

## **6. Water Systems**

### **6.1. Introduction**

Water service in Humboldt County is provided by a variety of suppliers. The major water supplier within the County is Humboldt Bay Municipal Water District (HBMWD), which wholesales water to three cities and four local service Districts. The remainder of the unincorporated area is served by a variety of independent special Districts (Community Services Districts, County Water Districts, and a Sanitary District), private systems (regulated by the state Public Utilities Commission), and mutual water companies (non-profit corporations that provide water at cost only to its shareholders or members), and individual private water systems using wells or surface water diversions.

This Section describes the potential for existing water systems to accommodate future growth within the various USAs and WSAs identified by the County. Existing demand and capacity, proposed and/or planned expansions, and potential constraints are described below. The infrastructure assessment within this Section draws from the information available within Table 1-5 and Table 1-6 in Section 1.

All costs presented herein are order of magnitude cost estimates and should not be interpreted as exact costs. No economies of scale or site-specific factors or constraints were taken into account in developing these cost estimates. However, the costs presented herein for the various service providers within the County are useful in identifying existing deficiencies and the need for better infrastructure planning to sustain these systems into the future. Some service providers have greater administrative capacity and have developed master plans, computer models, capital improvement plans, and rate studies for their water systems. However, many providers have significantly less capacity and therefore less technical, managerial, and financial planning perspective. Infrastructure upgrade recommendations made herein should be used as the basis for developing detailed, site-specific master plans, system models, and capital improvement plans. Detailed rate studies will need to be performed on an individual service provider level to determine the connection fees and usage rates required to generate sufficient revenues to maintain and sustain these systems into the future.

Funding sources for water systems are described in detail in Section 12.2.3.

### **6.2. System Standards**

#### **6.2.1. Water Quality Standards**

All public water systems are subject to the requirements of the State of California Health and Safety Code and are required to comply with the regulations established by the California Department of Health Services (DHS). These are detailed in the California Code of Regulations (CCR), Title 17 and Title 22, Division 4 and administered by the DHS, Division of Drinking Water and Environmental Management, District 01. The Drinking Water Program's office is located in Redding, CA. They are responsible for field inspections of water systems, issuance of operating permits, reviewing plans and specifications for new facilities, taking enforcement actions for non-compliance with laws and regulations, reviewing water quality monitoring results, and supporting and promoting water system security. Private water systems that qualify as public utilities are also

subject to California Public Utilities Commission (CPUC) standards for water service including minimum standards for design and construction outlined in CPUC General Order 103.

These same public water system standards apply to private water systems that serve over 25 people for more than 60 days per year. All private water systems within Humboldt County meet this criterion and are therefore subject to the standards described above.

### **6.2.2. California Waterworks Standards**

Source capacity, storage capacity, and distribution system standards are set forth in the Waterworks Standards regulations, outlined in the CCR, Title 22, Chapters 15 and 16, administered by the California DHS. Section 64554 – New and Existing Source Capacity states the following:

- (a) At all times, a public water system's water source(s) shall have the capacity to meet the system's maximum day demand (MDD). MDD shall be determined pursuant to subsection (b).
- (1) For systems with 1,000 or more service connections, the system shall be able to meet four hours of peak hourly demand (PHD) with source capacity, storage capacity, and/or emergency source connections.
- (2) For systems with less than 1,000 service connections, the system shall have storage capacity equal to or greater than MDD, unless the system can demonstrate that it has an additional source of supply or has an emergency source connection that can meet the MDD requirement.

These are the minimum standards that have been applied the Department of Health Services to facilities constructed by a water service provider. California Waterworks Standards relating to storage and distribution are principally health related and do not take into consideration fire flows (water that is available to fight a fire). In most instances, fire flow infrastructure requirements are in excess of the basic infrastructure required to provide adequate storage and distribution capacity to a community. When a developer is constructing a new subdivision, both health related and fire related standards would be applied.

### **6.2.3. California Fire Code**

The 2001 California Fire Code (CFC), Section 903, 103.1.3 outlines fire protection water requirements for residential properties. The Code requires fire hydrants be installed within 250 feet of residential homes. Required fire flows for residential homes equal to or less than 3,600 square feet is 1,000 gpm at 20 psi for 2 hours minimum. Minimum acceptable water main size is 6 inches in diameter, if this will provide the required fire flow. The code makes exceptions to the fire hydrant minimum distance for homes with built-in fire sprinkler systems. For these cases, the distance to a fire hydrant may be extended to 500 feet. Should the home be located greater than 500 feet away from the closest hydrant, the situation requires evaluation as to the "practical difficulty" of not meeting CFC regulations. Fire flow requirements for multifamily or commercial development are in excess of the single family requirements summarized above. Further information regarding minimum fire flows and fire hydrant standards are included in Appendix III-A and III-B of the CFC. Fire Code standards would be applied by the fire department at the time of subdivision or building permit review.

### **6.2.4. Development Standards**

All development within both unincorporated and incorporated areas within the County is subject to meeting minimum development standards for infrastructure. These minimum

standards are detailed in the Humboldt County General Plan and the Humboldt County Code Title III Land Use and Development Regulations and standards set forth and adopted by incorporated cities within the County. Generally for annexations to be considered, infrastructure within the potential annexed area must meet the minimum standards of the County. For example, McKinleyville requires all proposed annexations to be up to the District's sewer and water standards and would require improvements where there are deficiencies. Generally, a service provider would impose construction standards on new development either through adopted development standards or those adopted by other local agencies.

Most of the community water systems have been designed to provide fire protection and have some or all of their system components that meet the State requirements. While there are exceptions, these are primarily related to systems that were initially developed under private ownership or ones where the community has expanded beyond the initial service population without sufficient increases in their storage capacity. It should be an objective of the County's to have community water systems meet the State requirements for fire protection.

## **6.2.5. Methodology for Estimating Costs**

### **Unit Cost Estimates**

All infrastructure costs presented herein represent our opinion of the probable construction and soft costs (engineering, legal, administrative, etc.) in September 2007 dollars. The costs are "order of magnitude" costs, and actual costs will be higher or lower due to specific issues related to a particular project/site. For certain items, such as replacement of distribution system piping or finding new water sources, estimated costs are "guesstimates" as the specifics of the project will *dramatically* affect the costs of a particular project. These unit costs are more reflective of those associated with smaller projects and the unit cost will be lower as the size of the project increases. Therefore, costs presented herein are conservative, as no economy of scale is factored into the costs.

A uniform standard was used in making infrastructure upgrade recommendations for all USAs and WSAs. Although some systems within the County were designed to meet California Waterworks Standards, some were not designed with fire protection in mind. This is reflected by the fact that many communities have undersized water mains that do not provide adequate fire flows and generally do not have recommended fire flow storage.

The infrastructure assessment conducted for this General Plan Update uniformly applies recommended fire flow storage in addition to domestic use storage for one day of maximum day demand. All undersized distribution piping is also recommended for replacement. Infrastructure upgrade costs are shown distributed between existing deficiencies and future infrastructure needs to preliminarily differentiate between the two needs.

The following assumptions and methodology were used to estimate and distribute costs:

- **Storage costs** (Unit cost used in this analysis = \$2/gallon)
  - Existing storage must be sufficient to meet one day of domestic maximum day demands (maximum day demand varies according to use within each district) plus minimum recommended fire storage of 120,000 gallons (1,000 gallons per minute for two hours). If not, costs to bring storage to this level of standard are associated with existing development.

- Costs for future domestic storage are related to future development. In many cases, existing storage is sufficient to meet future demands, in which case future storage costs are minimized.
- **Treatment Costs** (Conventional treatment cost used in this analysis = \$5/gpd and Greensand/roughing filtration cost = \$2/gpd)
  - Existing treatment capacity must be sufficient to meet one day of maximum day demands. If not, costs to bring treatment capacity to this level are associated with existing development.
  - Costs for increased future treatment capacity are related to future development.
- **Source Costs** (Due to uncertainties new source costs are estimated broadly on a case by case basis)
  - Existing source capacity must be sufficient to meet one day of maximum day demands. If not, costs to bring source capacity to this level are associated with existing development.
  - Costs to increase source capacity in the future are related to future development.
- **Distribution Costs** (Unit cost used in this analysis = \$100/linear foot)
  - The existing distribution system must be adequate to serve existing development with domestic water and fire flow. The Department of Health Services Annual Inspection Report is used as the basis for distribution condition. Where condition is indicated to be “fair” or worse, or pipe size is indicated to be less than six inches in diameter (the minimum size that can provide adequate fire flow to residential uses), pipes are recommended to be replaced. Costs to bring the distribution system to this level are associated with existing development.
  - Costs for distribution systems related to new development are assumed to be paid at the time of construction and are not considered in this analysis.

### Presentation of Estimates

Total costs for correcting existing deficiencies, addressing changes in regulations, and constructing improvements to accommodate the Low and High development projections are estimated using the above methodology and are provided for each urban study area. Estimated costs are presented in table form along with system statistics such as the number of connections, available connections, and current system capacity. Costs are presented in the following manner: total estimated costs, costs per connection (total cost divided by the number of connections), and estimated financing cost per connection per month. The Low and High build-out costs are also added to the existing deficiencies in calculating estimated cost per connection and estimated financing cost per connection.

The estimated costs are based upon assumptions and the actual costs **will be different**. Funding for correcting existing deficiencies would likely come from grants and low interest loans, such as a State Revolving Fund loan which currently has loan terms of 20 years at 2.5 percent interest. In addition, we would expect actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

It should be noted that the estimated cost per connection **does not** represent a proposed connection fee and the estimated financing cost per connection per month **does not** represent a proposed change to rates. *These costs calculations are only provided to indicate the magnitude of the estimated costs in relation to the number of costumers. Future connections*

*should buy into the existing infrastructure through connection fees. These connection fees should be determined by the individual provider based on detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.*

Future rate studies should be conducted to determine the level of connection fees and usage charges needed to generate sufficient revenue to maintain an acceptable level of service and also capture sufficient replacement costs. These studies should also determine the appropriate methodology to allocate costs to future users for existing fire storage and an existing distribution system. These issues are not addressed at this planning level and are typically covered in master plans or project specific facilities plans prepared by each service provider.

### **6.3. Humboldt Bay Municipal Water District**

Humboldt Bay Municipal Water District (HBMWD) was formed in 1956 pursuant to the California Municipal Water District Act of 1911. The District was created to provide a reliable supply of water for both domestic and industrial purposes to customers surrounding the greater Humboldt Bay area.

Current facilities and operations of the District include: 1) the R.W. Matthews Dam which forms Ruth Reservoir in southern Trinity County, 2) the Gosselin hydro-electric power house at Matthews Dam, 3) diversion, pumping, and control facilities adjacent to the Mad River at Essex (at the John R. Winzler Pumping and Control Center), 4) storage and treatment facilities, and 5) two separate and distinct pipeline systems which deliver treated drinking water or untreated raw water to the District's customers.

Today, HBMWD provides treated drinking water on a wholesale basis to seven municipal agencies in the greater Humboldt Bay region. The District's wholesale municipal customers are: the City of Arcata, the City of Eureka, the City of Blue Lake, the Fieldbrook-Glendale CSD, Humboldt CSD, Manila CSD, and McKinleyville CSD. Via this wholesale relationship, the District serves water to a population of approximately 80,000 people, representing 60% of the current Humboldt County population. The District also retails water to approximately 180 customers (located in the West End Road and Fairhaven areas), delivering on average approximately 0.426 MGD. The Town of Samoa, which contains approximately 96 housing units and some commercial structures, is also a retail customer.

The District also supplies untreated, raw water to customer(s) located on the Samoa Peninsula for industrial purposes. Formerly, the District supplied raw water to two pulp mills, which for many years contracted with the District for 60 million gallons per day (MGD) of water (the maximum capability of the District's industrial pumping and delivery system). Today, the District serves only one industrial customer – Evergreen Pulp Inc. They have a contract with the District for 15 MGD, one quarter of the industrial system's current capacity.

Historically, the District has developed a very detailed annual budget plan that has focused very well on planning needs. In 2007, the District developed a new Capital Improvement Plan (CIP) that addresses and defines proposed infrastructure projects over a 20-year planning horizon. The CIP is based on a policy framework, with a ranking methodology to help prioritize project needs. The CIP identifies infrastructure upgrades needed for existing infrastructure ranked on remaining

useful life, importance, and redundancy. Other projects identified by the CIP are either system growth-induced projects or system upgrade projects.

It is anticipated that the demands for domestic water will exceed the currently available capacity within the planning time frame of this document, based on County housing and corresponding population projections. While the District has excess water available in its industrial system, they will require either expansion of or upgrades to the existing Ranney collectors and treatment facilities to increase the capacity of their domestic water system. In addition, improvements to their transmission system, including replacement of the 15-inch and 18-inch Techite pipelines on the Samoa peninsula, will need to be completed to fully serve future development. The District is also currently exploring options to increase the life of the District's infrastructure and to potentially add capacity to continue to provide a reliable, safe source of drinking water to its customers. It is anticipated that the costs for these improvements will be significant and will be better defined over the next year.

## 6.4. Urban Study Areas

Urban study areas (USAs) are regions within the County either already served by both water and sewer systems or are under consideration for these services. Water study areas (WSAs) are regions within the County that have community water systems or areas where it may be appropriate to expand existing systems, and are covered in more detail in Section 6.5. The County's purpose in defining urban study areas is to identify areas for more detailed planning and analysis, mainly with respect to development capacity and the infrastructure required to service both existing and any further development that may occur within these areas. As a part of this effort, the County is working collaboratively with the special Districts to refine information regarding development potential and allow for more informed development timing policies within the County. See Chapter 1, Introduction, for additional information regarding Urban Study Areas.

The following sections introduce the County's USAs and WSAs and provide a detailed discussion on development potential and water infrastructure assessment for each study area. Water system infrastructure deficiencies will be identified along with plans for timing and financing of needed improvements. Some study areas consist of both an urban study area and water study area. In these instances, the water study area will be described in conjunction with the urban study area in this section.

USAs and WSAs for the most part share the name of the service district that provides water and wastewater service. The Humboldt Community Services District (HCSD) serves a population of approximately 20,000 and has the County's largest and most diverse service area. Because the characteristics of the communities within and adjacent to the boundaries of the HCSD vary considerably, this district has been divided into multiple USAs and WSAs with names reflecting the community and not the name of the service provider. The following USAs and WSAs have been evaluated with respect to HCSD:

- Freshwater WSA
- Humboldt Hill USA
- Indianola WSA
- Myrtle town USA & WSA
- South Eureka USA & WSA

The evaluations of USAs and WSAs in this Chapter and their respective water systems are presented in alphabetical order. To simplify the discussion of the HCSD service area, all of the USAs and WSAs within or adjacent to HCSD are presented together in Section 6.6 of this Chapter. Section 6.6 follows the discussion of the water systems located in the other USAs and WSAs.

All discussions of sewer service in the study areas follows in Chapter 7.

### **6.4.1. Arcata USA**

The County estimates there were 190 housing units within the Arcata USA in 2005. Based on the estimated range of housing growth projections of between 0.5% and 2.5%, the Arcata USA could have between 210 and 311 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is 395 housing units. Therefore, the fair share growth projections for the Arcata USA are within the range of what the land can bear.

The high build-out estimate of 395 total housing units for the USA was used for infrastructure assessment and recommendations. This represents 205 new housing units within the Arcata USA.

#### **6.4.1.1. Summary**

##### **Findings**

The City of Arcata's water system is in need of infrastructure upgrades for existing development in addition to future development. Lack of storage is the City's main existing deficiency. The City's distribution system also contains pipe in fair condition, including some steel and AC pipe that will likely need replacement in the near future. The Arcata USA is expected to receive approximately 150 additional units within the next ten years with the proposed Creekside Homes annexation, and another 55 units to reach build-out conditions, for a combined increase of 205 units.

##### **Existing Capacity**

The City of Arcata's water system is not limited by either source or treatment capacity with respect to its availability of connections. HBMWD has sufficient water supply to meet City demands.

##### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Arcata USA and addresses infrastructure needs for existing development served by the City of Arcata and for build-out conditions. The existing capacity of the system includes connections within the City of Arcata as well.

