely, such as meeting priority pollutant (chemical pollutants the US Environmental Protection Agency regulates) criteria as well as the California Thermal Plan (limit wastewater increasing receiving water temperature).
3. Local WWTP with Water Recycling	10	10	10	Disinfected (2.2 MPN) tertiary treatment meeting Total N of 10 mg/L.
4. Local WWTP with Discharge to the Miocene Canal	10	10	10	Disinfected (2.2 MPN) tertiary treatment meeting Total N of 10 mg/L. Additional advanced treatment requirements must be met, including, as a minimum, processes to meet indirect potable reuse requirements such as ultrafiltration along with reverse osmosis.

Notes: BOD = biochemical oxygen demand; MPN = most probable number; N = nitrogen; TSS = total suspended solids

In addition, the quantity and pollutant load of wastewater to be conveyed, treated, and disposed of was estimated (see Table 2).

Table 2. Recommended Wastewater Design Flows and Loads

Flow Type	Flow to WWTP, gpd		
Average Dry Weather Flow	448,000		
Peak Diurnal Flow	672,000		
Peak Wet Weather Flow	896,000		
Constituent	**Concentration, mg/L**	**Annual Average Constituent Load, lbs/day**	**Maximum Month Constituent Load, lbs/day (1)**
Biochemical Oxygen Demand (BOD)	350	1,310	1,700
Total Suspended Solids (TSS)	400	1,500	1,950
Ammonia as Nitrogen	45	170	220

(1) Based on flow of 448,000 gpd and peaking factor of 1.3
mg/L = milligrams per liter
lbs/day = pounds per day

5. Collection System Evaluation

Two alternative gravity collection system layouts were developed: Alternative A, which would serve a local WWTP on Neal Road (see Figure 3), and Alternative B, which would serve a local WWTP on Clark Road. The alternatives are nearly identical, and both could serve the urban core of Paradise. A significant number of pump stations (approximately 28) would be required to serve the 1,469 parcels in the proposed SSA. This number may be slightly reduced in final design by placing some of the collection system in easements and out of the available streets and public right-of-way. However, the topography of Paradise still requires multiple pump stations, which will come with significant monitoring and maintenance.

The costs of the two collection system alternatives are very similar, as shown in Table 3. The cost to implement the project (capital cost) has been estimated, along with life cycle costs (net present value) over a 20-year period. The net present value includes the capital cost, annual operations and maintenance (O&M) costs, and deduction of the asset salvage value at the end of 20 years. A part of the evaluation of the local WWTP option is evaluating whether to locate the local WWTP on Neal Road or Clark Road. With costs so similar between the two collection system alternatives, it appears that the collection system will not be a significant factor in determining the WWTP location.

Table 3. Capital Cost and Net Present Value of Collection System Alternatives

Alternative	Capital Cost ($) (A)	Present Value O&M, 0.3%, 20-yr ($) (B)	PV Salvage Value, 0.3%, 20-yr ($) (C)	Net Present Value ($) (A+B-C)
A: Collection of Sewer Flow to Neal Road Corridor	119,510,190	19,769,701	33,026,693	106,253,198
B: Collection of Sewer Flow to Clark Road Corridor	119,571,440	19,812,853	33,043,646	106,340,647

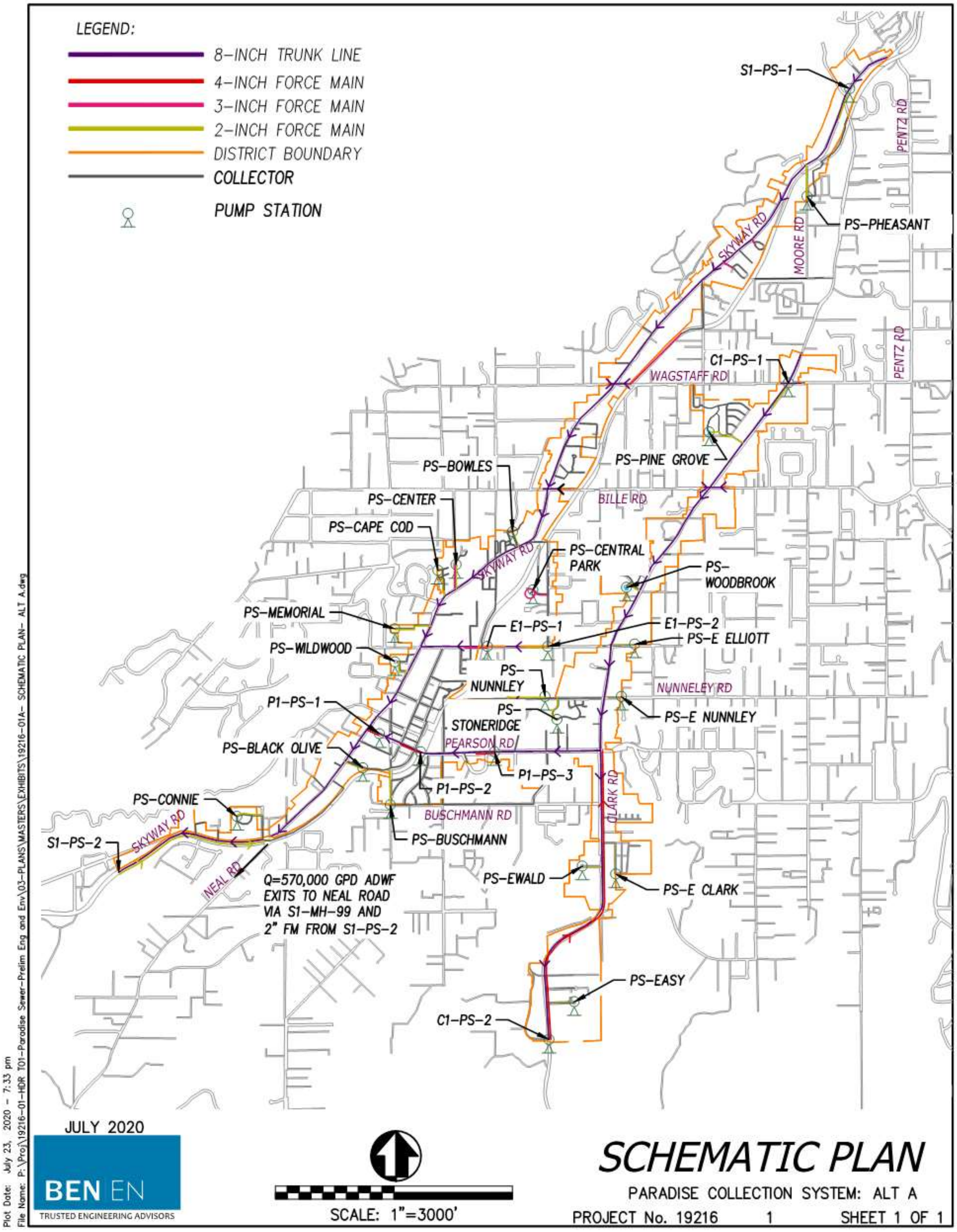

Figure 3. Schematic of Collection System – Alternative A

6. Local Wastewater Treatment and Disposal Alternatives

In general, the local alternatives have the following components:

- Pump station and pipeline from the end of the collection system to the local WWTP
- Land for the local WWTP
- Pipeline from the local WWTP to a discharge or reuse location
- Land for effluent storage (Alternative 1 only)
- Land contracted for agricultural application (Alternative 1 only)

Using the criteria discussed in Section 4, land requirements were developed for the four local alternatives, as shown in Table 4.