**Table 6-1. Water system infrastructure assessment for the Arcata USA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	6,000
# of Available Connections <sup>1</sup>	---
Source Capacity (MGD)	Not limiting (HBMWD)
Storage Capacity (MG)	4.6
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	3.405
Usage Rate (gpd/connection)	567.5
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Replace distribution piping – 29 miles <sup>2</sup></i>	\$15,312,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$15,312,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$2,552</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$13.64</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections <sup>3</sup>	2
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed <sup>4</sup></i>	\$0
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$0</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$0</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$15,312,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$2,551</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$13.64</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections <sup>3</sup>	205
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed <sup>4</sup></i>	\$0
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$0</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$0</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$15,312,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$2,468</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$13.19</b>

NOTES: <sup>1</sup> There is sufficient source supply from HBMWD to serve all development potential within the USA.

<sup>2</sup> According to the DHS annual inspection report, approximately 38% of the 76.5 miles of distribution system is steel (coated and uncoated) and cast iron pipe in fair condition.

<sup>3</sup> New connections shown are in Arcata USA and do not include new connections within the City.

<sup>4</sup> Existing storage is sufficient to meet both existing and future domestic and fire storage requirements. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$15.3 million loan would amount to approximately \$982,000 per year. With 6,000 existing ratepayers, monthly bills would have to be increased by approximately \$14 per month to fund this loan. In reality, we would expect the City to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing

deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.1.2. Description of Urban Study Area**

A map showing Arcata's USAs is attached as Figure 6-1. There are a total of five areas within the City's sphere of influence that comprise the Arcata USA. These include (from south to north):

1. An area just south of the existing Windsong subdivision near the intersection of State Route 255 and V Street.
2. An area of proposed development known as Creekside Homes.
3. A subdivision known as Pacific Manor just west of Janes Road.
4. A commercial area near Granite gravel yard north of Giuntoli and east of U.S. 101, in the Valley West neighborhood.
5. A light industrial area near Almqvist Lumber along Boyd Road near State Route 299, near the existing Aldergrove Industrial Park.

The Arcata USA has 178 total acres, of which 22 acres are underdeveloped and/or vacant parcels. Of this total acreage, 12 acres within the USA are developable. With respect to development potential, the area south of Windsong and the proposed Creekside Homes development are the only portions of the Arcata USA that may receive residential development. The Pacific Manor subdivision is already built out, and is included as part of the USA because the County would like to see this area serviced by sewer and annexed to the City. The Valley West and Aldergrove USAs represent industrial and commercial development potential only.

The entire Arcata USA is not within the service boundaries of a water or wastewater provider. The area south of Windsong and the commercial area along Giuntoli Lane are located within the coastal zone and subject to the Humboldt Bay Area Local Coastal Program. The other areas are subject to the Arcata Community Plan. To the extent that these areas are annexed to Arcata, the land use guidelines and development potential would be governed by the City of Arcata General Plan, which was updated in 2000 (although the Arcata Local Coastal Program is not yet certified by the California Coastal Commission). Proposed development will be concentrated within the proposed Creekside Homes development and the area south of Windsong Village. The estimated development potential for these areas can only be realized if these parcels are annexed to the City and receive municipal water and wastewater service.

#### **6.4.1.3. Water System Service Area Description**

All portions of the Arcata USA are expected to receive water service from the City of Arcata. The City of Arcata's existing service area includes all lands within the City limits as shown in Figure 6-1 and the Jacoby Creek County Water District (see the Jacoby Creek WSA for additional detail).

## System Standards

The City of Arcata's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

The City of Arcata has established improvement standards for all City owned infrastructure. For any proposed annexation, new infrastructure development would be subject to these standards and existing infrastructure may be required to be upgraded.

## Fiscal Condition/Capital Replacement Program

According to City of Arcata records, they operate their water system on an annual budget of approximately \$3.5 million. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The City's budget indicates that the development of a five-year Capital Improvement Plan is a goal for this budget year.

## Water Demand

According to 2005/2006 HBMWD records, the City of Arcata's average daily use was 1.825 MGD and peak daily use was 3.405 MGD. The City delivered over 676 million gallons of HBMWD water in fiscal year 2005/2006. The City has approximately 6,000 existing connections and also supplies water to Jacoby Creek County Water District (City of Arcata, 2005).

## Water Supply, Treatment, Distribution and Storage

The City's water supply comes from both water purchases from HBMWD and from a City owned water well known as the Heindon Well, which has a capacity of approximately 350 gpm (0.504 MGD). Approximately 20% of the City's supply comes from this groundwater source. The City is currently contracted with HBMWD to receive a peak water allocation of 3.25 MGD. Water is delivered through 76.5 miles of water distribution mains and storage reservoirs located throughout the community. The City has approximately 4.4 million gallons of storage capacity spread over 17 tanks ranging in size from 15,000 gallons to 1.5 million gallons.

## Condition Assessment

**Overview.** The City of Arcata's water system is in good condition overall. Peak daily use of HBMWD water for the City (3.405 MGD in 2005/2006) currently exceeds their peak rate allocation of 3.25 MGD set in contract with HBMWD on July 1, 2006. However, the City has an additional, approximate 0.5 MGD available from the Heindon well.

**Current Deficiencies.** The City's main deficiency with respect to its water system is the lack of adequate storage within some pressure zones. Seventy-five percent of Arcata's customers are serviced from Zone I where the City has 2.2 million gallons of storage. This 2.2 million gallons then feeds a series of upper tanks to make up the additional 2.4 million gallons. Because of the low storage to demand ratio, the system calls on HBMWD to fill tanks on a much more frequent basis causing excess wear on pumps, filters and valves and the inability to control energy use (County of Humboldt, 2005). The City's lack of storage requires HBMWD to pump during times of peak power usage, thereby increasing operational costs for the District and its other wholesale customers.

**Underserved Areas.** The City serves all areas within its service boundaries.

## Proposed Improvements

**System Upgrades.** The City plans on installing additional storage capacity. Plans for approximately one million gallons of storage within the new Sunnybrae tract of the Arcata Community Forest are underway. An additional four million gallons of storage are planned for Zone 1. The City is also looking into a second connection with HBMWD.

**Future Expansion.** The Arcata General Plan indicates that the Urban Services Boundary is the area where urban development may occur during the General Plan's twenty-year time frame (by 2020). The Arcata USA is located within the Arcata Urban Services Boundary, and it is likely that the areas within the Arcata USA would be annexed and developed within the General Plan period. Because the Pacific Manor subdivision is already built-out, annexation to the City may be more difficult. The City's established development standards may make this annexation more difficult as well.

**Cost and Schedule of Improvements.** The City has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system. However, the City has the following water system goals for this fiscal year:

- 1) Develop a 5-year capital improvement program for water distribution improvements and maintenance;
- 2) Continue to reduce unaccounted system losses through repair of substandard transmission lines and perform a water audit (ongoing);
- 3) Continue to improve GIS accuracy and implement valve exercise program;
- 4) Continue to train staff to meet State requirements for water distribution system;
- 5) Install Humboldt Bay Municipal Water District tie-in at Aldergrove Road; and
- 6) Locate suitable water storage tank sites in Zone 1.

### 6.4.2. Blue Lake USA & WSA

The Blue Lake study area contains both a USA and WSA. The County estimates there were 78 and 108 housing units within the Blue Lake USA and WSA, respectively in 2005. Based on the County's range of housing growth projections of between 0.5% and 2.5%, the Blue Lake USA could have between 86 and 128 total housing units by 2025, while the Blue Lake WSA could have between 119 and 177 total housing units by 2025. However, according to Table 1-6, the high build-out estimate for total development potential within the Blue Lake WSA, which takes into consideration physical and zoning constraints, is only 126. Therefore, the growth rate projections for the Blue Lake WSA are in excess of what the land can bear unless some parcels are changed in terms of land use and zoning to allow for higher residential densities. The high build-out estimate for total development potential within the Blue Lake USA, which takes into consideration physical and zoning constraints, is 221 total housing units.

The high build-out estimate for total development potential within the USA and WSA was used for infrastructure assessment and recommendations. This represents a combined 161 new housing units within the Blue Lake USA and WSA.

#### 6.4.2.1. Summary

##### Findings

The City of Blue Lake's water system is in good condition. There are no major deficiencies associated with the existing system and the existing development they serve. However, the Blue Lake USA is expected to receive an additional 161 units before reaching build-out conditions. The City of Blue Lake will need to expand its water system infrastructure to serve this additional

growth, and also upgrade and replace deteriorating infrastructure as needed since the original water distribution system was installed in 1973.

**Existing Capacity**

The City of Blue Lake's water system is not limited by either source or treatment capacity with respect to its availability of connections. HBMWD has sufficient water supply to meet City demands.

**Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Blue Lake USA/WSA and addresses infrastructure needs for existing development served by the City of Blue Lake and for build-out conditions. The existing capacity of the system includes connections within the City of Blue Lake as well.

**Table 6-2. Water system infrastructure assessment for the Blue Lake USA/WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	650
# of Available Connections <sup>1</sup>	---
Source Capacity (MGD)	Not limiting (HBMWD)
Storage Capacity (MG)	0.9
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.378
Usage Rate (gpd/connection)	582
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed</i> <sup>2,3</sup>	\$0
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$0</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$0</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$0</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	52
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed</i> <sup>2,3</sup>	\$0
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$0</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$0</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$0</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$0</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$0</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	161
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed</i> <sup>2,3</sup>	\$0
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$0</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$0</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$0</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$0</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$0</b>

NOTES: <sup>1</sup> There is sufficient source supply from HBMWD to serve all development potential within the USA.

<sup>2</sup> Existing storage is sufficient to meet both existing and future domestic and fire storage requirements.

<sup>3</sup> According to the DHS annual inspection report, the distribution system is all in good condition. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

No financing of infrastructure is needed for existing or future build-out conditions. Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.2.2. Description of Urban Study Area**

A map showing the Blue Lake USA and WSA is attached as Figure 6-2. The Blue Lake USA comprises two areas within the City's sphere of influence, located on the southeastern and northeastern boundaries of the City. The Blue Lake WSA is also located within the City's sphere of influence and wraps around the eastern and northern boundaries of the City.

The Blue Lake USA has 94 total acres, of which 73 acres are underdeveloped and/or vacant parcels. Of this total acreage, 50 acres within the USA are developable. The Blue Lake WSA has 238 total acres, of which 91 are underdeveloped and/or vacant parcels. Of this acreage, only 85 acres within the WSA are developable. With respect to development potential, the majority of the Blue Lake USA consists of underdeveloped residential parcels, while the WSA contains both underdeveloped and vacant residential parcels.

The City of Blue Lake is the only local service provider. Without annexation, or the extension of City services outside its boundaries, additional residential development would require on-site water and wastewater. Upon annexation, the land use guidelines and development potential are covered in the City of Blue Lake General Plan, which was last updated in 1986.

#### **6.4.2.3. Water System**

##### **Service Area Description**

Both the Blue Lake USA and WSA will require annexation into the City of Blue Lake in order to receive water services for any proposed development in this area. The City of Blue Lake's existing service area includes all lands within the City limits as shown in Figure 6-2, in addition to some connections outside of the City limits.

##### **System Standards**

The City of Blue Lake's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards

##### **Fiscal Condition/Capital Replacement Program**

According to City of Blue Lake records, they operate their water system on an annual budget of approximately \$260,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The City has not developed a Capital Improvement Plan to date, and they currently do not have built up reserves.

## Water Demand

According to 2005/2006 HBMWD records, the City of Blue Lake's average daily use was 0.223 MGD and peak daily use was 0.378 MGD. The City delivered over 84 million gallons of water in fiscal year 2005/2006. The City has approximately 650 existing connections and does not retail water to any other Districts.

## Water Supply, Treatment, Distribution and Storage

The City's receives its water supply through contract with HBMWD. Water is delivered through an unknown length of water distribution mains and storage reservoirs located throughout the community. The City has approximately 0.9 MG of storage capacity spread over two redwood tanks ranging in size from 400,000 gallons to 500,000 gallons.

## Condition Assessment

**Overview.** The City of Blue Lake's water system is in good condition overall. Peak daily use of HBMWD water for the City (0.378 MGD in 2005/2006) is currently less than their peak rate allocation of 0.50 MGD set in contract with HBMWD on July 1, 2006.

**Current Deficiencies.** There are no significant deficiencies within the City's water system.

**Underserved Areas.** The City serves all areas within its service boundaries.

## Proposed Improvements

**System Upgrades.** The City has no major upgrades planned other than routine maintenance and has not developed a CIP. The City does hope to loop two portions of the distribution system – one looping Accacia Ct. to Railroad Ave. and one looping the Greenhill area to the main line leading from the booster pump station.

**Future Expansion.** The City of Blue Lake prepared an annexation plan that would expand the City boundaries to include all of the existing SOI. An initial fiscal analysis indicated that the proposed annexation would result in a net fiscal impact to the City. Until the City can ensure fiscal balance upon annexation, it is not interested in expanding services or City boundaries. However, the City feels it is capable of serving additional growth at the current rate of development.

**Cost and Schedule of Improvements.** The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

### 6.4.3. Fortuna USA

The County estimates there were 640 housing units within the Fortuna USA in 2005. Based on the County's projected housing growth rate of between 0.5% and 2.5%, the Fortuna USA could have between 707 and 1,049 total housing units by 2025. According to Table 1-6, the low and high estimates for total build-out potential within the Fortuna USA, which takes into consideration physical and zoning constraints, there could be between 934 and 1,090 total housing units at build-out. Therefore, the growth projections for the Fortuna USA are within the range of what the land can bear.

The high build-out estimate for total development potential of 1,090 housing units in the USA was used for infrastructure assessment and recommendations. This represents 450 new housing units within the Fortuna USA. It should also be acknowledged that Fortuna plans significant future development within its current City boundaries.

### **6.4.3.1. Summary**

#### **Findings**

The City of Fortuna's water system is in good condition. There are no major deficiencies associated with the City's water supply and distribution system. City of Fortuna annual pumping records indicate that current water demand is approximately 94% of permitted capacity, and there are approximately 257 available connections. However, according to Table 6-2, the Fortuna USA could receive up to 450 new housing units before reaching build-out conditions. It is anticipated that the majority of Fortuna growth will occur within the City limits (outside the USA), and that the City will need to expand its water system infrastructure to serve this additional growth as well as growth within the USA. In addition, the City of Fortuna may need to seek permits from DWR for additional source capacity

#### **Existing Capacity**

The City of Fortuna's water system is limited by water rights. . According to the City of Fortuna General Plan Draft Environmental Impact Report (State Clearing House No. 2007062106) the maximum permitted diversion of Eel River underflow water is three cubic ft/second and the total annual diversion is 1,642 acre feet. Discussions with the California Department of Public Health, Drinking Water Programs and Section 7.1, Water Supply and Distribution, of the Fortuna General Plan EIR indicate that the volume of water diverted from the Eel River underflow by the City is not determined. Based solely on the Department of Water Resources Division of Water Rights diversion permit, the City is currently extracting approximately 74% of its permitted water rights (based on an average annual total pumping volume over the last five years of 505.6 million gallons, or 1,550 acre feet and a total permitted capacity of 1,642 acre feet per year). Therefore there are approximately 257 available connections before the City would exceed its permitted water rights. The Fortuna General Plan EIR included a mitigation measure that adds a new General Plan policy requiring the city to renew or amend its permit to accommodate existing and projected municipal water usage.

#### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Fortuna USA and addresses infrastructure needs for existing development served by the City of Fortuna and for build-out conditions. Planning for future developments within the USA for the next 10-year horizon is not available and therefore was not assessed. The existing capacity of the system includes connections within the City of Fortuna as well.

**Table 6-3. Water system infrastructure assessment for the Fortuna USA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	4,331
# of Available Connections <sup>1</sup>	257
Source Capacity (MGD)	3.17
Storage Capacity (MG)	7.3
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	2.3
Usage Rate (gpd/connection)	543
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed</i> <sup>2,3</sup>	\$0
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$0</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$0</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$0</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	294
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed</i> <sup>2,3</sup>	\$Unknown
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$Unknown</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$Unknown</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$Unknown</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$Unknown</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$Unknown</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	450
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>\$Unknown</i>	\$0
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$Unknown</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$Unknown</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$Unknown</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$Unknown</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$Unknown</b>

NOTES: <sup>1</sup> The City of Fortuna is estimated to be at 94% of its permitted water rights, derived using an assumed maximum day source capacity of 3.17 MGD, based on the maximum permitted diversion rate of three cubic feet per second (according to DWR permit #12390) over a 24 hour period..

<sup>2</sup> Existing storage is sufficient to meet both existing and future domestic and fire storage requirements.

<sup>3</sup> According to the DHS annual inspection report, the distribution system is all in good condition. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

Due to uncertainties associated with increasing the City of Fortuna's source capacity, costs for future improvements were not estimated. However, funding for this infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.3.2. Description of Urban Study Area**

A map showing Fortuna's USAs is attached as Figure 6-3. The Fortuna USA contains four separate areas that are located within the City's sphere of influence. These include (from south to north):

1. An area south and east of Rohnerville, which includes the Rohnerville airport.
2. An area on the northeastern edge of Fortuna, just north and east of Nelson Lane.
3. An area north of Fortuna known as Carson Woods, located just north of Rohner Park.
4. An area northwest of Fortuna, stretching from U.S. 101 into the hills north and east of the highway and including areas currently served by Palmer Creek CSD.

The Palmer Creek CSD is the only service provider within the Fortuna USA. The Palmer Creek CSD provides water and wastewater services.

The Fortuna USA has 3,587 total acres, of which 1,414 acres are underdeveloped and/or vacant parcels. Of this total acreage, 888 acres within the USA are developable. With respect to development potential, about 30% of the parcels within the Fortuna USA are considered vacant and underdeveloped parcels that could see further residential development. However, aside from areas served by the Palmer Creek CSD, the Fortuna USA is not within the boundaries of a water or wastewater provider. Development potential would be limited by the requirement to use on-site water and septic disposal systems without annexation to the City of Fortuna and the extension of City water and wastewater services. Upon annexation, the Fortuna USA would be governed by the City of Fortuna General Plan, which is currently in the process of being updated and is expected to be adopted in 2007.

#### **6.4.3.3. Water System**

##### **Service Area Description**

Aside from the Palmer Creek CSD area, additional residential development within the Fortuna USA would require the construction of on-site water systems or would receive water service from the City of Fortuna upon annexation. The City of Fortuna's existing service area includes all lands within the City limits as shown in Figure 6-3.

##### **System Standards**

Both the Palmer Creek CSD and the City of Fortuna's water systems are public water systems, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

The City of Fortuna has established improvement standards for all City owned infrastructure. To the extent that new development areas are annexed to the City, infrastructure development would be subject to these standards. To the extent that existing development is annexed, the City of Fortuna may apply existing development standards and require that all existing infrastructure be upgraded.

## **Fiscal Condition/Capital Replacement Program**

According to City of Fortuna records, they operate their water system on an annual budget of approximately \$1.1 million. The majority of this income is from service charges, but funding also comes from, assessments, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The City's latest Capital Improvement Plan was developed in 2007, and the City's reserves status is unknown. The City is currently preparing a 20-year capital improvement program that will likely address improvements associated with future permit and source capacity expansion and other water system capacity projects.

According to Palmer Creek records, they operate their water system on an annual budget of approximately \$74,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have approximately \$127,000 in reserves.

## **Water Demand**

According to the Fortuna General Plan Background Report, the City produced an average of 505.6 million gallons of drinking water per year between 2003 and 2007, and 503.7 million gallons in 2007. Average daily use is therefore estimated at 1.39 MGD. Peak daily use for 2005 was reported as 2.3 MGD in the 2007 DHS annual inspection report. The City has approximately 4,331 existing connections and does not retail water to any other Districts.

Palmer Creek CSD produced more than 11 million gallons of drinking water in 2003. Average daily use is estimated at approximately 0.031 MGD, and peak daily use is reported at approximately 0.084 MGD. The District has approximately 150 service connections, of which 127 are active connections. All active connections are metered.

## **Water Supply, Treatment, Distribution and Storage**

The City's water supply comes entirely from five groundwater wells (four active and one emergency stand-by) located at the City's corrosion control facility. The combined rated capacity of all wells is 2,200 gpm, or 3.17 MGD. Water is chlorinated in the wells as a precautionary measure due to the annular seals being less than 50 feet deep and then pumped from the wells into a 120,000 gallon tank, containing three 100 horsepower booster pumps that pump water into the City's distribution system. The distribution system is divided up into eight pressure zones and contains a series of pumps, water tanks, reservoirs, and hydropneumatic tanks. The combined storage capacity of the system is approximately 7.3 million gallons. Some pressure zones do not have adequate storage, but can be provided water through booster stations with portable generators on site. The City's distribution system consists of approximately 38 miles of PVC, asbestos cement, and cast iron pipe ranging in size from 2 inches to 10 inches and in good condition.

Palmer Creek CSD's water supply consists of two active wells, each capable of pumping 80 gpm. Water pumped from the wells is injected with sodium hypochlorite and then sent to a contact basin prior to filtration through a Loprest package treatment plant designed to remove iron and manganese from the groundwater. The plant consists of a reaction vessel and three pressure filters, after which water is boosted to storage and distribution. The District has one 200,000 gallon storage tank that serves two pressure zones; one has reduced pressures through a PRV. The District's distribution system was installed in 1997 and consists of approximately four

miles of PVC pipe ranging in size from 2 inches to 10 inches. The system has capacity for adequate fire flows.

### **Condition Assessment**

**Overview.** The City of Fortuna's water system is in good condition overall but does not have sufficient capacity to accommodate growth anticipated in Fortuna's new General Plan currently in the process of being updated, nor the Fortuna USA. The City is assessing whether or not it has sufficient water supply, as set forth by the State of California in its water rights permit, to accommodate anticipated growth. The City is currently allowed by permit to extract slightly over 535.1 million gallons per year, or approximately 6% more water than the 505.6 million gallons per year currently being extracted. Current peak day demands (2.30 MGD) are about 73% of source capacity (3.17 MGD based on three cubic feet/second maximum diversion rate) during peak usage periods. The City is therefore limited by water rights and source capacity, but it appears that water rights are more limiting.

Palmer Creek CSD's water system is in excellent condition as it was constructed in 1997.

**Current Deficiencies.** The City currently has areas where fire flow capacities need to be improved. Some older sections of the City's distribution system are in need of replacement. Many sections of steel pipe have failed as a result of excessive corrosion problems the City used to have prior to completion of its corrosion control facility. Most of the old, leaking mains have been replaced by past projects.

Palmer Creek CSD's water system has known existing deficiencies, including dead end mains and limited fire flow capacity at the end of Page Way.

**Underserved Areas.** The City and Palmer Creek CSD both serve all areas within their respective service boundaries.

### **Proposed Improvements**

**System Upgrades.** The City completed a hydraulic study in 2005 which was updated in 2007, and made recommendations for improvements to the water system. These mainly include upgrades to existing reservoirs and storage tanks and construction of new reservoirs and storage tanks. Some pumps are also in need of replacement, and a new booster station is needed at the Loop Road Development (City of Fortuna, 2005). These are covered in greater detail in Fortuna's General Plan Update.

Palmer Creek CSD has no major system upgrades planned other than upgrades to their computer software.

**Future Expansion.** The City of Fortuna is looking to annex most of the areas within the USAs within the time frame of this General Plan, with the exception of the portion of the USA currently served by Palmer Creek CSD. The State forced Fortuna to accept Palmer Creek into its sphere of influence and take sewage from Palmer Creek's collection system. Fortuna requires all proposed annexations to be up to Fortuna's sewer/water/roads standards and would require a new assessment district where there are deficiencies.

Palmer Creek CSD has no plans for future expansion although landowners located at the edge of the district have requested water service.

**Cost and Schedule of Improvements.** The City of Fortuna has a Capital Improvement Plan that covers costs and schedules for improvements to its water system over the next five years and is preparing a 20-year capital improvement program. These include routine maintenance activities in addition to improvements to water distribution and storage. Total costs for the CIP is nearly \$8 million dollars, of which approximately 12% will be covered through reserves built in the water fund and the remaining 88% will be covered through bonds.

Palmer Creek CSD does not have a CIP in effect.

#### **6.4.4. Garberville USA and WSA**

The Garberville study area contains both a USA and WSA. The County estimates there were 297 and 147 housing units within the Garberville USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Garberville USA could have between 328 and 487 total housing units by 2025, while the Garberville WSA could have between 162 and 241 total housing units by 2025. However, according to Table 1-6, the high build-out estimate for total development potential within the Garberville USA and WSA, which takes into consideration physical and zoning constraints, is 405 and 250, respectively. Therefore, although the Garberville WSA can be expected to have between 162 and 241 total housing units by 2025, the high growth rate projection for the Garberville USA is greater than what the land can bear.

The high build-out estimate for total development potential of 405 and 250 housing units in the USA and WSA, respectively, was used for infrastructure assessment and recommendations. This represents 211 new housing units within the Garberville USA and WSA combined.

##### **6.4.4.1. Summary**

##### **Findings**

Garberville's water system, which until recently was privately owned, is in poor to fair condition. Generally, systems that were originally privately owned and developed are not constructed to the same standards as ones developed by public agencies. Major deficiencies associated with the existing system include lack of storage capacity, standby power, and an aging and undersized distribution system, most of which was installed in the 1930s. Additionally, the Garberville USA and WSA are expected to receive up to 211 new housing units before reaching build-out conditions. Garberville will need to upgrade and expand its water system infrastructure to serve this additional growth.

It is recommended that the District expand its SOI to include the Kimtu area, to the end of Camp Kimtu Road southwest of Garberville, to facilitate the improvement of the health, safety and water quality of the area. It is also recommended that at least those areas currently receiving GSD service within the existing SOI be included within the GSD boundaries to bring district infrastructure into its district boundaries and to allow for future infrastructure improvements. Annexation of the WSA areas within the GSD SOI would be required to facilitate planned development.

##### **Existing Capacity**

Garberville's water system is currently limited by both its source and treatment capacity with respect to the number of available connections. However, treatment capacity is currently more limiting. Source capacity is limited by the existing pumps and is approximately 0.46 MGD if the pumps are operated 24 hours per day. The treatment capacity is limited by filtration and is estimated at 0.33 MGD if the filters are operated 22 hours per day (time allowed for backwash cycle). Given existing maximum day demands are 0.31 MGD, the system is operating at

approximately 94% of treatment capacity. Therefore, there are approximately 25 available connections under the existing infrastructure.

### Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Garberville USA/WSA and addresses infrastructure needs for existing development served by the Garberville Sanitary District and for build-out conditions. There are no planned developments within the USA/WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-4. Water system infrastructure assessment for the Garberville USA and WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	394
# of Available Connections <sup>1</sup>	25
Source Capacity (MGD)	0.461
Storage Capacity (MG)	0.270
Treatment Capacity (MGD)	0.330
Peak Day Use (MGD)	0.310
Usage Rate (gpd/connection)	787
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.16 MG <sup>2</sup></i>	\$320,000
<i>Upgrade distribution system – 10.5 miles <sup>3</sup></i>	\$5,544,000
<i>Install backup power</i>	\$250,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$6,114,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$15,518</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$82.95</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	124
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.098 MG <sup>2</sup></i>	\$196,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$196,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$1,581</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$6,310,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$12,182</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$65.12</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	211
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.166 MG <sup>4</sup></i>	\$332,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$332,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$1,574</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$6,446,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$10,655</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$56.95</b>

NOTES: <sup>1</sup> The number of available connections in the Garberville study areas was estimated based on the District currently being at 94% of its treatment capacity.

<sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.310 MG) plus minimum fire storage of 0.12 MG minus existing storage (0.27 MG).

<sup>3</sup> According to the District, approximately 70% of the distribution system is in need of replacement. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

<sup>4</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 787 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$6.1 million loan would amount to approximately \$392,000 per year. With 394 existing ratepayers, monthly bills would have to be increased by \$83 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale, as evidenced by the lower monthly financing costs shown under the low and high build-out scenarios.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.4.2. Description of Urban Study Area**

A map showing the Garberville USA and Garberville WSA is attached as Figure 6-4. The USA encompasses Garberville's commercial downtown area and surrounding residential areas. The WSA extends southwest of the USA and includes residential lands on both sides of the South Fork Eel River.

The Garberville USA has 740 total acres, of which 129 acres are underdeveloped and/or vacant parcels. Of this total acreage, 79 acres within the USA are developable. The Garberville WSA has 1,571 total acres, of which 1,099 acres are underdeveloped and/or vacant parcels. Of this total acreage, 483 acres within the WSA are developable. With respect to development potential, approximately 15% of parcels within the Garberville USA are considered vacant or underdeveloped parcels that could see further residential development. The WSA also contains large vacant and underdeveloped parcels.

The USA boundary generally matches the district boundaries of the Garberville Sanitary District (GSD), extending beyond the district boundaries into the GSD sphere of influence in the Hillcrest Road area in the south and on the west side of Garberville in the area of the GSD wastewater treatment plant and the Caltrans maintenance yard. The GSD treatment plant is located within the district SOI, whereas the Caltrans yard area is located outside the district and SOI.

The WSA boundary generally follows the GSD SOI, which extends southwest from the Garberville downtown area to the Garberville Airport. The WSA extends beyond the GSD SOI to the Kimtu area southwest of Garberville.

The area's land use guidelines and development potential are covered in the Garberville, Redway, Benbow, and Alderpoint Community Plan, which was adopted in June 1987.

### **6.4.4.3. Water System**

#### **Service Area Description**

The Garberville USA and portions of the WSA receive water service from GSD, while the remainder of the Garberville WSA relies on private water sources for drinking water. The GSD water system extends beyond the GSD district boundaries southwest of the downtown Garberville area to the Leino Road area. There are also customer-owned water lines supplied by GSD that extend up Connick Creek Road on the west side of the Eel River.

The GSD was formed on April 12, 1932, pursuant to "The Sanitary District Act of 1923" after a majority vote was cast in a general election. The Garberville Sanitary District is an independent special District with a five-member Board of Directors elected to staggered four year terms. The GSD was originally formed to provide sewer service, but purchased the Garberville Water Company in 2006 and now provides water service as well. Although Sanitary Districts are authorized to provide water service, the GSD has indicated that it intends to reorganize as a CSD.

#### **System Standards**

GSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. When this system was operated as the private Garberville Water Company, it was subject to most of the same requirements. See Section 6.2 for additional information regarding public and private system standards.

#### **Fiscal Condition/Capital Replacement Program**

According to GSD records, they operate their water system on an annual budget of approximately \$225,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have \$125,000 in water reserves.

#### **Water Demand**

The GSD produced approximately 64 million gallons of drinking water in 2003 according to the latest DHS annual inspection report. Average daily use is estimated at approximately 0.175 MGD, and peak daily use is estimated at approximately 0.310 MGD. The District has approximately 394 existing connections and does not retail water to any other Districts.

#### **Water Supply, Treatment, Distribution and Storage**

GSD's water system consists of two sources of water supply, a treatment plant, four water tanks, three booster stations, and a distribution system that serves approximately 394 connections. The main source of water is from an infiltration gallery in the South Fork of the Eel River that was installed in 1940. A secondary groundwater source is also available and is known as the Tobin Well; however, substantial draw down has been known to occur and the well has even been known to stop producing water during dry periods. The District is limited by their appropriate water rights under Permits 003404 and 020789 with the State Water Resources Control Board, which allow for maximum diversions of 0.155 and 0.595 cfs, respectively, for a combined allowable extraction of 336 gpm from the infiltration gallery.

The infiltration gallery pumps water via a 50 horsepower, 320 gpm pump to the water treatment plant about 380 feet above the river. Therefore, the production capacity of the infiltration gallery is approximately 0.46 MGD. The water treatment plant consists of a pressure filter with a

maximum production capacity of 250 gpm (0.33 MGD if operated 22 hours per day), and is therefore more limiting than the source capacity. Filtered water is stored in a 175,000 gallon water storage tank located next to the treatment plant. The District also has three other storage tanks: one 50,000 gallon tank, one 30,000 gallon tank, and one 15,000 gallon tank. Total storage for the District is 270,000 gallons.