Table 4. Land Requirements

Description	Active Acres	Total Acres with Buffer
Treatment Plant		
Secondary or Tertiary Treatment (Alternatives 1, 2, and 3)	4	5
Tertiary with Advanced Treatment (Alternative 4)	6	7
Effluent Storage (Alternative 1 only)	122	150
Land Application (Alternative 1 only)	260	310

6.1 Alternative 1: Local WWTP with Effluent Storage and Land Application

For Alternative 1, potential locations for the WWTP and land for effluent storage and land application, shown in Figure 4, were assessed. Areas along Neal Road and Clark Road were examined to identify potential WWTP locations using the following criteria:

- Relatively close to the Town limits, to minimize conveyance distance.
- Near a facility that is less desirable for development and more suitable for locating a WWTP (e.g., the Neal Road Recycling and Waste Facility).
- Currently available vacant parcels of the size needed for the WWTP and adjacent to Neal Road or Clark Road. Skyway was not included, as an industrial facility such as a WWTP was not considered compatible with the current and future land uses along Skyway.

In Figure 4, the potential WWTP locations shown indicate general locations, not specific parcels or land requirements. The potential WWTP locations are generally as follows:

- Neal Road just south of the Town limits
- Neal Road near the Neal Road Recycling and Waste Facility
- Clark Road just south of the Town limits
- Clark Road near the Paradise Airport

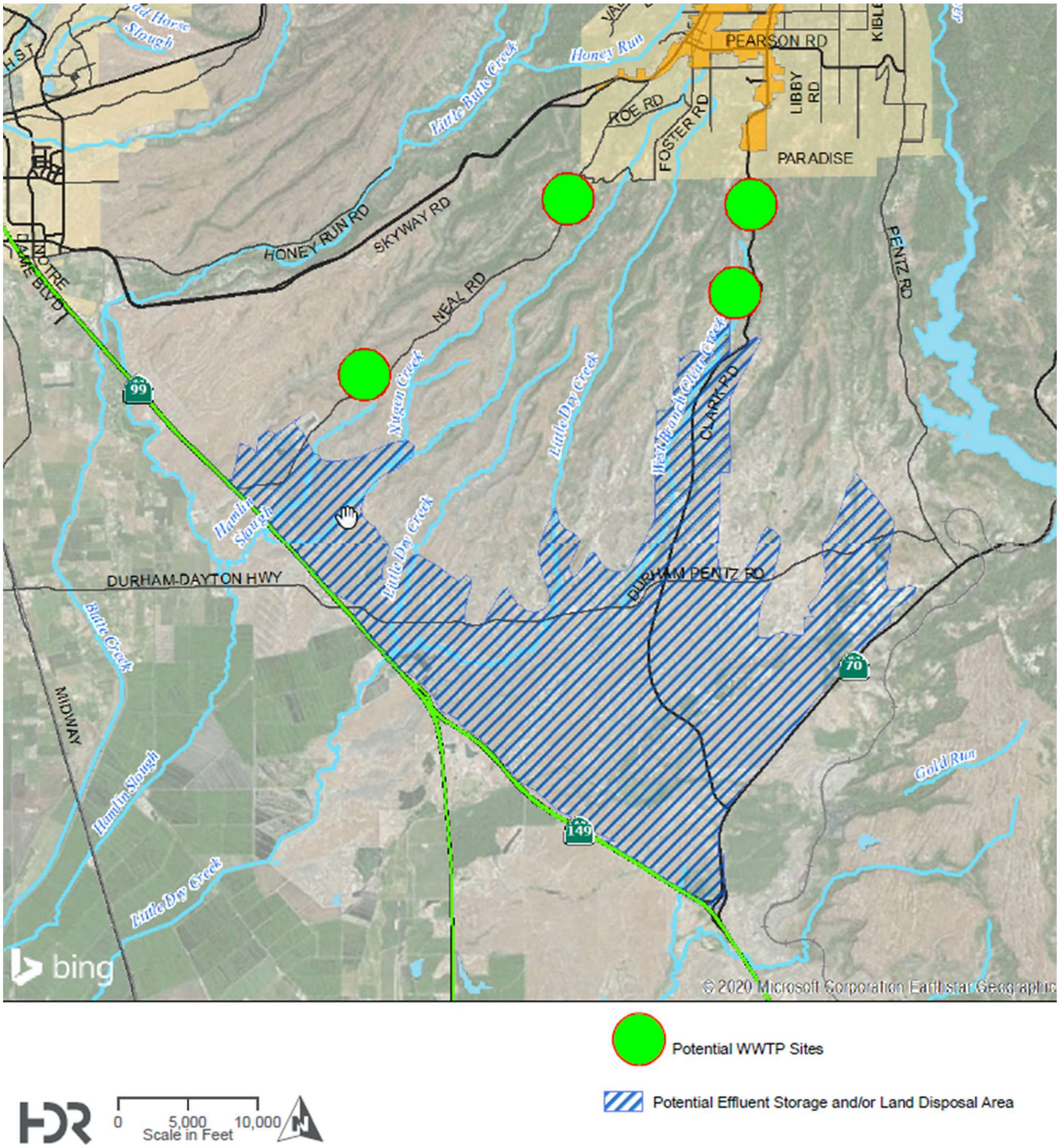

Figure 4. Potential Locations for WWTP Sites, Effluent Storage, and Land Application for Alternative 1

The area where effluent storage and land application could occur is shown as the blue-hatched area in Figure 4. This blue-hatched area was defined based on the following criteria:

- The land topography must be flat enough to allow for piped spray irrigation. As you move south off of the ridge from Paradise, you encounter marginal grazing land that is hilly but could be irrigated (although almost none of it is at this time). This defines the undulating northern boundary of the area shown.
- As you continue to move south and west, the topography becomes flatter, until land use changes from marginal grazing land to high end agriculture (e.g., rice farming) at roughly Highway 99/149. Based on discussions with the Butte County Farm Bureau, it was determined that this high-end farming area has sufficient low-cost water available. It was also felt that farmers here might have concerns with using recycled water on their higher-end crops. Therefore, these high-end agricultural areas were not considered good candidates for land application, and Highway 99/149 was considered the western border of the potential land application area.
- Highway 70 was used as the southeast boundary because topography east of Highway 70 becomes quite steep again.

The blue-hatched area shown as the potential storage and land application area in Figure 4 covers 16,020 acres. The total area needed for a Paradise land application system is 460 acres (150 acres for effluent storage and 310 acres for land application), or 2.9 percent of the 16,020 acres. A significant portion of the 16,020 acres includes environmental constraints such as vernal pools and tribal interest, each of which would likely require heightened consultation and mitigation requirements. Some landowners may also be resistant to the proposed changes in land use. However, it is felt that it would ultimately be feasible to obtain 460 usable acres within this 16,020-acre area.