The majority of the distribution system was installed prior to 1940. Some of the lines are lead joint, some are copper, and most are either iron or asbestos cement. Only the line in Redwood Drive is 8 inch. Most of the downtown mains are 4-inches in diameter. The water mains in the Wallen and Johnson Subdivision were installed in 1978 and are mostly 6-inch lines. The system contains approximately 15 miles of pipe, of which approximately 70% of the system is in need of replacement, according to discussions with District staff.

### **Condition Assessment**

**Overview.** Water treatment and storage capacities will need to be increased to accommodate additional demand or to offer fire protection within the District. The storage capacity will service the system for just under 24 hours if the pumps, filters, or treatment equipment cease to operate for any reason. The storage capacity complies with the Waterworks Standards, but will not be capable of providing continuous water service during the summer months if replacement parts or repair labor are required for more than a 24 hour lead time. Having only 1 day (24 hours) of storage to meet the maximum daily demands is considered the minimum and generally it is recommended that a District have at least two or three times that amount in addition to fire suppression storage able to provide 1,000 gpm for two hours minimum.

The entire water distribution system is fed by a single transmission line from the main storage tank. This transmission line has a custom fabricated angle that is leaking. A patch was installed during the past few years but is only a temporary fix for the problem. There is no way to turn this line off or redirect the flow through it. Eventually, this joint will have to be replaced by a newly fabricated custom angle, or the lines will need to be realigned so that a more standard joint may be used.

The distribution system in downtown Garberville is not fed by any of the other three water tanks in the system. Any repairs to the main transmission line will result in a water outage for downtown Garberville. This could be remedied by installing fairly inexpensive flow devices at the Alderpoint Road Tank's fill line that would allow the downtown system to be fed by the upper portion of the system. In addition, most of the main lines are smaller than the 6 inch minimum that is generally needed for adequate fire flows.

Current peak day demands are approximately 67% of source capacity and 86% of treatment capacity.

**Current Deficiencies.** Many parts of the distribution system are approaching 70 years old. The District needs to replace copper pipes and leaded joints to meet current standards and to facilitate compliance with lead and copper rules for drinking water. According to District staff, the existing treatment plant is being operated beyond capacity, at loading rates of approximately 5 gpm/ft<sup>2</sup> whereas DHS recommends maximum loading rates of 3 gpm/ft<sup>2</sup>.

In addition, the current status of water supply with regards to fire suppression is inadequate. A minimum of 120,000 gallons of fire storage is recommended, and undersized water mains should also be replaced for adequate fire flows. As a first step, we recommend that a water master plan, including a computerized hydraulic model of the system be completed to more accurately develop and prioritize the necessary improvements.

**Underserved Areas.** The District serves all areas within its district boundaries and some homes and businesses that are outside its boundaries but within the District's proposed sphere of influence. Areas within the USA/WSA that are not served by the GSD, such as the Kimtu area located along Camp Kimtu Road southwest of Garberville, have expressed interest in annexing to the District and receiving service.

### **Proposed Improvements**

**System Upgrades.** The District has preliminary plans for a Water System Improvements Project and is actively seeking funding sources for the project including State Revolving Fund loans. The project will consist of two new infiltration gallery pumps, a new treatment plant, emergency backup power for the pumps and treatment plant, a new treated water booster pump station and water main, and additional storage capacity. The District also hopes to see about 70% of its water distribution system replaced. In addition to removing old lead and copper piping, this would also improve fire flows. The District hopes to begin construction around 2010.

**Future Expansion.** The District is looking at expanding service to the Garberville Airport and approximately twenty homes in the Mitchell Ranch/Kimtu Meadows area in the Garberville WSA, where the existing subdivision has proposed a connection to GSD's water system and is currently seeking Proposition 50 funding. Most of these areas are within the current GSD SOI; however, the SOI would need to be expanded to include the Kimtu area. LAFCo would need to approve an expansion of the GSD's SOI and district boundaries for this service extension to occur.

**Cost and Schedule of Improvements.** A Preliminary Engineering Report was completed in 2006 by Boyle Engineering for the District's Water System Improvement Project. The report estimated costs for infiltration gallery upgrades, a new package filtration plant, and minor distribution system upgrades at \$2.32 million. However, the District is still exploring funding options and has not committed to a completion date at this time.

### **6.4.5. Glendale USA & WSA**

The Glendale study area contains both a USA and WSA. Both study areas receive water service from Fieldbrook Glendale CSD (FGCSD), who also serves the Fieldbrook WSA, discussed further in Section 6.5.5.

The County estimates there were 165 and 99 housing units within the Glendale USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Glendale USA could have between 182 and 270 total housing units by 2025, while the Glendale WSA could have between 109 and 162 total housing units by 2025. However, according to Table 1-6, the high build-out estimate for total development potential within the Glendale USA and WSA, which takes into consideration physical and zoning constraints, is 1,354 and 100, respectively. Therefore, although the growth projections for the Glendale USA are well within the range of what the land can bear, the high growth rate projection for the Glendale WSA is in excess of what the land can bear.

The high build-out estimates for total development potential of 1,354 and 100 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 1,190 new housing units within the Glendale USA and WSA.

#### **6.4.5.1. Summary**

##### **Findings**

Glendale's water system, owned and operated by Fieldbrook Glendale CSD (FGCSD), is in good condition overall. The only major deficiency associated with the existing system and the existing development they serve is lower system pressure within some localized areas. The study area does not have any storage in its service area and normally relies on the HBMWD water reservoirs, although the Fieldbrook reservoir can be used to back feed to this area in an emergency. Additionally, the Glendale USA and WSA are expected to receive up to 1,190 new housing units before reaching build-out conditions. Glendale will need to expand its water system infrastructure to serve this additional growth.

##### **Existing Capacity**

The FGCSD's water system is not limited by either source or treatment capacity with respect to its availability of connections. HBMWD has sufficient water supply to meet the District's demands.

##### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for all study areas served by FGCSD, including the Glendale USA and WSA and the Fieldbrook WSA. Due to the interconnectedness of the water system, the study areas could not be assessed individually and were instead assessed collectively. The table addresses the District's infrastructure needs for existing development and for build-out conditions.

**Table 6-5. Water system infrastructure assessment for the FGCSD, including the Glendale USA/WSA and Fieldbrook WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	528
# of Available Connections <sup>1</sup>	---
Source Capacity (MGD)	Not limiting (HBMWD)
Storage Capacity (MG)	0.415
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.389
Usage Rate (gpd/connection)	737
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.094 MG <sup>2</sup></i>	\$188,000
<i>Install booster pump station</i>	\$450,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$638,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$1,208</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$6.46</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	159
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.117 MG <sup>3</sup></i>	\$234,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$234,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$1,472</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$872,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$380</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$2.03</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	1,765
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 1.300 MG <sup>3</sup></i>	\$2,600,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$2,600,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$1,474</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$3,238,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$1,412</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$7.55</b>

NOTES: <sup>1</sup>There is sufficient source supply from HBMWD to serve all development potential within the USA.

<sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.389 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.42 MG).

<sup>3</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 737 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$638,000 loan would amount to approximately \$41,000 per year. With 528 existing ratepayers, monthly bills would have to be increased by approximately \$6-7 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing

deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.5.2. Description of Urban Study Area**

A map showing the Glendale USA and Glendale WSA is attached as Figure 6-2. The Glendale USA and WSA are part of a larger planning area that encompasses both the Fieldbrook and Glendale sub-areas. The area's land use guidelines and development potential are covered in the Fieldbrook Glendale Community Plan, for which a draft plan was prepared in May 2006. The draft Fieldbrook Glendale Community Plan is likely to be included in this General Plan Update. Zoning classification within the Glendale USA and WSA is currently Unclassified (U) with a small area of Residential Single-Family (RS).

The Glendale USA has 456 total acres, of which 284 acres are underdeveloped and/or vacant parcels. Of this total acreage, 218 acres within the USA are developable. The Glendale WSA has 400 total acres, of which 59 acres are underdeveloped and/or vacant parcels. Of this total acreage, 47 acres within the WSA are developable. With respect to development potential, the majority of the Glendale USA consists mainly of underdeveloped parcels with some vacant parcels. The Glendale WSA consists of two separate areas and contains both vacant and underdeveloped parcels.

#### **6.4.5.3. Water System Service Area Description**

The Glendale USA is served by a community water system owned and operated by Fieldbrook Glendale Community Services District (FGCSD), although portions of the study area rely on private wells, springs or surface water intakes generally of poor quality. Portions of the Glendale WSAs receive water service from FGCSD, while other portions (up Liscomb Hill Road and Hilltop Lane) receive water from the City of Blue Lake. The FGCSD was declared formed in 1973 under the Community Services District Act pursuant to Government Code Section 61000-61936. The governing board is elected and consists of a five (5) member Board of Directors to supervise the business of the District.

#### **System Standards**

FGCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

According to FGCSD records, they operate their water system on an annual budget of approximately \$250,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District does not currently have a Capital Improvement Plan, and they currently have approximately \$0.5 million in water and wastewater reserves.

## Water Demand

According to 2005/2006 HBMWD records, FGCS D's average daily use was 0.166 MGD and peak daily use was 0.389 MGD. The FGCS D retailed approximately 64 million gallons of drinking water in fiscal year 2005/2006. FGCS D services approximately 528 existing connections according to the 2005 DHS annual inspection report.

## Water Supply, Treatment, Distribution and Storage

FGCS D purchases treated water from Humboldt Bay Municipal Water District (HBMWD) for delivery to its customers. FGCS D's water system begins at a water meter just north of the intersection of Fieldbrook Road and Glendale Drive. The system contains approximately 13 miles of water mains, two booster pump stations, and one 400,000 and one 20,000 gallon water tank. Water quality is representative of HBMWD's excellent water source and meets or exceeds State standards.

## Condition Assessment

**Overview.** Water service within the Glendale USA is generally very good with the exception of some low pressure areas. Peak daily use of HBMWD water for the District (0.389 MGD in 2005/2006) is currently less than their peak rate allocation of 0.43 MGD set in contract with HBMWD on July 1, 2006.

**Current Deficiencies.** Some localized low pressure areas exist within the service area; therefore, additional pressure is needed especially before significant additional growth occurs. Additional storage is also needed in either the Glendale or Fieldbrook sub-areas, and emergency backup power is needed at the Lyman Road Pump Station.

**Underserved Areas.** The FGCS D serves all areas within its service boundaries with the exception of several homes within the Fieldbrook WSA and Glendale WSA who rely on private water sources due to the distance from their homes to existing water mains. Whether these homes connect in the future is dependent on the feasibility of connecting these homes on an individual home basis.

## Proposed Improvements

**System Upgrades.** The District's main problem involves low water pressure within certain regions of its service area. The District's long range plans for improvements include:

- Construction of a new booster pump station at Korblex to improve water pressure within the service area. This will also improve water pressure for HBMWD's customers along Warren Creek and West End Roads and will allow the existing City of Blue Lake water booster pump station to deliver more water.
- Installation of a standby emergency generator at the Lyman Road Pump Station
- Construction of an additional reservoir to provide additional storage capacity.

**Future Expansion.** There is significant potential for growth in the Glendale sub-area, on the order of 500 – 700 new dwelling units. Although sufficient water is available to service these homes, additional wastewater treatment and disposal infrastructure is needed. FGCS D's existing wastewater contract with the City of Arcata would need to be amended to allow for these additional units, or an alternative solution would need to be developed.

**Cost and Schedule of Improvements.** The FGCS D has not developed a Capital Improvement Plan that covers costs and schedules for improvements to its water system.

#### **6.4.6. Hydesville USA & WSA**

The Hydesville study area contains both a USA and WSA. The County estimates there were 201 and 366 housing units within the Hydesville USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Hydesville USA could have between 222 and 329 total housing units by 2025, while the Hydesville WSA could have between 404 and 600 total housing units by 2025. According to Table 1-6, the high build-out estimates for total development potential within the USA and WSA, which takes into consideration physical and zoning constraints, are 755 and 612, respectively. Therefore, the growth projections for each study area are within the range of what the land can bear.

The high build-out estimates for total development potential of 755 and 612 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 800 new housing units within the Hydesville USA and WSA.

##### **6.4.6.1. Summary**

###### **Findings**

Hydesville's water system is in good condition. There are no major infrastructure deficiencies associated with the existing system. Some older asbestos cement pipe in the distribution system piping may require replacement over the next twenty years. The District recently acquired a Grade 2 water distribution operator in 2005, which brought the system into compliance with DHS requirements. Additionally, the Hydesville USA and WSA are expected to receive an additional 800 units before reaching build-out conditions. Hydesville will need to expand its water system infrastructure to serve this additional growth.

###### **Existing Capacity**

Hydesville's water system is currently limited by the source capacity of its wells with respect to availability of connections. Source capacity is limited by the existing pumps and is approximately 0.518 MGD if the pumps are operated 24 hours per day. Given existing maximum day demands are estimated at 0.3 MGD, the system is operating at approximately 58% of source capacity. Therefore, there are approximately 326 available connections under the existing infrastructure.

###### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Hydesville USA/WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA/WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-6. Water system infrastructure assessment for the Hydesville USA and WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	450
# of Available Connections <sup>1</sup>	326
Source Capacity (MGD)	0.518
Storage Capacity (MG)	0.6
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.28
Usage Rate (gpd/connection)	622
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Upgrade distribution system – 2.5 miles <sup>2</sup></i>	\$1,320,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$1,320,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$2,933</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$15.68</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	166
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed <sup>3</sup></i>	\$0
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$0</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$0</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$1,320,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$2,143</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$11.45</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	800
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.298 MG <sup>4</sup></i>	\$596,000
<i>Increase source capacity – drill 2 new wells</i>	\$100,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$696,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$870</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$2,016,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$1,613</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$8.62</b>

NOTES: <sup>1</sup> The number of available connections in the Hydesville study areas was estimated based on the District currently being at 58% of its source capacity.

<sup>2</sup> The estimated length of the pipeline less than 6 inches in diameter, according to County GIS database. Distribution piping smaller than 6 inches in diameter is recommended to be replaced for adequate fire flows. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

<sup>3</sup> Existing storage is sufficient to meet both existing and future domestic and fire storage requirements.

<sup>4</sup> Additional storage requirements are based on 1 day of estimated future maximum day use (622 gpd/connection x 1,250 connections = 0.778 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.6 MG).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.32 million loan would amount to approximately \$85,000 per year. With 450 existing ratepayers, monthly bills would have to be increased by \$16 per month to fund this loan. In reality, we would expect the District to apply for

and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale, as evidenced by the lower monthly financing costs shown under the low and high build-out scenarios..

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.6.2. Description of Urban Study Area**

A map showing the Hydesville USA and WSA is attached as Figure 6-3. The Hydesville USA contains two distinct areas – the Hydesville area and the Carlotta area. It may be appropriate to evaluate the potential for both of these areas to be serviced by the same utility District. The Hydesville WSA surrounds the Hydesville area and also contains the area between the Hydesville area and the Carlotta area of the Hydesville USA.

The Hydesville USA has 579 total acres, of which 243 acres are underdeveloped and/or vacant parcels. Of this total acreage, 178 acres within the USA are developable. The Hydesville WSA has 2,398 total acres, of which 1,044 acres are underdeveloped and/or vacant parcels. Of this total acreage, 588 acres within the WSA are developable. With respect to development potential, the majority of the Hydesville USA consists of underdeveloped parcels with some vacant parcels. Only a few developable lots exist within the Carlotta sub-area. The Hydesville WSA consists of both vacant and underdeveloped parcels. The area's land use guidelines and development potential are covered in the Hydesville-Carlotta Community Plan.

#### **6.4.6.3. Water System Service Area Description**

Water service in the Hydesville area is provided by the Hydesville County Water District (HCWD). The Carlotta area has no public water system and depends solely on individual private water sources. The HCWD was originally organized March 26, 1963 under Division 12 of the Water Code of the State of California and by Resolution 1861 of the Humboldt County Board of Supervisors. The five member governing board of the District is elected by the residents of the District to supervise the business of the District. The term of office of the board members is four years. The District was formed for the purpose of providing water services.

#### **System Standards**

HCWD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

The District's water supply and distribution system was constructed with funds obtained through a Davis-Grunsky loan from the Department of Water Resources in fiscal year 1964-65. This loan was in the amount of \$182,500 with an interest rate of 3.1% per annum on the declining principal balance. Under the terms of the agreement with the state, the District is to repay this loan in 47 equal annual payments that began in 1970.

The County Water District Principal Act empowers county water Districts to levy a property tax in lieu of, or in addition to customer service charges. However, the HCWD has not levied a property tax assessment since the 1966-67 fiscal year. The District has relied, instead, on connection fees and water sales to finance their activities. With this financing arrangement, the District has not experienced the revenue reductions imposed by the passage of Proposition 13 in June 1978. The District may not be able to re-establish a property tax levy in the future, if such action becomes necessary or desirable to augment their other revenue sources.

According to HCWD records, they operate their water system on an annual budget of approximately \$161,000. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have \$9,000 in reserves.

### **Water Demand**

HCWD production data is not available from the DHS as of the latest 2005 inspection report, as HCWD had not submitted an Annual Report to the Drinking Water Program (ARDWP). Since 2005, the District has had a change of operators and has begun to submit annual reports as required by the DHS. According to the District, HCWD retails approximately 38 million gallons of drinking water per year. Average daily use for the entire District is therefore estimated at approximately 0.104 MGD, and peak daily use was reported as 0.28 MGD. The latest DHS annual inspection report also reported a maximum day use of 0.28 MGD in 1995. The Hydesville USA has approximately 450 existing connections, of which all are residential connections.

### **Water Supply, Treatment, Distribution and Storage**

The District's water supply is obtained from two (2), twelve inch (12") wells located on District owned land near Yager Creek. These wells are equipped with pumps which have a rated pumping capacity of 360 gpm, or 0.52 MGD. The water is chlorinated at the well site and then pumped to the District's two storage tanks. These storage tanks have a capacity of 200,000 and 400,000 gallons, for a total storage capacity of 0.6 MG. The stored water is distributed by gravity, throughout the District's distribution system. The distribution system consists of approximately 14 miles of 2-inch to 8-inch mains made of steel, AC, and PVC pipe. The District has installed fire hydrants throughout the service area.

### **Condition Assessment**

**Overview.** Water service within the Hydesville USA is generally good. The District is at approximately 60% of its source capacity during peak usage periods.

**Current Deficiencies.** In some areas, located in the northern part of the District (Quail Hill subdivision area) the 4-inch mainline is inadequate in size to maintain the fire flow requirements and topography is a constraint on service area expansion utilizing the existing gravity fed system. Outside the District, but within the sphere of influence, Quiggle subdivision adjacent to the west side of the Quail Hill subdivision has a topographic constraint. This subdivision is served by private wells, and the subdivision would need to establish a second pressure zone to provide adequate water flow and pressure. The Carlotta area is also not served by a community water system and expansion of the HCWD is the logical solution to serving this area.

**Underserved Areas.** The HCWD serves all areas within its service boundaries.

## Proposed Improvements

**System Upgrades.** The District recently completed a Water System Improvement Project which included the following upgrades:

- Seismic upgrade and painting of 200,000 gallon water storage tank.
- Addition of second line from well site to North Fisher Road replacing existing line through slippage area.
- Creating loops in distribution system from North Fisher Road to Creekside Place and from Chuckhole Road to Rohnerville Road.

The District is now planning the following improvements as funds become available:

- Increase size of distribution lines in the Quail Hill subdivision.
- Additional well and additional 500,000 gallons storage.

**Future Expansion.** The District has no plans for future expansion. However, the County is interested in the prospect of HCWD becoming a community services District and expanding services to include sewer service in addition to water, and expand services to Carlotta as well.

**Cost and Schedule of Improvements.** The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

### 6.4.7. Loleta USA

The County estimates there were 278 housing units within the Loleta USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Loleta USA could have between 307 and 456 total housing units by 2025. However, according to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is only 394. Therefore, the high growth rate projection is in excess of what the land can bear.

The high build-out estimate for total development potential of 394 housing units in the USA was used for infrastructure assessment and recommendations. This represents 116 new housing units within the Loleta USA.

#### 6.4.7.1. Summary

##### Findings

Loleta's water system is in poor to fair condition. Major deficiencies associated with the existing system are poor water quality and quantity from the wells, undersized distribution mains, and inadequate storage capacity. The existing greensand treatment facility is also undersized and not providing adequate removal of iron and manganese. Additionally, the Loleta USA could receive up to an additional 116 new housing units before reaching build-out conditions. The Loleta CSD will need to upgrade and expand its water system infrastructure to serve this additional growth.

##### Existing Capacity

Loleta's water system is currently limited by the source capacity of its wells with respect to availability of connections. Source capacity is limited by the existing pumps and is approximately 0.276 MGD if the pumps are operated 24 hours per day. Given existing maximum day demands are estimated at 0.21 MGD, the system is operating at approximately 76% of

source capacity. Therefore, there are approximately 75 available connections under the existing infrastructure. Treatment is not considered limiting as it is designed for iron and manganese removal, two constituents that do not pose health related threats but do cause taste and aesthetic problems.

### Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Loleta USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-7. Water system infrastructure assessment for the Loleta USA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	239
# of Available Connections <sup>1</sup>	75
Source Capacity (MGD)	0.276
Storage Capacity (MG)	0.225
Treatment Capacity (MGD)	0.158
Peak Day Use (MGD)	0.21
Usage Rate (gpd/connection)	879
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.105 MG <sup>2</sup></i>	\$210,000
<i>Upgrade distribution system – 0.6 miles <sup>3</sup></i>	\$316,800
<i>Expand greensand filter capacity – 0.052 MGD <sup>4</sup></i>	\$260,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$786,800</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$3,292</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$17.60</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	87
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.076 MG <sup>5</sup></i>	\$152,000
<i>Additional source capacity – drill 2 new wells</i>	\$100,000
<i>Expand greensand filter capacity – 0.076 MGD <sup>4</sup></i>	\$380,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$632,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$7,264</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$1,418,800</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$4,352</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$23.26</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	116
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.102 MG <sup>5</sup></i>	\$204,000
<i>Additional source capacity – drill 2 new wells</i>	\$100,000
<i>Expand greensand filter capacity – 0.102 MGD <sup>4</sup></i>	\$510,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$814,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$7,017</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$1,600,800</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$4,509</b>

<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$24.10</b>
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- NOTES: <sup>1</sup> The number of available connections within the Loleta area was estimated based on the supply capacity of the wells. Current peak day demands are 76% of supply capacity.
- <sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.21 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.225 MG).
- <sup>3</sup> According to the DHS annual inspection report, approximately 13% of the 4.5 miles of distribution system is galvanized steel pipe in fair condition. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).
- <sup>4</sup> Existing treatment capacity is estimated at 0.158 MGD.
- <sup>5</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 879 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$786,800 loan would amount to approximately \$50,000 per year. With 239 existing ratepayers, monthly bills would have to be increased by \$18 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.7.2. Description of Urban Study Area**

A map showing the Loleta USA is attached as Figure 6-6. The Loleta USA is located just south of Humboldt Bay and north of the Eel River floodplain along U.S. Highway 101. The Loleta USA has 119 total acres, of which 34 acres are underdeveloped and/or vacant parcels. Of this total acreage, 31 acres within the USA are developable. With respect to development potential, the Loleta USA consists of both underdeveloped parcels and some larger vacant parcels. The area's land use guidelines and development potential are addressed in the Eel River Area Plan (Local Coastal Program) and the Humboldt County Framework General Plan.

#### **6.4.7.3. Water System Service Area Description**

The Loleta USA is provided water service through the Loleta Community Services District (LCSD). The LCSD was originally organized on November 13, 1990 under Government Statute 1923, Statutes 1, Chapter 171. The governing board of the District is the Board of Directors. The registered voters of the District elect the Board of Directors. The District was formed for the purpose of providing water and sewer services.

#### **System Standards**

LCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

## **Fiscal Condition/Capital Replacement Program**

According to LCSD records, the District operates its water system on an annual budget of approximately \$132,000. The majority of this income is from service charges and water sales. Replacement or depreciation funds are not accumulated through revenues. The District last developed a Capital Improvement Plan in 2007, and they do not currently have water fund reserves. In fact, the water fund is in debt to the wastewater fund for approximately \$140,000.

## **Water Demand**

LCSD retailed over 38 million gallons of drinking water in 2005 according to the 2007 DHS annual inspection report. Average daily use is therefore estimated at 0.105 MGD, and peak daily use was reported as unknown but is estimated as twice average daily use, or approximately 0.210 MGD. The Loleta USA has approximately 239 existing connections, of which approximately 226 are residential connections and the remaining 13 connections are non-residential connections serving 11 businesses and 2 industrial connections including the Loleta Cheese Factory and the Humboldt Creamery. Approximately 94% of households within the USA are serviced with water. Roughly 25% of water demands are associated with the commercial and industrial users (Drumm, 2007); therefore residential maximum day usage is estimated at 0.158 MGD (697 gpd/connection).

## **Water Supply, Treatment, Distribution and Storage**

The District has a total of four wells available for use; however, only one is in daily use. Well production ranges from 25 to 80 gpm, for a total production capacity of 276,000 gpd. All wells exceed the secondary DHS limits for iron, manganese, or both. Therefore, the District's main limitation is its capacity to remove iron and manganese from the water through its green sand filter. The green sand filter removes iron and manganese by injecting chlorine and potassium permanganate. Treated water is provided to the service area through approximately 3 miles of pipe from a 225,000 gallon storage tank located just off the freeway. The treatment system runs an average of twelve to thirteen hours a day.

## **Condition Assessment**

**Overview.** Water service within the Loleta USA is generally fair, although the District does suffer from poor quality groundwater with respect to secondary DHS limits. Current peak water use is at approximately 76% of available production capacity.

**Current Deficiencies.** The present storage capacity is inadequate for combined emergency and fire storage suggested requirements. The storage tank is also an older redwood tank and will likely need repairs or replacement with this planning period. Some water mains are also undersized with respect to ability to provide fire flows. Water quality is also an issue, and wells in this area are known to have problems with either the quantity or quality (or both) of water produced. The existing greensand treatment system is also undersized (Oscar Larson & Associates, 2006b).

**Underserved Areas.** The LCSD serves all areas within its service boundaries.

## **Proposed Improvements**

**System Upgrades.** The District's main well is leased. Therefore, the District plans to purchase or acquire this property through eminent domain. A second well will also be drilled on this property. Additional land will be required to install a treatment facility for these wells. A new treatment plant is planned for completion in 2009.

Present storage is inadequate for combined emergency and fire storage. Therefore, additional storage is planned to be built and the existing storage repaired. Present plans are for construction of a second tank with 155,000 gallons of storage and repair of the existing 225,000 gallon tank. The new storage tank is planned for 2010. Additional water mains are being considered to provide fire flows in all sections of town. Mains may be extended on South Main or Montgomery to service new construction in that area.

**Future Expansion.** A subdivision has been approved which will increase the water infrastructure to include up to 39 new connections. There are no plans to expand operations beyond existing subdivision and infill plans.

**Cost and Schedule of Improvements.** The District's latest Capital Improvements Plan was developed in 2007 and identified two major projects – an upgrade to the well sources estimated at \$760,000 and construction of a second storage tank, estimated at \$540,000.

### **6.4.8. Manila USA**

The County estimates there were 389 housing units within the Manila USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Manila USA could have between 430 and 637 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is 622. Therefore, the high growth rate projection is in excess of what the land can bear.

The high build-out estimate for total development potential of 622 housing units in the USA was used for infrastructure assessment and recommendations. This represents 233 new housing units within the Manila USA.

#### **6.4.8.1. Summary**

##### **Findings**

Manila's water system is in good condition. The only major deficiencies associated with the existing system are some undersized water mains and inadequate storage capacity. The existing storage tank is of redwood construction and is over 40 years old. It is anticipated that this tank will need either rehabilitation or replacement within the planning period. The District is currently exploring grant funding to increase water storage capacity. Additionally, the Manila USA could receive up to an additional 233 new housing units before reaching build-out conditions. The Manila CSD will need to expand its water system infrastructure to serve this additional growth.

##### **Existing Capacity**

Manila's water system is not limited by either source or treatment capacity with respect to its availability of connections. HBMWD has sufficient water supply to meet District demands.

##### **Summary Of Required Improvements**

The following table summarizes the infrastructure assessment for the Manila USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-8. Water system infrastructure assessment for the Manila USA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	342
# of Available Connections <sup>1</sup>	---
Source Capacity (MGD)	Not limiting (HBMWD)
Storage Capacity (MG)	0.1
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.157
Usage Rate (gpd/connection)	459
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.177 MG <sup>2</sup></i>	\$354,000
<i>Upgrade distribution system – 2,300 LF <sup>3</sup></i>	\$230,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$584,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$1,708</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$9.13</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	142
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.065 MG <sup>4</sup></i>	\$130,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$130,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$915</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$714,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$1,475</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$7.89</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	233
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.107 MG <sup>4</sup></i>	\$214,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$214,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$918</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$798,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$1,388</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$7.42</b>

NOTES: <sup>1</sup> There is sufficient source supply from HBMWD to serve all development potential within the USA.

<sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.157 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.1 MG).

<sup>3</sup> According to the DHS annual inspection report, some old 2-inch mains remain in the system. These should be replaced to provide more reliable fire flows. District staff report approximately 2,300 LF of 2" pipe. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

<sup>4</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 459 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$584,000 loan would amount to approximately \$37,500 per year. With 342 existing ratepayers, monthly bills would have to be increased by approximately \$9 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In

addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.8.2. Description of Urban Study Area**

A map showing the Manila USA is attached as Figure 6-7. The Manila Urban Study Area is located along the north spit of Humboldt Bay on the Samoa Peninsula, between Humboldt Bay and the beach and dunes of the Pacific Ocean. The Manila USA has 1,455 total acres, of which 172 acres are underdeveloped and/or vacant parcels. Of this total acreage, 131 acres within the USA are developable. With respect to development potential, the Manila USA consists of both underdeveloped parcels and some larger vacant parcels. The area's land use guidelines and development potential are addressed in the Humboldt Bay Area Plan (Local Coastal Program) and the Humboldt County Framework General Plan. Much of the District is in the Tsunami inundation zone.

#### **6.4.8.3. Water System**

##### **Service Area Description**

The Manila USA is provided water service through the Manila Community Services District (Manila CSD). The Manila CSD was formed on July 20, 1965 by the Humboldt County Board of Supervisors as an independent multi-purpose District organized pursuant to Resolution No. 2130 adopted under the Community Services District Law, pursuant to Title 6, Division 2, of the California Government Code. The five-member Board of Directors is locally elected by the residents of the District. The District employs a General Manager who is responsible for administering and implementing policies set by the Board. The Manila CSD provides water, wastewater, and recreation services.

##### **System Standards**

Manila CSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

##### **Fiscal Condition/Capital Replacement Program**

According to Manila CSD records, the District operates its water system on an annual budget of approximately \$122,000. The majority of this income is from service charges and water sales. Replacement or depreciation funds are not accumulated through revenues, although the District is beginning a rate increase to accumulate these funds. The District developed a preliminary Capital Improvement Plan in August 2007, and they currently do not have built up reserves.

##### **Water Demand**

According to 2005/2006 HBMWD records, Manila CSD's average daily use was 0.119 MGD and peak daily use was 0.157 MGD. The District delivered approximately 45 million gallons of water in fiscal year 2005/2006. The District has approximately 342 active connections, of which 336 are

residential connections (308 single family and 28 multi family). Non-residential connections include Sierra Pacific Industries, Redwood Coast Trucking, Manila Community Center and Park, an RV Park, and formerly Manila Market.

### **Water Supply, Treatment, Distribution and Storage**

The District receives its water supply through contract with HBMWD. Water is delivered from HBMWD's pipeline through a 10-inch DIP or AC pipe leading to the District's distribution system, which consists of approximately 6 miles of distribution mains ranging in size from 2 inches to 8 inches. Approximately 95% of the distribution system is AC pipe, while the remaining 5% is PVC pipe. The District has one main pressure zone served by a 0.1 MG redwood storage tank. The system has a booster pump station to supply system pressure when high demands cause a drop in pressure or to supply the system during outages or for fire flow.