6.2 Alternative 2: Local WWTP with a Surface Water Discharge

Alternative 2 includes a local WWTP, located on Neal Road, with discharge of treated effluent to a local surface water. Surface water discharge to Nugen Creek or Hamlin Slough, both ephemeral streams, was assumed for this alternative. (An ephemeral stream is a stream that flows only briefly during and following a period of rainfall in the immediate locality.) An exact location for the discharge into the creek or slough was not identified at this time.

6.3 Alternative 3: Local WWTP with Water Recycling

Alternative 3 includes a local WWTP with beneficial reuse of recycled water within Paradise. Currently, there are no identified uses for recycled water within Paradise. As the Town rebuilds following the 2018 Camp Fire, potential uses may be identified. To not limit potential future recycling, it is recommended that a local WWTP (if built) produce water that can meet the “unrestricted reuse” requirements of the State of California (Title 22 of the California Code of Regulations).

6.4 Alternative 4: Local WWTP with Discharge to the Miocene Canal

Alternative 4 includes a local WWTP with discharge to the Miocene Canal. The Miocene Canal begins north of Paradise, runs along its eastern edge, and ultimately terminates into a California Water Service Company (Cal Water) reservoir near the city of Oroville, California. Just south of Paradise, the canal empties into Kunkle Reservoir and then continues out of Kunkle Reservoir in a pipe and later an open canal. Under Alternative 4, a local WWTP would be located adjacent to Kunkle Reservoir on land currently owned by Pacific Gas and Electric Company (PG&E), with discharge to the Miocene Canal, as shown in Figure 5.

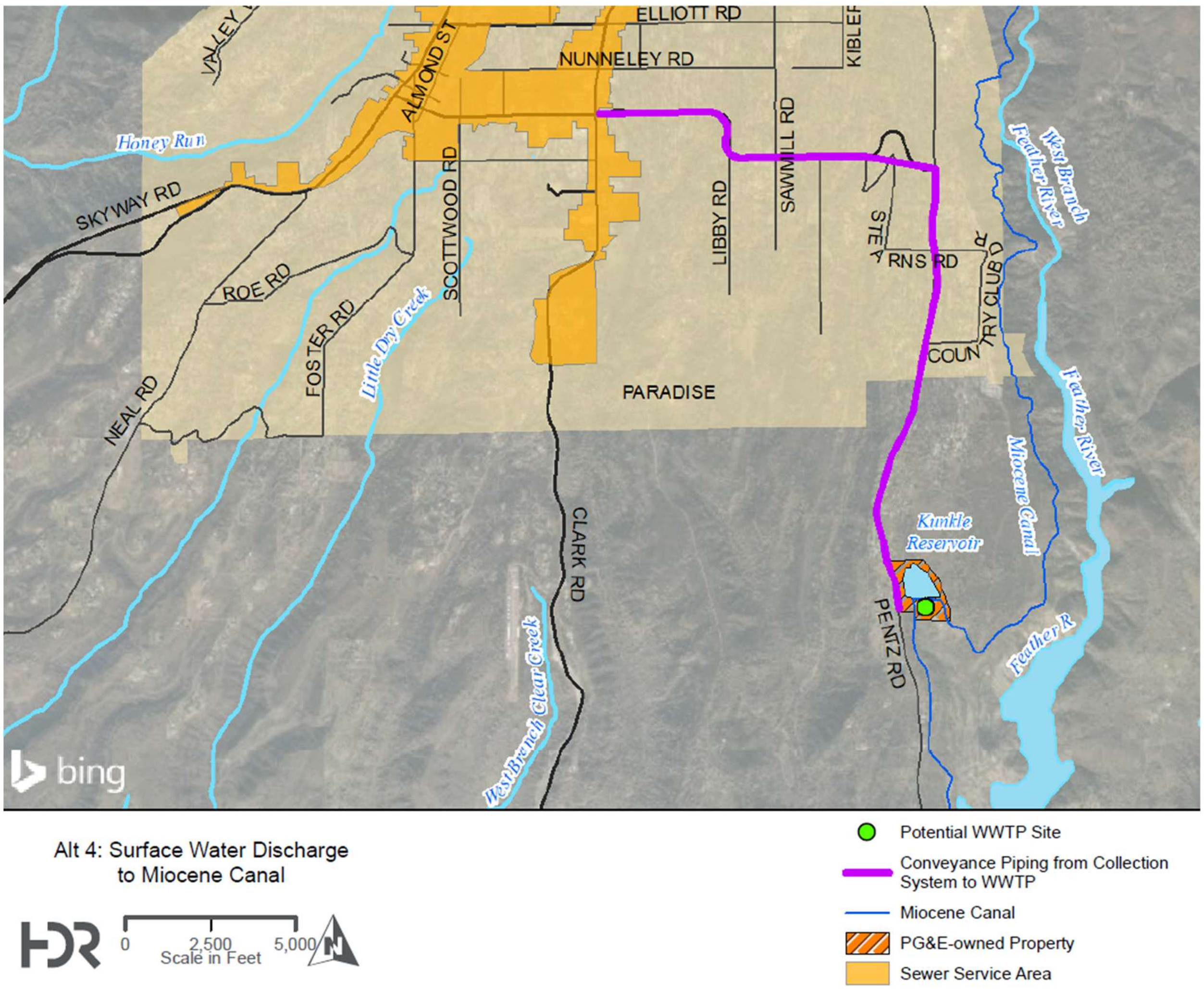

Figure 5. Location of the Miocene Canal and Alternative 4

The Miocene Canal has been owned and operated by PG&E since 1917. Prior to the 2018 Camp Fire, the Miocene Canal ran from a diversion on the West Branch of the Feather River to a small reservoir near Lake Oroville. The canal's upper reach runs from the Feather River diversion to Kunkle Reservoir; this reach was completely destroyed in the 2018 Camp Fire. The canal's lower reach runs from Kunkle Reservoir to a small terminal reservoir near Lake Oroville and is still intact. (The terminal reservoir is owned by Cal Water and has apparently been used in the past to supplement municipal supplies.) Water in the Miocene Canal is owned by PG&E and is sold to approximately 18 small agricultural diverters along the canal; diversions occur at various locations in the middle and lower reaches to irrigate orchards, water livestock, and for other agricultural uses.

Recently, PG&E has agreed to fund efforts to restore access to water for the next 5 years for residents impacted by the loss of the Miocene Canal. PG&E has indicated that it will not be restoring the upper reaches of the Miocene Canal. At the time of this writing, PG&E has proposed to supply the canal with 10 cfs of water for 5 years. PG&E has proposed to pump water from a barge located at the Lake Oroville Marina, just south of the Lime Saddle Recreation Area, to discharge into the Miocene Canal approximately 0.5 miles due west of that location. At the end of the 5 years, PG&E intends to discontinue feeding water into the canal and will look to a new entity to take over the pumping of the water.