### **Condition Assessment**

**Overview.** Water service within the Manila USA is generally good. Peak daily use of HBMWD water for the City (0.157 MGD in 2005/2006) is currently less than their peak rate allocation of 0.21 MGD set in contract with HBMWD on July 1, 2006.

**Current Deficiencies.** The system has several old 2-inch mains, which are not in accordance with Waterworks Standards for distribution systems. Storage capacity is also not in compliance with Waterworks Standards and does not meet minimum fire suppression requirements. However, MCSD reports that all hydrants are on six inch water mains or larger. MCSD further reports that homes built after 2001 meet the requirement for a hydrant to be located within 250 feet of the structure, and that homes built earlier met the then current code. The storage tank is constructed of redwood and will likely need to be rehabilitated or replaced within the planning period.

**Underserved Areas.** The MCSD serves all areas within its service boundaries.

### **Proposed Improvements**

**System Upgrades.** The District has no major plans for system upgrades at this time. They are planning on minor upgrades, such as replacing valves, installing new fire hydrants, and replacing the storage tank roof in the near future. The District is also applying for grants to increase water storage capacity.

**Future Expansion.** The District may expand services south of its current service boundary depending on the status of proposed developments and their willingness to fund such improvements. However, the fact that portions of the District are within the Tsunami inundation zone may impact the extent of future development.

**Cost and Schedule of Improvements.** The District developed a preliminary Capital Improvement Plan in August 2007 that covers costs and schedules for improvements to its water system.

### **6.4.9. McKinleyville USA & WSA**

The McKinleyville study area contains both a USA and WSA. The County estimates there were 5,940 and 431 housing units within the McKinleyville USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the McKinleyville USA could have between 6,563 and 9,733 total housing units by 2025, while the McKinleyville WSA could have between 476 and 706 total housing units by 2025. According to Table 1-6, the high build-out estimates for total development potential within the USA and WSA, which takes into

consideration physical and zoning constraints, are 10,052 and 568, respectively. Therefore, the growth projections for the WSA are in excess of what the land can bear.

The high build-out estimates for total development potential of 10,052 and 568 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 4,249 new housing units within the McKinleyville USA and WSA.

#### **6.4.9.1. Summary**

##### **Findings**

McKinleyville's water system is in good condition. There are no major infrastructure deficiencies associated with the existing system, aside from the need for additional storage. Efforts are underway to upgrade the pump station on North Bank Road to improve system pressures when HBMWD's Korblex tank water levels are low. The District has also recently purchased a property for siting of a 6-MG water storage tank and will be beginning design in the near future. Additionally, the McKinleyville USA and WSA are expected to receive up to 4,249 new housing units before reaching build-out conditions. McKinleyville will need to expand its water system infrastructure to serve this additional growth. However, it's been assumed that any costs for new main-line extensions would be borne by developer(s).

##### **Existing Capacity**

McKinleyville's water system is not limited by either source or treatment capacity with respect to its availability of connections. HBMWD has sufficient water supply to meet District demands.

##### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the McKinleyville USA/WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA/WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-9. Water system infrastructure assessment for the McKinleyville USA and WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	5,085
# of Available Connections <sup>1</sup>	---
Source Capacity (MGD)	Not limiting (HBMWD)
Storage Capacity (MG)	5.25
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	3.792
Usage Rate (gpd/connection)	746
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Upgrade North Bank Rd. booster station</i>	\$250,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$250,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$49</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$0.26</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	2,347
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.412 MG <sup>2</sup></i>	\$824,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$824,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$351</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$1,074,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$145</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$0.77</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	4,249
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 1.831 MG <sup>2</sup></i>	\$3,662,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$3,662,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$861</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$3,912,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$419</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$2.24</b>

NOTES: <sup>1</sup> There is sufficient source supply from HBMWD to serve all development potential within the USA.

<sup>2</sup> Additional storage requirements are based on 1 days of estimated maximum day use for new connections (# of total connections x 746 gpd/connection).plus minimum fire storage of 120,000 gallons minus existing storage (5.25 MG).

The above estimated costs are based upon assumptions and the actual costs will be different. McKinleyville CSD has approximately \$1.57 million in reserves that could fund a portion of their future infrastructure needs. Under high build out conditions, approximately \$2.092 million in additional funding will be required. This funding would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$2.092 million loan would amount to approximately \$134,000 per year. With 9,334 potential ratepayers under high build-out, monthly bills would have to be increased by slightly over one dollar.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as

these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.9.2. Description of Urban Study Area**

A map showing the McKinleyville USA and WSA is attached as Figure 6-8. The study areas are located north of Humboldt Bay in mid-Humboldt County, California along the coast. The USA stretches from North Bank Road along the Mad River on the south to Patrick's Creek on the north. The WSA is located mainly northeast of the USA and contains areas such as Dows Prairie. The eastern boundary of the McKinleyville WSA borders the Fieldbrook WSA.

The McKinleyville USA has 5,521 total acres, of which 2,038 acres are underdeveloped and/or vacant parcels. Of this total acreage, 1,683 acres within the USA are developable. The McKinleyville WSA has 2,740 total acres, of which 836 acres are underdeveloped and/or vacant parcels. Of this total acreage, 670 acres within the WSA are developable. With respect to development potential, the McKinleyville USA consists of both underdeveloped parcels and vacant parcels. The area's land use guidelines and development potential are covered in the McKinleyville Community Plan and the McKinleyville Area Plan (Local Coastal Program) for the portion of the USA within the coastal zone.

#### **6.4.9.3. Water System Service Area Description**

The McKinleyville USA receives water service from McKinleyville Community Services District (MCSD). The Dows Prairie portion of the McKinleyville WSA and the Patrick's Creek CSD, whose residents are retail customers of MCSD, receives water service from the District, while some of the WSA relies on private water supplies. MCSD was declared formed on April 21, 1970 after a successful special election was held within the area proposed for District formation.

The District was formed as an independent multi-purpose District organized pursuant to Section 61000 et seq. of the California Government Code. Although the District now provides water, wastewater, recreation, and street light services, it was originally formed to provide a community water supply system only. The McKinleyville CSD's area of approximately 19.5 square miles makes it the largest District of its type in Humboldt County. When formed, the District had a land area of 19 square miles or 12,160 acres. The *Azalea Park Annexation* in 1973 (the District's only annexation since formation) added approximately one-half square mile or 320 acres. The District's current boundaries encompass the area from the Pacific Ocean on the west to the ridgeline bordering the Fieldbrook area on the east. The District extends north from the Mad River approximately 5.5 miles. The McKinleyville CSD is governed by a locally elected five-member Board of Directors.

The Patrick's Creek CSD is located in the northern end of the McKinleyville WSA. The Patrick's Creek CSD does not provide domestic water service and the residents of the District are retail water customers of MCSD.

#### **System Standards**

MCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

## **Fiscal Condition/Capital Replacement Program**

According to MCSD records, they operate their water system on an annual budget of approximately \$1.553 million. The majority of this income is from service charges, but funding also comes from connection charges and interest on reserves. Replacement or depreciation funds are accumulated through revenues in general reserves. The District's currently maintains a five and ten year Capital Improvement Plan and they currently have approximately \$1.57 million in reserves.

## **Water Demand**

According to 2005/2006 HBMWD records, MCSD's average daily use was 1.696 MGD and peak daily use was 3.792 MGD. The District delivered over 636 million gallons of water in fiscal year 2005/2006. The District has approximately 5,085 existing connections, of which about 4,785 are residential connections, and retails water to the Patrick's Creek CSD.

## **Water Supply, Treatment, Distribution and Storage**

The District purchases potable water from HBMWD. The District currently has 5.25 million gallons of storage capacity. The existing distribution system has more than sufficient capacity for existing demands and is sized to serve approximately 10,000 homes.

Treated water from HBMWD's Korblex storage tanks is piped under the Mad River to MCSD's Grant A. Ramey Pump Station at the intersection of Azalea and North Bank Roads. The water is then boosted up to four storage tanks located at Cochran and Norton Roads and in-turn to a third higher elevation tank on McCluski Hill. The Cochran and Norton sites each contain a 1.0 and 1.5 MG steel reservoir. The McCluski Hill site contains a 0.1 and 0.15 MG redwood reservoir. This system provides a gravity-flow distribution of water to end users and fire hydrants throughout the water service area. A fourth undeveloped tank site on Murray Road has been purchased by the MCSD to serve future community water needs. The District plans to build a six million gallon storage tank at this site. The delivery system, from storage tanks to individual users, consists of about 70 miles of water mains.

## **Condition Assessment**

**Overview.** MCSD's water system is in good condition overall. Peak daily use of HBMWD water for the District (3.792 MGD in 2005/2006) currently exceeds their peak rate allocation of 2.80 MGD set in contract with HBMWD on July 1, 2006.

**Current Deficiencies.** The pump station on North Bank Road is currently limited by the water level at the HBMWD's Essex Hill storage tank at Korblex. Efforts to upgrade the pump station are underway.

**Underserved Areas.** All areas are served within the McKinleyville USA and WSA.

## **Proposed Improvements**

**System Upgrades.** The District is investigating an additional 6 million gallons of storage capacity to serve future development in the northern reaches of the District and additional water supply sources to provide additional redundancy in case of emergency. Efforts to upgrade the pump station are also under way. The District is also investigating a connection with the City of Arcata's water system for additional redundancy and for emergency backup purposes.

**Future Expansion.** Most expected growth will be centered around the area from Central Avenue to McKinleyville Avenue in vacant tracts owned by the Miller and Pierson Families. Infill will

continue to occur by subdividing parcel with the USA to obtain higher density. Pockets of undeveloped large parcels occur in the southwest portion of town west of Highway 101 in some large tracts south of Murray Road and east of Central Avenue. The area from Dows Prairie Road to Central Avenue east of the airport has been considered for inclusion into the USA as infill becomes limited. MCSD foresees the possibility of extending water service to Dows Prairie in the northern reaches of its service area. This area, including the Dows Prairie area that is currently being served could potentially become a new pressure zone and outfitted with new water storage tanks.

**Cost and Schedule of Improvements.** MCSD has developed a Capital Improvement Plan that covers costs and schedules for improvements to its water system. These include periodic painting of the four steel reservoirs, pump replacements and upgrades of the Ramey Pump Station, planned construction of a new 6.0 million gallon tank on the Murray Road site and development of an emergency inter-tie to the south side of the Mad River. An emergency water supply may include the development of a well to provide supply in the event of an emergency or seismic event damaging the water main transmission line underneath the Mad River in the Hunt Road area.

#### **6.4.10. Miranda USA**

The County estimates there were 203 housing units within the Miranda USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Miranda USA could have between 224 and 333 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is 277. Therefore, the high growth rate projection is in excess of what the land can bear.

The high build-out estimate for total development potential of 277 housing units in the USA was used for infrastructure assessment and recommendations. This represents 74 new housing units within the Miranda USA.

##### **6.4.10.1. Summary**

###### **Findings**

Miranda's water system is in fair to good condition. The major deficiencies associated with the existing system are some undersized water mains and inadequate storage capacity. Additionally, the Miranda USA could receive up to an additional 74 units before reaching build-out conditions. The Miranda CSD will need to expand its water system infrastructure to serve this additional growth.

###### **Existing Capacity**

Miranda's water system is currently limited by the source capacity of its wells with respect to availability of connections. Source capacity is limited by the existing pumps and is estimated at 0.338 MGD if the pumps are operated 24 hours per day. Given existing maximum day demands are estimated at 0.22 MGD, the system is operating at approximately 65% of source capacity. Therefore, there are approximately 77 available connections under the existing infrastructure.

###### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Miranda USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-10. Water system infrastructure assessment for the Miranda USA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	143
# of Available Connections <sup>1</sup>	77
Source Capacity (MGD)	0.338
Storage Capacity (MG)	0.2
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.220
Usage Rate (gpd/connection)	1,538
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.140 MG <sup>2</sup></i>	\$280,000
<i>Upgrade distribution system – 2 miles <sup>3</sup></i>	\$1,056,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$1,336,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$9,343</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$49.94</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	48
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.074 MG <sup>4</sup></i>	\$148,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$148,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$3,083</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$1,484,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$7,770</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$41.53</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	74
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.114 MG <sup>4</sup></i>	\$228,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$228,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$3,081</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$1,564,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$7,207</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$38.53</b>

NOTES: <sup>1</sup> The number of available connections within Miranda was estimated based on the supply capacity of the wells. Current peak day demands are 65% of supply capacity.

<sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.220 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.2 MG).

<sup>3</sup> According to the DHS annual inspection report, approximately 70% of the distribution system is AC pipe in fair condition. High usage rates (1,538 gpd/connection) may also be indicative of extensive leaks in pipes warranting replacement. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

<sup>4</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,538 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.336 million loan would amount to approximately \$86,000 per year. With 143 existing ratepayers, monthly bills would have to be

increased by \$50 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.10.2. Description of Urban Study Area**

A map showing the Miranda USA is attached as Figure 6-9. The Miranda USA is located in southern Humboldt County along the South Fork of the Eel River and U.S. Highway 101 near the southern entrance of the Avenue of the Giants. It lies between Myers Flat to the north and Phillipsville to the south.

The Miranda USA has 315 total acres, of which 113 acres are underdeveloped and/or vacant parcels. Of this total acreage, 86 acres within the USA are developable. With respect to development potential, the Miranda USA consists of mostly underdeveloped parcels with some vacant parcels. The area's land use guidelines and development potential are covered in the Avenue of the Giants Community Plan, which was last updated on April 11, 2000.

#### **6.4.10.3. Water System Service Area Description**

The Miranda USA is provided water service through the Miranda Community Services District (Miranda CSD). The governing board of the District is the Board of Directors, elected by the citizens of the District. The District was formed for the purpose of providing water, sewer, and fire protection services.

#### **System Standards**

Miranda CSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

According to Miranda CSD records, the District operates its water system on an annual budget of approximately \$70,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have no reserves.

#### **Water Demand**

Miranda CSD retails approximately 33 million gallons of drinking water per year, according to the 2005 CHS annual inspection report. Average daily use for the entire District is approximately 0.100 MGD and peak daily use is approximately 0.220 MGD. The Miranda USA has approximately 143 existing connections. Approximately 70% of households within the USA are serviced with water.

## **Water Supply, Treatment, Distribution and Storage**

The District's water source comes from two wells with rated capacities of 150 gpm and 85 gpm, for a total capacity of 0.338 MGD. The pumps are operated in a lead lag arrangement, with the larger pump leading during summer months and the smaller pump leading during winter months. There are 6-inch asbestos cement (AC) and ductile iron pipes from the wells to the treatment building. Continuous disinfection is provided through a BIF metering pump that injects calcium hypochlorite into the main line. The meter is switched on by the well pumps. Soda ash is used to raise the pH of the water, which is typically around 6.1. The District has 0.2 MG of total storage in the form of two 100,000 gallon tanks, one redwood and one bolted steel. The redwood tank was installed in 1964, and the bolted steel tank was installed in 1978. Both tanks are in good condition, although the redwood tank will likely need to be rehabilitated or replaced during this planning period.

The distribution system consists of one pressure zone, which is gravity fed by the two tanks. Low pressures are known to occur, especially in the School Road area, due to small diameter (2") mains. This problem is exacerbated when fire hydrants are in use. The District has 20 fire hydrants and approximately 3.5 miles of distribution piping.

The system has had some action level exceedances for copper and lead in the past, but these issues seem to have been resolved by the addition of soda ash feed.

### **Condition Assessment**

**Overview.** Water service within the Miranda USA is generally good. Current peak water use is at approximately 65% of available production capacity.

**Current Deficiencies.** The District does not meet several DHS requirements with respect to their water system. According to a 2004 DHS inspection report, the District does not have the ability to collect raw water samples at their larger well, has difficulty maintaining proper chlorine residuals within the system, and needs to improve their monitoring program for bacteria, lead and copper, pH, and asbestos. Some small diameter mains within the distribution system do not meet Waterworks standards.