The concept for Alternative 4 is to discharge 0.7 cfs (448,000 gallons per day) of advance-treated wastewater directly into the Miocene Canal at that location, where it will eventually mix with the 10 cfs of surface water from Lake Oroville that will be pumped by PG&E into the canal.

6.5 Screening of the Local Alternatives

The four local alternatives were screened based on whether they were deemed feasible for implementation, as follows:

- Alternative 1: Local WWTP with Effluent Storage and Land Application
    - This alternative was deemed feasible and carried forward.
- Alternative 2: Local WWTP with a Surface Water Discharge
    - This alternative was deemed not feasible due to lack of support by the Central Valley Regional Water Quality Control Board for issuing a surface water discharge permit, and the potential for a very onerous discharge permit if one was issued.
- Alternative 3: Local WWTP with Water Recycling
    - This alternative was deemed not feasible at this time due to a lack of recycled water users in the area. It should be noted that Alternatives 1 and 4 contain a sufficient level of treatment such that water recycling could still be implemented in the future, should sufficient recycled water uses develop.
- Alternative 4: Local WWTP with Discharge to the Miocene Canal
    - This alternative was deemed feasible and carried forward.

Based on this screening, local Alternatives 1 and 4 were carried forward for comparison against the regional alternative.

7. Regional Alternative

For the regional alternative, the Town would convey its wastewater to the Chico WPCP for treatment. The Town would construct a regional pipeline system consisting of an 18-mile pipeline (two 6-inch-diameter pipes), two pump stations, and a termination structure at the Chico WPCP. Instead of building treatment facilities, the Town would pay a connection fee to the City of Chico proportional to the capital cost of treatment facilities needed to treat the Town's wastewater. On an ongoing basis, the Town would pay the City a monthly treatment user fee for Paradise residents discharging to the wastewater system at that time.

7.1 Regional Pipeline

Two routes were analyzed for the regional pipeline, as shown in Figure 6:

- Alternative A: Skyway Route
- Alternative B: Neal Road Route

Working with staff from the City of Chico and Butte County, three subalternatives were identified in the area south of Chico. These subalternatives are part of Alternative A: Skyway Route.

Alternative A: Skyway Route is recommended for the following reasons:

- The capital cost and net present value of the Skyway route are both less than the Neal Road route (Alternative B), primarily due to the shorter length of the alignment.
- Although Skyway carries more traffic volume than Neal Road, it also has a significantly larger right-of-way in which to install a pipeline while also handling traffic routing around a construction zone.
- The environmental constraints on both alternatives are similar.

The subalternatives for the Skyway route will be carried forward into Phase 2 for further analysis.

7.2 Chico Treatment Connection Fee Evaluation

The capital cost of the regional alternative includes payment of a treatment connection fee to the City of Chico. The connection fee is a charge to cover capital expenditures needed at the Chico WPCP resulting from the addition of flow from Paradise. The actual connection fee would be negotiated between the Town of Paradise and the City of Chico during the early part of Phase 2. However, to compare alternatives in this Phase 1 effort, it was necessary to estimate the connection fee. Two estimates were developed. One was made using the current City of Chico connection fees. Because those fees are anticipated to increase in the future, a second estimate was made by examining data from around California contained in the State Water Resources Control Board (SWRCB) Connection Rate Report for 2016–2017.

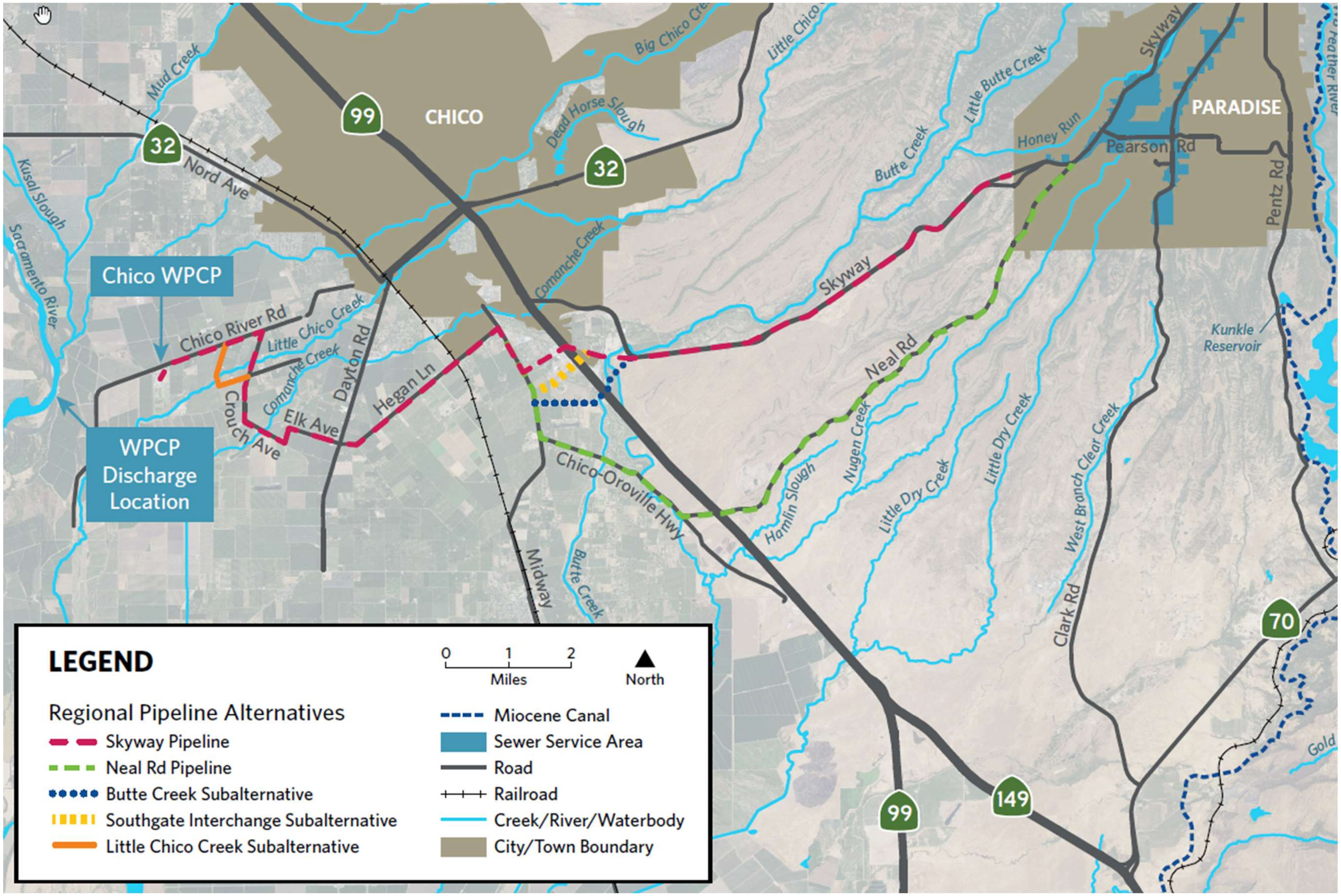

Figure 6. Regional Pipeline Alternatives

Connection costs were estimated using the following steps:

1. The connection cost was broken down into two components—residential and non-residential (i.e., commercial and industrial). The monthly sewer use fee for non-residential users was estimated to be twice the rate for a residential connection.

2. The connection fee was estimated for the build-out of the SSA, a total of 1,469 parcels (assumed to be 647 residential and 822 non-residential).

Based on the information above, a range of potential connections fees for the Town was calculated and is presented in Table 5.

Table 5. Estimated Treatment Connection Cost for the Build-out of the Sewer Service Area

Description	No. of Connections	Connection Fee ($/connection)		Total Connection Cost	
		Current City of Chico	Average From SWRCB Report	Current City of Chico	Average From SWRCB Report
Residential	647	$1,551	$5,747	$1,003,497	$3,668,525
Non-Residential	822	$5,779	$11,494	$4,750,338	$9,321,570
Total Estimated Connection Fee				**$5,753,835**	**$12,990,095**

As shown in Table 5, the estimated connection cost ranges from approximately $5.8 million to $13.0 million. For the purposes of comparison of alternatives, the $12,990,095 connection cost was used.

8. Summary of Treatment Alternative Costs

The cost estimates for the treatment alternatives carried forward for comparison are shown in Table 6. Capital and net present value costs were estimated for each treatment alternative. The capital cost includes the following components:

- Construction cost
- Implementation costs, which include other costs incurred to construct a facility, such as engineering design, right-of-way acquisition, and construction management
- Treatment connection fee, as described in Section 7.2

As noted in Section 5, the collection system, a component common to all alternatives, has an estimated capital cost of $119.5 million.

Table 6. Summary of Treatment Alternative Cost Estimates

Component	Local Alternatives		Regional Alternative (Avg. Connection Fee)
	Alt. 1 - Land Application	Alt. 4 - Miocene Canal	
Construction	$49.2M	$109.6 M	$37.5M
Implementation Costs	$19.8M	$48.1M	$14.7M
Connection Fee	NA	NA	$13.0M
Total Capital Cost	**$69.0M**	**$157.7M**	**$65.2M**
Net Present Value	$70.7M	$233.8M	$65.3M

NA = Not Applicable

9. Comparison of Treatment Alternatives

The three treatment alternatives carried forward, summarized in Figure 7, were then compared. Because the collection system is common to all alternatives, it was not included in the comparison of the three treatment alternatives.

9.1 Method of Comparison

The treatment alternatives were scored and compared using a mathematical matrix. The matrix divides the scoring into five categories, each with their own criteria. The following categories and criteria were used:

- **Economic:** The economic category focuses on the initial and long-term (operational) costs of an alternative. The criteria are as follows:
  - **EC1, Net Present Value:** Total life cycle costs include capital costs, O&M costs, ongoing user fees (if applicable), and salvage value, calculated as net present value.
  - **EC2, Capital Costs:** Capital costs include construction costs, soft costs associated with implementation, and connection fees.
- **Social:** Social considerations focus on impacts on people, including impacts on time, safety, recreation, property, and convenience. The criteria are as follows:
  - **SO1, Construction Impacts on the Community:** Examples of construction impacts are traffic, noise, and dust generated by construction activities.
  - **SO2, Permanent Impacts on the Community:** Permanent impacts are from installed facilities and include issues such as visual, noise, and odor.
  - **SO3, Ongoing Monitoring or Mitigation Required:** Monitoring and/or mitigation requirements are needed to offset impacts on the community.