The District is interested in replacing and/or upgrading main water lines, and is currently exploring grant funding options.

**Underserved Areas.** Some areas within the Miranda USA suffer from low water pressure.

### **Proposed Improvements**

**System Upgrades.** The District has no plans for system upgrades at this time. They are interested in replacing/and or upgrading main water lines if grant funding were found.

**Future Expansion.** The District has no plans for expansion of services or District boundaries.

**Cost and Schedule of Improvements.** The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

## **6.4.11. Orick USA & WSA**

The Orick study area contains both a USA and WSA. The County estimates there were 104 and 92 housing units within the Orick USA and WSA, respectively in 2005. Based on the County's housing

growth projections of between 0.5% and 2.5%, the Orick USA could have between 115 and 170 total housing units by 2025, while the Orick WSA could have between 102 and 151 total housing units by 2025. According to Table 1-6, the high build-out estimates for total development potential within the USA and WSA, which takes into consideration physical and zoning constraints, are 134 and 128, respectively. Therefore, the growth projections for each study area are in excess of what the land can bear.

The high build-out estimates for total development potential of 134 and 128 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 66 new housing units within the Orick USA and WSA.

#### **6.4.11.1. Summary**

##### **Findings**

Orick's water system is in good condition. The only major infrastructure deficiency associated with the existing system is lack of proper storage capacity. The storage tanks are constructed of redwood and will likely need either rehabilitation or replacement within the planning period. The Orick USA and WSA are expected to receive up to 66 new housing units before reaching build-out conditions. Orick will need to expand its water system infrastructure to serve this additional growth.

##### **Existing Capacity**

Orick's water system is currently limited by the source capacity of its wells with respect to availability of connections. Source capacity is limited by the existing pumps and is approximately 0.274 MGD if the pumps are operated 24 hours per day. Given existing maximum day demands are estimated at 0.216 MGD, the system is operating at approximately 79% of source capacity. Therefore, there are approximately 37 available connections under the existing infrastructure. Additional source capacity could be achieved through the installation of larger pumps within the existing well.

##### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Orick USA/WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA/WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-11. Water system infrastructure assessment for the Orick USA and WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	140
# of Available Connections <sup>1</sup>	37
Source Capacity (MGD)	0.274
Storage Capacity (MG)	0.2
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.216
Usage Rate (gpd/connection)	1,543
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.136 MG <sup>2</sup></i>	\$272,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$272,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$1,943</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$10.39</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	55
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.085 MG <sup>3</sup></i>	\$170,000
<i>Additional source capacity – larger pump for well</i>	\$20,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$190,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$3,455</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$462,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$2,369</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$12.66</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	66
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.102 MG <sup>3</sup></i>	\$204,000
<i>Additional source capacity – larger pump for well</i>	\$20,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$224,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$3,394</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$496,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$2,408</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$12.87</b>

NOTES: <sup>1</sup> The number of available connections in the Orick study areas was estimated based on the District currently being at 79% of its source capacity.

<sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.216 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.2 MG).

<sup>3</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,543 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$272,000 loan would amount to approximately \$17,500 per year. With 140 existing ratepayers, monthly bills would have to be increased by slightly over \$10 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing

deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.11.2. Description of Urban Study Area**

A map showing the Orick USA and WSA is attached as Figure 6-10. The study area is located in northern Humboldt County along U.S. Highway 101 amongst the Redwood National and State Parks. The Orick USA borders Redwood Creek and surrounds the main community center area. The Orick WSA contains four separate areas surrounding the Orick USA.

The Orick USA has 268 total acres, of which 47 acres are underdeveloped and/or vacant parcels. Of this total acreage, 18 acres within the USA are developable. The Orick WSA has 1,509 total acres, of which 660 acres are underdeveloped and/or vacant parcels. Of this total acreage, 178 acres within the WSA are developable. With respect to development potential, the Orick USA consists mainly of underdeveloped parcels and some smaller vacant parcels, while the Orick WSA contains mostly vacant parcels. The area's land use guidelines and development potential are covered in the Orick Community Plan, last updated on May 7, 1985; and the coastal zone portion of Orick is subject to the North Coast Area Plan, which was last updated on December 14, 1981.

#### **6.4.11.3. Water System**

##### **Service Area Description**

The Orick Community Services District (OCSD) was originally organized in 1955 pursuant to the Government Code. The governing board of the District is the Board of Directors, elected by the citizens of the District. The District was formed for the purpose of providing water and fire protection services. The downtown Orick portion of the USA is provided water service through the OCSD and the northern portion of the USA (containing the Redwood Parks Lodge Company property) is located outside the OCSD boundaries but within the OCSD SOI. Only the portion of the Orick WSA located south of Orick off of Hilton Road is not within the OCSD's sphere of influence; therefore, this portion of the WSA would need to be included within the SOI and annexed into the District prior to the OCSD extending service.

##### **System Standards**

OCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

##### **Fiscal Condition/Capital Replacement Program**

According to OCSD records, the District operates its water system on an annual budget of approximately \$62,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have approximately \$100,000 in reserves.

## Water Demand

OCSD retailed approximately 17 million gallons of drinking water in 2003 according to the 2007 DHS annual inspection report. The District does not maintain average daily use and maximum daily use statistics. However, from the DHS annual production data, it is estimated that average daily use for the entire District was approximately 0.047 MGD, and the District estimates peak daily use is approximately 0.216 MGD. The Orick USA has approximately 140 existing connections, of which approximately 120 are residential connections. Approximately 73% of households within the USA and WSA are serviced with water. Some homes in the northern region of the USA service area are not served with water as they are outside the OCSD boundaries.

## Water Supply, Treatment, Distribution and Storage

The initial Orick water system was built in 1977-1978 with funds obtained from the State of California under the Davis-Grunsky Program and the Farmers Home Administration at a cost of approximately \$400,000. At the time of planning the existing system, the need for water to service the area south of Orick was recognized but funding availability forced the curtailment of the project. Funding for the extension of the system was granted with aid from Redwood National Park in 1983.

The District maintains two active wells. One well has a capacity of 80 gpm, and the other has a capacity of 110 gpm, according to DHS inspection records, for a total production capacity of 0.274 MGD. The wells are operated manually, as well as the chlorination system. Wells are rotated into production manually each week. Continuous disinfection is achieved through a LMI Company positive displacement diaphragm feeder that directly injects chlorine into the well casings. The District maintains one pressure zone in its distribution system, serviced by approximately 6 miles of 4-inch through 8-inch PVC and AC pipe. The District's storage capacity includes two 100,000 gallon redwood storage tanks built in 1977 and 1987. This represents less than one day of storage.

## Condition Assessment

**Overview.** Water service within the Orick USA is generally good. Current peak water use is at approximately 79% of available production capacity.

**Current Deficiencies.** A significant deficiency of the current water system is its lack of proper storage – less than one day at maximum day demands. Having only 1 day (24 hours) of storage to meet the maximum daily demands is considered the minimum, and generally it is recommended that a District have at least two or three times that amount. Further, the storage tanks are constructed of redwood, are 20 and 30 years old, and will likely need rehabilitation or replacement within the planning period.

The system has also returned positive monitoring results for trihalomethanes and haloacetic acids in the recent past and efforts should be taken to minimize the presence of these disinfection byproducts. There is a leak present in the older of the two redwood storage tanks. The District is also in need of a cross connection control program to address actual and/or avoid potential connections between potable and non-potable water supplies.

**Underserved Areas.** Areas in the northern region of the USA are not served, as they are outside of District boundaries.

## Proposed Improvements

**System Upgrades.** OCSD does not have current plans for system upgrades or a capital improvement plan in place.

**Future Expansion.** The District has the capacity to expand water services; however, population numbers in the Orick Community are in decline. In the case that expansion occurs in the community, more water lines and service connections will need to be added. The OCSD would need LAFCo approval to extend service to areas outside the district boundaries and SOI described above.

**Cost and Schedule of Improvements.** The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

### 6.4.12. Redway USA

The County estimates there were 688 housing units within the Redway USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Redway USA could have between 760 and 1,127 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is 1,277. Therefore, the growth projections for the study area are within the range of what the land can bear.

The high build-out estimate for total development potential of 1,277 housing units in the USA was used for infrastructure assessment and recommendations. This represents 589 new housing units within the Redway USA.

#### 6.4.12.1. Summary

##### Findings

Redway's water system is in fair to good condition. The main infrastructure deficiency associated with the existing system is lack of proper treatment capacity. Some additional storage is also needed within the system, and some distribution system piping is in need of replacement and/or not of adequate size for proper fire flow protection. The Redway USA could receive up to 589 new housing units before reaching build-out conditions. Redway will need to expand its water system infrastructure to serve this additional growth.

##### Existing Capacity

Redway's water system is currently limited by the source capacity of its wells with respect to availability of connections. Source capacity is limited by the existing pumps and is approximately 0.838 MGD if the pumps are operated 24 hours per day. Given existing maximum day demands are estimated at 0.475 MGD, the system is operating at approximately 57% of source capacity. However, treatment capacity is limited to 0.46 MGD and therefore cannot meet present day maximum day demands. Therefore, there are no available connections under the existing infrastructure.

##### Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Redway USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-12. Water system infrastructure assessment for the Redway USA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	600
# of Available Connections <sup>1</sup>	0
Source Capacity (MGD)	0.838
Storage Capacity (MG)	0.375
Treatment Capacity (MGD)	0.46
Peak Day Use (MGD)	0.475
Usage Rate (gpd/connection)	792
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.220 MG <sup>2</sup></i>	\$440,000
<i>Additional treatment capacity – 0.015 MGD <sup>3</sup></i>	\$75,000
<i>Replace distribution piping – 2 miles <sup>4</sup></i>	\$1,056,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$1,571,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$2,618</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$14.00</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	298
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.236 MG <sup>5</sup></i>	\$472,000
<i>Additional treatment capacity – 0.251 MGD <sup>6</sup></i>	\$1,255,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$1,727,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$5,795</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$3,298,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$3,673</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$19.63</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	589
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.466 MG <sup>5</sup></i>	\$932,000
<i>Additional source capacity – 0.104 MGD</i>	\$200,000
<i>Additional treatment capacity – 0.482 MGD <sup>6</sup></i>	\$2,410,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$3,542,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$6,014</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$5,113,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$4,300</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$22.99</b>

- NOTES: <sup>1</sup> The number of available connections in the Redway study area was set at zero due to treatment capacity (0.46 MGD) being unable to meet peak day demands (0.475 MGD).  
<sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.475 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.375 MG).  
<sup>3</sup> Existing treatment capacity is 0.46 MGD, and maximum day demand is currently estimated at 0.475 MGD.  
<sup>4</sup> According to the DHS annual inspection report, the District has a number of old, undersized water mains. The report cites 4,000 feet of galvanized steel pipe that is mostly 2-inch. Some AC pipes also appear to be undersized for adequate fire flows, according to the County's GIS database. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).  
<sup>5</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 792 gpd/connection).  
<sup>6</sup> Future maximum day demands are estimated at 0.942 MGD. Existing source capacity is 0.838 MGD. This is assumed to include upgrades to infiltration gallery and water rights permitting.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.571 million loan would amount to approximately \$101,000 per year. With 600 existing ratepayers, monthly bills would have to be increased by approximately \$14 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.12.2. Description of Urban Study Area**

A map showing the Redway USA is attached as Figure 6-4. The USA encompasses Redway's community center along Redwood Drive and extends eastward to U.S. Highway 101. The Redway USA has 1,288 total acres, of which 850 acres are underdeveloped and/or vacant parcels. Of this total acreage, 469 acres within the USA are developable. With respect to development potential, approximately 30% of parcels within the Redway USA are considered vacant or underdeveloped parcels. The community center area and several vacant parcels in between Redwood Drive and U.S. Highway 101 have the most significant residential development potential.

The area's land use guidelines and development potential are covered in the Garberville, Redway, Benbow, and Alderpoint Community Plan, which was last updated on November 30, 2004.

#### **6.4.12.3. Water System Service Area Description**

The Redway USA receives water service from Redway Community Services District (RCSD). It is located within District boundaries and the Sphere of Influence. The RCSD was originally organized in 1965 pursuant to the provisions of Title 6, Division 2 of the Government Code. The Redway CSD is an independent special District with a five member elected Board of Directors. The term of office is four years. The District was formed for the purpose of providing water, sewer, fire protection, collection of garbage, and street lighting service. In 1977 the Redway Sanitary District was dissolved and combined with the Redway Community Services District. However, the Redway CSD provides only water and wastewater services.

#### **System Standards**

RCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

## **Fiscal Condition/Capital Replacement Program**

According to RCSD records, they operate their water system on an annual budget of approximately \$260,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District's latest Capital Improvement Plan was developed in 2006, and they currently have \$171,500 in reserves.

## **Water Demand**

An annual inspection report from the DHS has not been completed since 1997. According to the District, RCSD produces approximately 60 million gallons of drinking water per year. Average daily use was approximately 0.175 MGD, and peak daily use was approximately 0.419 MGD in 2006. Peak daily use was reported in a recent storage analysis performed by Spencer Engineering for the District as 0.475 MGD. The District has approximately 600 existing service connections and does not retail water to any other Districts.

## **Water Supply, Treatment, Distribution and Storage**

RCSD's water system consists of two water sources, a conventional filter water treatment plant, two storage facilities, two pressure reduction vaults, and one booster pump station, as well as the transmission and distribution lines, many of which were installed prior to 1950.

The sources of water are an infiltration gallery in the South Fork of the Eel River and an unnamed spring. The gallery has a reported capacity of 550 gpm, or 0.792 MGD. The maximum production for the spring is historically around 46,000 gallons per day. Total source capacity is estimated at 0.838 MGD. However, the water treatment plant design capacity is only 0.46 MGD, so treatment is limiting.

The total capacity of the two storage tanks is approximately 375,000 gallons. The District has a 275,000 gallon welded steel tank and a 100,000 gallon tank at a higher elevation that provides storage for the Meadows Industrial Park. The District maintains approximately 25 miles of distribution piping ranging in size from 1 ½ inches to 10 inches and consisting of iron, cement, and plastic pipe.

## **Condition Assessment**

**Overview.** Redway CSD's water system is in overall fair to good condition. However, treatment capacity is currently below maximum day demands. Some storage capacity fortunately exists to provide water during these periods, but storage capacity is insufficient to even meet one day of maximum day demands. Current peak day demands are about 57% of source capacity.

**Current Deficiencies.** Many parts of the distribution system are approaching 60 years old. The District is focusing on replacing antiquated sections of the current water system as time, funding, and conditions permit. The District also has a lack of proper storage to meet existing and future growth and fire suppression requirements. Treatment capacity is also insufficient to meet current maximum day demands.

We recommend that a water master plan, including a computerized hydraulic model of the system be completed to more accurately develop and prioritize the necessary improvements.

**Underserved Areas.** The District currently serves all areas within its service boundaries. However, areas north and east of the present community center will provide major challenges in providing services due to topography and existing infrastructure capacity limitations.

## Proposed Improvements

**System Upgrades.** The District is in the process of developing a five to twenty year plan that will address current infrastructure deficiencies as well as a proposal to upgrade the water transmission and distribution lines. The District does not have any other major plans for new infrastructure at this point. Its efforts are focused on replacing antiquated sections of the current water system as time, funding, and conditions permit.

**Future Expansion.** There are areas within the District that are in the planning stages of subdivision; the developer would have to provide the needed additional storage capacity and infrastructure to enable the District to provide services to these additional customers. LAFCo would also need to approve an expansion of the District SOI and boundaries for this service extension to occur.

**Cost and Schedule of Improvements.** The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

### 6.4.13. Rio Dell USA & WSA

The Rio Dell study area contains both a USA and WSA. The County estimates there were 5 and 31 housing units within the Rio Dell USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Rio Dell USA could have between 6 and 8 total housing units by 2025, while the Rio Dell WSA could have between 34 and 51 total housing units by 2025. According to Table 1-6, the high build-out estimates for total development potential within the USA and WSA, which takes into consideration physical and zoning constraints, are 13 and 38, respectively. Therefore, the growth projections for the USA are within the range of what the land can bear, but estimates for the WSA are in excess of what the land can bear.