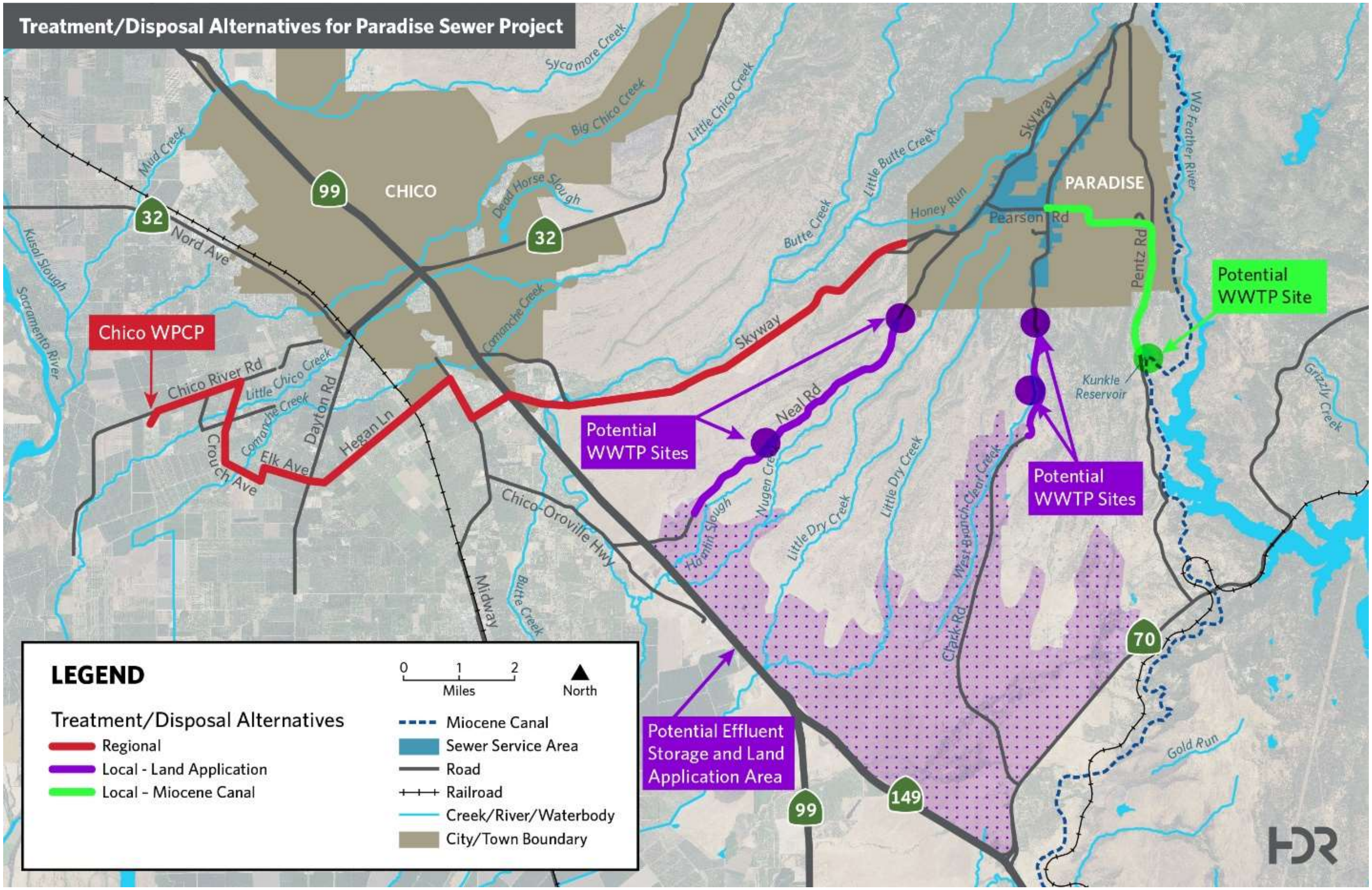

Figure 7. Local and Regional Treatment Alternatives

- **Environmental:** Environmental impacts involve impacts on the natural environment, including air or water quality, habitat, species, ecosystem function, and human health. The criteria are as follows:
    - **EV1, Construction or Operational Impacts on Sensitive Resources:** Construction or operational impacts may be on specific sensitive environmental resources, such as vernal pools or cultural resources.
    - **EV2, Environmental Permitting Requirements:** Scoring is based on the simplicity of environmental permitting (i.e., shorter time required to obtain the permit), the potential to avoid resources (and thus avoid permitting), and the predictability of obtaining an environmental permit (some agencies are more difficult and unpredictable when it comes to issuing a permit).
    - **EV3, Permanent Loss of Agricultural Land:** Butte County has an overall goal of maintaining agricultural land, and some alternatives result in permanent loss of the ability to farm the land.
- **Implementation:** Implementation issues relate to the ability to get a project approved for construction. The criteria are as follows:
    - **IM1, Obtaining Non-Environmental Permits or Regulatory Approvals:** This criterion considers how difficult it may be to obtain permits or agency approvals. Examples include an initial National Pollutant Discharge Elimination System permit, railroad or Caltrans crossing permits, and Cal Water approval of a Miocene Canal alternative.
    - **IM2, Obtaining Political Approvals:** This criterion considers how difficult it may be to obtain political approvals or to negotiate contracts between political bodies.
    - **IM3, Cooperation of Local Landowners:** This criterion considers the willingness of local agricultural landowners to use treated wastewater, or the willingness of local landowners to sell their land (i.e., willing sellers).
- **Operational:** Operational impacts inhibit the ease of operation and maintenance of the assets under consideration or can relate to challenges in meeting regulatory requirements. The criteria are as follows:
    - **OP1, Legal and Regulatory Requirements:** This criterion considers how stringent legal and regulatory requirements are (e.g., risk of future regulatory violations/fines) and the potential for future increases in regulatory requirements (e.g., National Pollutant Discharge Elimination System permit limits, waste discharge requirements).
    - **OP2, Technical Complexity:** This criterion considers the technical complexity of operation and maintenance (e.g., a complex wastewater treatment process).
    - **OP3, System Flexibility:** This criterion considers the flexibility to change operation of the system as conditions change. This can include the ability to respond in an emergency and if weather conditions change. Flexibility can be provided through storage of wastewater, redundant facilities, or the ability to change/divert flows.

9.2 Alternative Ranking and Recommendation

Using the categories and criteria presented in Section 9.1, the three treatment alternatives were scored, with the results shown in Table 7 (presented at the end of this document). Of the five categories, the first (economic) was scored using the cost estimates shown in Table 6. The remaining four non-economic categories were scored based on the experience of the project team using the scoring guidance shown in Table 7.

In scoring and comparing alternatives, it is possible that not all categories, or criteria within a category, are considered to have equal weight in the overall decision-making process. Weighting factors are used to capture this potential difference. Scores are multiplied by these weighting factors to create weighted scores, which are then added up to create a total weighted score. In Table 7, equal weights are applied to each of the five categories (i.e., 20 points each, for a total of 100). Within each category, those 20 points were distributed among the two or three criteria. This distribution was done by the project team based on their experience and the assumed contribution of each criterion to the overall category.

As shown in Table 7 and in Figure 8, the regional alternative has the highest weighted score, 46 percent higher than the local land application alternative and 96 percent higher than the Miocene Canal alternative. In four of the five categories (the exception is the operational category), the regional alternative scored higher than the two local alternatives. In the operational category, the regional alternative scored only slightly lower than the local land application alternative. This would indicate that even if the category weighting factors were changed, the regional alternative would still rank highest.

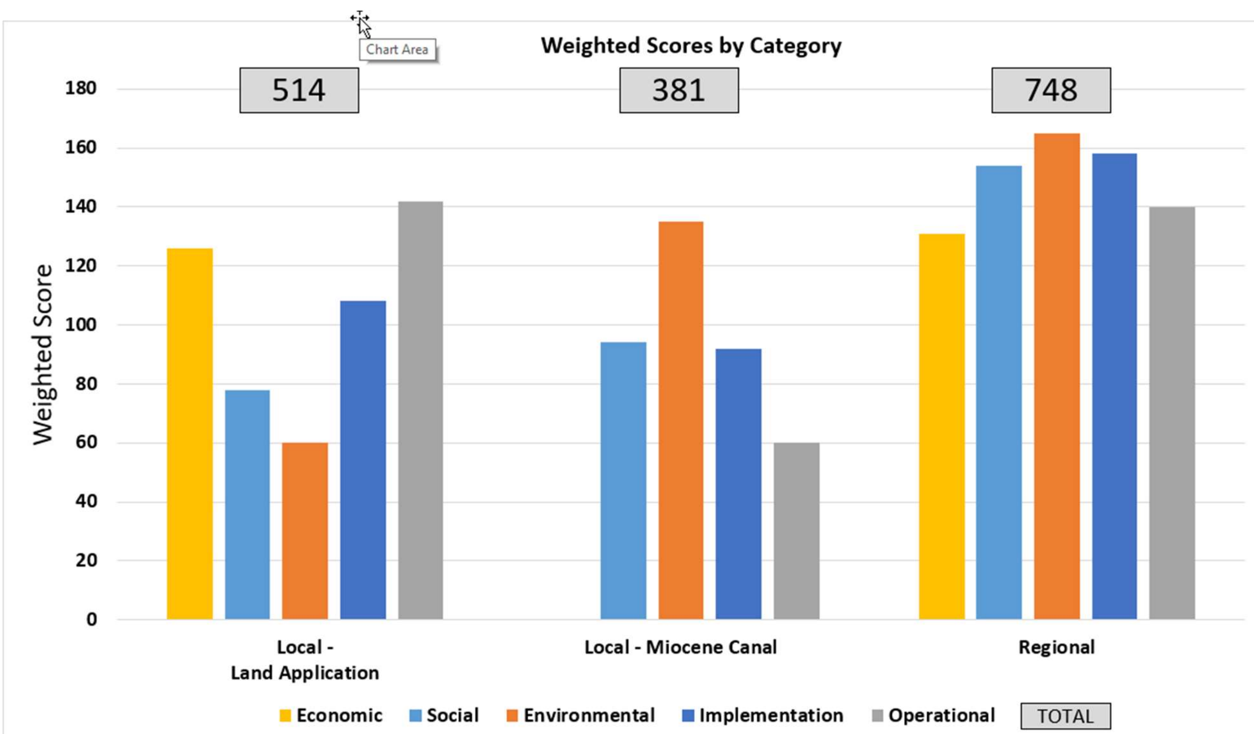

Figure 8. Comparison of Treatment Alternative Scores by Category

It is recommended that the regional alternative be carried forward into Phase 2 as the preferred alternative, for the following reasons:

- **Economic**: It has the lowest capital and net present value costs.
- **Social**: It has the lowest community impacts during and after construction.
- **Environmental**: It has the least probable environmental impacts.
- **Implementation**: It has the fewest permits needed and has the support of the Central Valley Regional Water Quality Control Board.
- **Operational**: It is the least complicated to operate and will benefit from the experienced O&M staff at the Chico WPCP.

10. Next Steps and Funding Needs

This section describes the next steps involved in implementing the Project, including an overall schedule, an estimate of funding needs, and key activities during Phase 2.

10.1 Project Schedule

The Project will be implemented in the following four phases, as shown in Figure 9, with completion anticipated near the end of 2026:

- Phase 1 – Planning (the effort covered by this document)
- Phase 2 – Preliminary Engineering and EIR
- Phase 3 – Final Design, Right-of-Way Acquisition, and Environmental Permitting
- Phase 4 – Construction

Selection of a preferred alternative marks the end of Phase 1. Phase 2 will focus on completion of an EIR, obtaining funding for Phases 3 and 4, and developing an agreement with the City of Chico (if the regional alternative is selected). Phase 3 will consist of final design efforts, which will help define right-of-way needs, allowing acquisitions to proceed. It will also involve finalizing construction funding and obtaining time-consuming environmental permits. With all of those items in place, the Project will move into Phase 4, concurrent construction of the collection system and the regional pipeline.

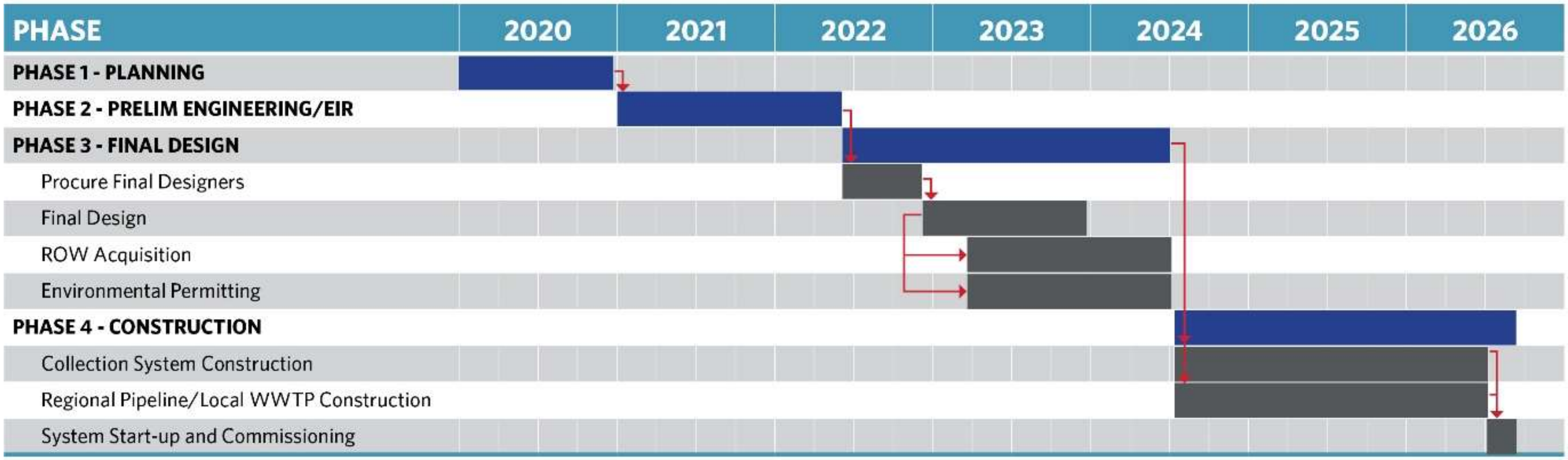

Figure 9. Schedule for the Paradise Sewer Project

10.2 Funding Needs

The total capital costs for the collection system and regional alternative are shown in Table 8. The costs are apportioned out into Phases 2, 3, and 4 (as shown in Figure 9).

Table 8. Summary of Capital Costs by Phase

Component	Deep Gravity Collection System ($)	Regional Alternative ($)	Total ($)	Phase 2 Prelim. Eng./EIR	Phase 3 Final Design	Phase 4 Construction
Construction Costs						
Base Construction Cost	$58,443,000	$26,249,000	$84,692,000			
Undefined Scope	$17,533,000	$7,875,000	$25,408,000			
Subtotal	**$75,976,000**	**$34,124,000**	**$110,100,000**			
Construction Contingency	$7,598,000	$3,412,000	$11,010,000			
Construction Cost Total	**$83,574,000**	**$37,536,000**	**$121,110,000**			**$121,110,000**
Implementation (Soft) Costs						
Project Administration	$4,179,000	$1,877,000	$6,056,000	$450,000	$2,725,000	$2,881,000
Legal Counsel	$836,000	$375,000	$1,211,000		$1,211,000	
Preliminary Engineering	$2,507,000	$1,126,000	$3,633,000		$3,633,000	
Final Design	$10,865,000	$3,754,000	$14,619,000		$14,619,000	
Environmental Documentation/Permitting	$2,507,000	$1,126,000	$3,633,000	$1,542,000	$2,091,000	
Right-of-Way Acquisition	$2,507,000	$1,126,000	$3,633,000		$3,633,000	
Construction Management	$6,686,000	$3,002,000	$9,688,000			$9,688,000
Engineering Services During Construction	$3,343,000	$1,126,000	$4,469,000			$4,469,000
Env. Monitoring/Regulatory Compliance	$836,000	$375,000	$1,211,000			$1,211,000
Environmental Mitigation	$1,671,000	$751,000	$2,422,000		$2,422,000	
Implementation Cost Total	**$35,937,000**	**$14,638,000**	**$50,575,000**	**$5,625,000**	**$26,701,000**	**$18,249,000**
Connection Fee (Avg. From SWRCB Report)		$12,990,000	$12,990,000			$12,990,000
Total Capital Cost	**$119,511,000**	**$65,164,000**	**$184,675,000**	**$1,992,000**	**$30,334,000**	**$152,349,000**

10.3 Key Activities During Phase 2

The following key activities are anticipated during Phase 2:

- Complete the EIR and supporting technical work.
- Secure funding for Phase 3, and identify and pursue funding for Phase 4 (construction).
- Address any requirements from the Butte County Local Agency Formation Commission (LAFCO).

- Continue to coordinate with Butte County staff on issues related to facilities in rural Butte County.
- Conduct public outreach throughout Phase 2.

In addition, if the regional alternative is selected by the Town, it is anticipated that the Town of Paradise and the City of Chico will negotiate an inter-municipal agreement for Paradise connection early in Phase 2. (The City of Chico has a provision in its municipal code, Section 15.40.285—Regulation of Waste Received from Other Jurisdictions, for such a situation.) One possible approach for this negotiation would be as follows:

1. A Working Committee is formed consisting of members of the Paradise Town Council and the Chico City Council, with support from their respective staff and consultants.
2. The Working Committee meets on a regular basis to develop a Memorandum of Understanding (MOU) that captures the agreed-upon principles of the inter-municipal agreement.
3. Legal staff from the Town of Paradise and the City of Chico collaborate to turn the MOU into a draft agreement.
4. The agreement is reviewed and approved by the Paradise Town Council and Chico City Council.

The legal agreement would need to cover numerous subjects, including the following:

- **Connection Fees:** Establish the treatment connection fee to be paid by the Town.
- **Monthly User Fees:** Establish monthly user fees charged to the Town.
- **Approval of Future Flows/Connections:** Specify a total amount of flow that Paradise can send to the Chico WPCP in the future. Identify the process for approving future connections.
- **O&M of Facilities:** The Town will be constructing a regional pipeline and a termination structure at the Chico WPCP. Define who is responsible for O&M and future repairs/replacements on these facilities.
- **Industrial Dischargers:** All Paradise industrial dischargers would be subject to the City of Chico's industrial pretreatment program. Identify how to implement that effort.

Table 7. Treatment Alternative Comparison Matrix

Category	Criteria ID	Criteria	Description	Scoring Guidance	Weight	Score: Local - Land Application	Score: Local - Miocene Canal	Score: Regional	Weighted Score: Local - Land Application	Weighted Score: Local - Miocene Canal	Weighted Score: Regional
Economic	EC1	Net Present Value	The present value (in $ million) of the capital, O&M, and salvage costs associated with implementing each alternative.	Scores are created by linearly scaling between "0" for the highest cost and "10" for zero cost.	10	$70.7 7.0	$233.8 0.0	$65.3 7.2	70	0	72
Economic	EC2	Capital Costs	The capital costs (in $ million) associated with implementing each alternative. Does not include collection system cost.	Scores are created by linearly scaling between "0" for the highest cost and "10" for zero cost.	10	$69.0 5.6	$157.7 0.0	$65.2 5.9	56	0	59
				Total Economic Weight	**20**	**Economic Subtotal**			**126**	**0**	**131**
Social	SO1	Construction Impacts on the Community	Impacts on the community during construction (e.g., traffic, noise, dust)	**10** – No significant impacts **5** – Moderate impacts **1** – High impacts **0** – Extreme impacts	6	3	5	7	18	30	42
Social	SO2	Permanent Impacts on the Community	Permanent impacts on the community from installed facilities (e.g., visual, noise, odor). Change in public/recreational access.	**10** – No signficant impacts **5** – Moderate impacts **1** – High impacts **0** – Extreme impacts	8	6	5	8	48	40	64
Social	SO3	Ongoing Monitoring or Mitigation Required	Likely ongoing monitoring and/or mitigation requirements to offset impacts to the community	**10** – No ongoing monitoring/mitigation **5** – Moderate ongoing and/or compensatory monitoring/ mitigation **1** – High ongoing and/or compensatory monitoring/mitigation **0** – Extreme ongoing and/or compensatory monitoring/ mitigation	6	2	4	8	12	24	48
				Total Social Weight	**20**	**Social Subtotal**			**78**	**94**	**154**
Environmental	EV1	Construction or Operational Impacts on Sensitive Resources	Construction or operational impacts to specific sensitive environmental resources (e.g., vernal pools, cultural resources), or on overall water quality, air quality, or watershed protection.	**10** – No impact on endangered or threatened species **5** – Minimal impact on endangered or threatened species. Impact can be mitigated with off-site efforts **1** – Moderate impact on endangered or threatened species **0** – Significant impact on endangered or threatened species. Off-site mitigation not possible or not sufficent.	10	4	6	8	40	60	80
Environmental	EV2	Environmental Permitting Requirements	Ranking based on simplicity of permitting (i.e., shorter time required to obtain the permit), potential to avoid resources (and thus avoid permitting), and the predictability of obtaining a permit (some agencies are more difficult and unpredictable when it comes to issuing a permit).	**10** – Very simple to permit or avoid resources **5** – Some permitting, but obtainable in reasonable time **1** – Extensive permitting, obtainable in an extended time **0** – Difficult to impossible to permit	5	1	5	8	5	25	40
Environmental	EV3	Permanent Loss of Agricultural Land	Butte County has an overall goal of maintaining agricultural land, and some alternatives result in permanent loss of the ability to farm the land.	**10** – No permanent loss of ag land **5** – Moderate loss of ag land **1** – Significant loss of ag land **0** – Unacceptable loss of ag land	5	3	10	9	15	50	45
				Total Environmental Weight	**20**	**Environmental Subtotal**			**60**	**135**	**165**
Implementation	IM1	Obtaining Non-Environmental Permits or Regulatory Approvals	Difficulty in obtaining non-environmental permits or agency approvals (e.g., an initial NPDES permit, railroad or CalTrans crossing permits, CalWater approval of Miocene Canal alternative)	**10** – Very simple to obtain permits/approvals **5** – Significant permits/approvals, but obtainable in a reasonable time **1** – Extensive permits/approvals, obtainable in an extended time **0** – Difficult to impossible to permit	6	3	3	9	18	18	54
Implementation	IM2	Obtaining Political Approvals	Difficulty in obtaining political approvals or negotiating contracts	**10** – Strong support from involved parties involving positive negotiations **5** – Medium support involving extended negotiations **1** – Reluctance from one or more involved parties **0** – One or more parties refuse to participate	8	9	7	7	72	56	56
Implementation	IM3	Cooperation of Local Landowners	Willingness of local agricultural landowners to use treated wastewater, or willingness of local landowners to sell their land (i.e., "willing sellers")	**10** – Land owners eager to use recycle water or sell land, or no land owners involved **5** – Several land owners resistant **1** – Numerous land owners resistant **0** – Land owners likely to actively fight the project	6	3	3	8	18	18	48
				Total Implementation Weight	**20**	**Implementation Subtotal**			**108**	**92**	**158**
Operational	OP1	Legal and Regulatory Requirements	Stringent legal and regulatory requirements (e.g., risk of future regulatory violations/fines). Potential for future increases in regulatory requirements (e.g., NPDES dischage permit limits).	**10** – Project can readily meet future requirements **5** – Project somewhat succeptable to future requirements **1** – Project very succeptable to future regulatory requirements **0** – Project likely not able to meet future regulatory requirements	8	8	3	7	64	24	56
Operational	OP2	Technical Complexity	Complexity of operation and maintenance. Often relates to the technical complexity of a treatment facility.	**10** – Simple to operate and maintain **5** – Complex to operate and maintain **1** – Complex technologies requiring specially trained staff **0** – Very complex with high likelihood of O&M issues	6	5	2	9	30	12	54
Operational	OP3	System Flexibility	Increases options for Operations to maintain system service, or for Maintenance to maintain assets. Improves system ability to adapt to changing demand and future expansion. Removes system bottlenecks.	**10** – Numerous alternate operating modes **5** – Provides redundancy or an alternate operating mode **1** – Limited flexibility in responding to changes **0** – No flexibility in responding to changes	6	8	4	5	48	24	30
				Total Operational Weight	**20**	**Operational Subtotal**			**142**	**60**	**140**
				Total Weighting Factors	**100**				**Local - Land Application**	**Local - Miocene Canal**	**Regional**
						Total Weighted Score			514	381	**748**