The high build-out estimates for total development potential of 13 and 38 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 15 new housing units within the Rio Dell USA and WSA.

#### 6.4.13.1. Summary

##### Findings

The City of Rio Dell's water system is in very good condition. The City has made significant improvements to its water system over the past few years. There are currently no major infrastructure deficiencies associated with the existing system. The City has sufficient storage to meet the recommended two days of maximum day usage with fire suppression flows. While much of the original private system has been replaced, there are some portions that still need replacement. The Rio Dell USA and WSA are expected to experience minimal growth in the following twenty years, but the City is expected to experience larger growth. Rio Dell will need to expand its water system infrastructure to serve this additional growth.

##### Existing Capacity

Rio Dell's water system is currently limited by the source capacity of its infiltration gallery with respect to availability of connections. Source capacity is limited by the existing pumps and is approximately 0.792 MGD if the pumps are operated 24 hours per day. Given existing maximum day demands are estimated at 0.474 MGD, the system is operating at approximately 60% of source capacity. Therefore, there are approximately 786 available connections under the existing infrastructure.

## Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Rio Dell USA/WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA/WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed. The existing capacity of the system includes connections within the City of Rio Dell as well.

**Table 6-13. Water system infrastructure assessment for the Rio Dell USA and WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	1,179
# of Available Connections <sup>1</sup>	786
Source Capacity (MGD)	0.792
Storage Capacity (MG)	1.1
Treatment Capacity (MGD)	0.924
Peak Day Use (MGD)	0.474
Usage Rate (gpd/connection)	402
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Upgrade distribution system - 5 miles <sup>2</sup></i>	\$2,640,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$2,640,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$2,239</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$11.97</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	9
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed <sup>3</sup></i>	\$0
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$0</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$0</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$2,640,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$2,222</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$11.88</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	15
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed <sup>3</sup></i>	\$0
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$0</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$0</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$2,640,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$2,211</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$11.82</b>

NOTES: <sup>1</sup> The number of available connections in the Rio Dell study area was estimated based on the City currently being at 60% of its source capacity.

<sup>2</sup> It is assumed that approximately 5 miles of pipe are still in need of replacement following the City's recent Water System Improvements Project. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

<sup>3</sup> Existing storage is sufficient to meet both existing and future domestic and fire storage requirements. Source and treatment capacity are also sufficient.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in

the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$2.64 million loan would amount to approximately \$169,000 per year. With 1,179 existing ratepayers, monthly bills would have to be increased by approximately \$12 per month to fund this loan. In reality, we would expect the City to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.13.2. Description of Urban Study Area**

A map showing the City of Rio Dell's USA and WSA is attached as Figure 6-11. There are two areas within the Rio Dell USA, each located within the City's sphere of influence. These include (from south to north):

1. An area south of the City's boundary near Grayland Heights and located between the Eel River and Dean Creek.
2. A rectangular area on the Dinsmore Plateau surrounded on three sides by the City

The area on the Dinsmore Plateau is within the City's sphere of influence but does not hold much development potential for the County. Most existing residents are not in favor of annexation to the City, except for some who would like to subdivide their parcels. However, annexation of the parcels that have expressed interest in annexing and subdividing would create an "island" of unincorporated land within a City and would therefore not be allowed under current LAFCO guidelines. The area near Grayland Heights offers slightly more development potential. The Rio Dell WSA is located just southeast of the City boundary along Monument Road.

The Rio Dell USA has 87 total acres, of which 6 acres are underdeveloped and/or vacant parcels. Of this total acreage, 4 acres within the USA are developable. The Rio Dell WSA has 166 total acres, of which 46 acres are underdeveloped and/or vacant parcels. Of this total acreage, 40 acres within the WSA are developable. The area's land use guidelines and development potential are covered in the City of Rio Dell General Plan, which was last updated in October 2003.

#### **6.4.13.3. Water System Service Area Description**

The City of Rio Dell is the only service provider within the Rio Dell USA or Rio Dell WSA. All proposed study areas would receive water service from the City of Rio Dell.

#### **System Standards**

The City of Rio Dell's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

The City of Rio Dell has established improvement standards for all City owned infrastructure. To the extent that new development areas are annexed to the City, infrastructure development would be subject to these standards. To the extent that existing development is annexed, the City may apply existing development standards and require that all existing infrastructure be upgraded.

### **Fiscal Condition/Capital Replacement Program**

According to City of Rio Dell records, they operate their water system on an annual budget of approximately \$575,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The City is developing a new Capital Improvement Plan to date, and they currently have not built up reserves.

### **Water Demand**

According to the 2005 DHS annual inspection report, the City produced 97.5 million gallons of drinking water in 2004. Average daily use is estimated at 0.267 MGD, and peak daily use was reported as 0.474 MGD. However, these demand figures may be slightly high, as they are from 2004, before the City invested heavily into repairing its distribution system to minimize water losses. In 2006, the City only produced 91.1 MG of drinking water, representing approximately 7% decrease as compared to 2005. It is unclear what part of this decrease is attributable to the water system improvements versus natural variability in demands.

The City has approximately 1,179 connections within the system, of which approximately 96% are residential connections. The City also serves 49 commercial connections, two landscape connections, and two agricultural connections.

### **Water Supply, Treatment, Distribution and Storage**

The City's water supply comes from a recently completed infiltration gallery in the South Fork of the Eel River. The production capacity of the gallery is tied to water levels within the river, such that in the winter the pumps can deliver around 700gpm, but in the summer production falls to about 550 gpm (0.792 MGD). Water is pumped to treatment for filtration and disinfection before entering the City's distribution system. The City has two pressure zones served by four tanks ranging in size from 100,000 gallons to 500,000 gallons for a total combined storage capacity of 1.1 million gallons. The distribution system contains approximately 11 miles of pipe, of which 5 miles were replaced with 10" HDPE pipe under the City's infrastructure rehabilitation project. The remaining distribution system ranges in size from 4 inches to 6 inches and consists mainly of AC pipe.

The City has recently invested heavily in upgrading its water system following a declared water emergency in 2001 when the City's water supply began to fail. Since then, they have received \$5.0 million in grant funds to rehabilitate the water distribution system City-wide and \$1.0 million in grant funds and a loan in the amount of \$2.3 million to construct a new infiltration gallery and water treatment plant. The new treatment plant has a design capacity of 700 gpm.

### **Condition Assessment**

**Overview.** The City of Rio Dell has invested over \$8 million in its water system over the past couple years. The system is in very good condition overall and has sufficient capacity to accommodate growth anticipated in Rio Dell's new General Plan currently in the process of being updated. Current peak day demands are about 60% of source capacity.

**Current Deficiencies.** There are no current deficiencies associated with Rio Dell's water system.

**Underserved Areas.** The City serves all areas within its service boundaries.

### **Proposed Improvements**

**System Upgrades.** The City has made significant improvements to its water system over the past few years. The City does not have any other major plans for new infrastructure at this point, and is now refocusing upgrade efforts to wastewater infrastructure.

**Future Expansion.** The City of Rio Dell has no major plans for expansion at this time.

**Cost and Schedule of Improvements.** The City of Rio Dell is in the process of developing a new Capital Improvement Plan since completing its recent Water System Improvements Project.

## **6.4.14. Samoa USA**

The County estimates there were 104 housing units within the Samoa USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Samoa USA could have between 115 and 170 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is 422. Therefore, the growth projections for the study area are within the range of what the land can bear.

The high build-out estimate for total development potential of 422 housing units in the USA was used for infrastructure assessment and recommendations. This represents 318 new housing units within the Samoa USA.

### **6.4.14.1. Summary**

#### **Findings**

Samoa's water system is in poor condition. The existing system has been purchased by Samoa Pacific Group, LLC and will be completely upgraded as part of the Samoa Town Master Plan proposed development. The Samoa USA is expected to receive an additional 318 units in the following twenty years.

#### **Existing Capacity**

Samoa's existing water system is not limited by either source or treatment capacity with respect to its availability of connections. HBMWD has sufficient water supply to meet study area demands.

#### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Samoa USA and addresses infrastructure needs for existing development and for build-out conditions. The Samoa Town proposal is a major planned development within the USA still in the planning phases.

**Table 6-14. Water system infrastructure assessment for the Samoa USA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	104
# of Available Connections <sup>1</sup>	---
Source Capacity (MGD)	Not limiting (HBMWD)
Storage Capacity (MG)	Future development
Treatment Capacity (MGD)	Not required
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.172 MG<sup>2</sup></i>	\$344,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$344,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$3,308</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$17.68</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	0
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed</i>	\$0
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$0</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$0</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$344,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$3,308</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$17.68</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	318
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.159 MG<sup>3</sup></i>	\$318,000
<i>Additional distribution capacity – 0.5 miles<sup>4</sup></i>	\$264,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$582,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$1,830</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$926,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$2,194</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$11.73</b>

NOTES: <sup>1</sup> There is sufficient source supply from HBMWD to serve all development potential within the USA.

<sup>2</sup> Additional storage requirements are based on 1 day of estimated maximum day use (500 gpd/connection x 104 connections = 0.211 MG) plus minimum fire storage of 120,000 gallons.

<sup>3</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (318 new connections x 500 gpd/connection).

<sup>4</sup> It is estimated that the Samoa Town Master Plan will require approximately 0.5 miles of new distribution system installation.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$344,000 loan would amount to approximately \$22,000 per year. With 104 existing ratepayers, monthly bills would have to be increased by approximately \$18 per month to fund this loan. In the case that the Samoa Town development occurs, infrastructure will be constructed to correct existing deficiencies and serve the future development.

Future connections should buy into the existing infrastructure through connection fees in order to ensure replacement costs are collected to replace the infrastructure in the future.

#### **6.4.14.2. Description of Urban Study Area**

A map showing the Samoa USA is attached as Figure 6-7. The USA encompasses a small residential and industrial area just north of the LP Samoa pulp mill and south of the intersection of New Navy Base Road and Cookhouse Road. The Samoa USA has 301 total acres, of which 69 acres are underdeveloped and/or vacant parcels. Of this total acreage, 68 acres within the USA are developable. With respect to development potential, the Samoa USA contains a large underdeveloped parcel that borders the Peninsula Elementary School to the west and is situated between New Navy Base Road and Vance Avenue that could see further residential development.

The area's land use guidelines and development potential are covered in the Humboldt Bay Area Plan. The Samoa Town Master Plan is under review by Humboldt County, and if approved will amend the Humboldt Bay Area Plan.

#### **6.4.14.3. Water System Service Area Description**

Existing residences within the Samoa USA receive water service from the Samoa Pacific Group, LLC, who is a retail customer of HBMWD. The Samoa Pacific Group, LLC purchased the town of Samoa from the Simpson-Samoa Company in 2001 and has provided water service since then. The Samoa Pacific Group LLC has developed a master plan for the town of Samoa, whose Draft EIR was released in January 2006 and is being recirculated in 2007 to address changes to the master plan. Humboldt County Community Development Services Department is the lead agency for the proposed project. The EIR indicates the Group is interested in forming a management entity to serve the existing and proposed development within the town. However, what from this entity will take on has not been specified.

#### **System Standards**

The Samoa Pacific Group, LLC's water system is currently a private water system. However, public water system standards apply to private water systems that serve over 25 people for more than 60 days per year. Therefore, the Group's water system must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

It has not been determined who will serve the future Samoa Town. The condition of approval required by the EIR is that a management entity be formed to provide water service to the Samoa Town.

#### **Fiscal Condition/Capital Replacement Program**

There is no fiscal condition to be reported as a service provider has yet to be created for the USA.

#### **Water Demand**

According to the Samoa Town Master Plan Draft EIR, the Samoa Pacific Group, LLC has contracted with HBMWD to receive up to 0.450 MGD of treated water. Estimated average day flows for the proposed Samoa Town are approximately 0.175 MGD, while peak day flows are being estimated at around 0.315 MGD. Samoa Town currently has approximately 104 connections, while the proposed development would add approximately 318 more residential connections and several industrial connections.

## **Water Supply, Treatment, Distribution and Storage**

The Samoa Pacific Group, LLC has proposed to completely upgrade the existing domestic distribution system to serve the proposed Samoa Town, including main lines, connections, meters, and fire hydrants. Water supply will continue to be provided through HBMWD, although the District will likely wholesale water to the newly formed service providing entity. The Samoa Pacific Group, LLC has also proposed a new 500,000 gallon storage tank to serve the proposed development. Water quality is representative of HBMWD's excellent water source and meets or exceeds State standards.

### **Condition Assessment**

**Overview.** The existing distribution system is in poor condition. Water use averages about three to four times higher than would be expected for the existing service population, indicating significant leaks in the system. The system will be reconstructed as part of the Samoa Town Master Plan.

Formation of a management entity to serve the Town of Samoa will require LAFCO approval. However, according to LAFCO's Municipal Service Review guidelines, one of the main factors used in consideration of an entity's formation is whether existing services can be expanded to eliminate duplicate infrastructure construction. The Manila CSD's service boundary is less than one mile north of the proposed development. The Manila CSD has indicated they are interested in serving the development as long as the developer is willing to fund the studies, permits, and required infrastructure.

**Current Deficiencies.** There are significant losses that occur in the existing water system.

**Underserved Areas.** There are no underserved areas within the USA.

### **Proposed Improvements**

**System Upgrades.** The Samoa Pacific Group, LLC has proposed to upgrade the entire domestic distribution system as a part of its development proposal. Water storage will also be provided as part of the project to provide for domestic and fire uses in case of a power outage or catastrophic failure on the Peninsula supply line.

**Future Expansion.** Approximately 318 residences and several commercial and industrial connections will be added to the existing distribution system as a result of the proposed development.

**Cost and Schedule of Improvements.** There is no plan to date that covers costs and schedules for improvements to the water system.

## **6.4.15. Scotia USA**

The County estimates there were 270 housing units within the Scotia USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Scotia USA could have between 298 and 442 total housing units by 2025. However, according to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is 270. In addition, Scotia is built out with limited vacant parcels available for development and natural barriers, such as the Eel River further limit development. Therefore, zero growth has been projected for this USA.

The Scotia system is currently owned by the Pacific Lumber Company (PALCO). PALCO currently has filed an application with LAFCO for the formation of a CSD, which includes a Municipal Service Review (SHN 2007). In addition the City of Rio Dell has studied the potential for annexation (Winzler & Kelly, 2006). Those documents provide additional details about this USA.

#### **6.4.15.1. Summary**

##### **Findings**

Scotia's water system is in fair condition. The distribution system was installed in the 1930's and 1940's and is in need of significant repair and replacement (Winzler & Kelly, 2006). New distribution and service lines, along with individual water meters are needed before this system would meet current City or CSD standards. The treatment system on the other hand is in good condition and has plenty capacity. Storage capacity within the town is also well in excess of recommended storage levels. The Scotia USA is not expected to grow in the following twenty years.

##### **Existing Capacity**

Scotia's water system is currently limited by the source capacity of its infiltration gallery with respect to availability of connections. Source capacity is limited by the existing pumps at the domestic booster pump station and is estimated at 1.728 MGD if the pumps are operated 24 hours per day. Given existing maximum day demands are estimated at 0.384 MGD, the system is operating at approximately 22% of source capacity. Therefore, there are approximately 1,117 available connections under the existing infrastructure.

##### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Scotia USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-15. Water system infrastructure assessment for the Scotia USA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	315
# of Available Connections <sup>1</sup>	1,117
Source Capacity (MGD)	1.728
Storage Capacity (MG)	1.488
Treatment Capacity (MGD)	1.8
Peak Day Use (MGD)	0.384
Usage Rate (gpd/connection)	1,219
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Replace distribution piping – 3 miles <sup>2</sup></i>	\$1,584,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$1,584,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$5,029</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$26.88</b>
<b>LOW &amp; HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	0
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed <sup>3</sup></i>	\$0
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$0</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$0</b>

NOTES: <sup>1</sup> The number of available connections in the Scotia study area was estimated based on the District currently being at 22% of its source capacity.

<sup>2</sup> According to the Scotia annexation study, a minimum of three miles of pipeline are in need of replacement.

<sup>3</sup> Source and treatment capacity and available storage are sufficient.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.584 million loan would amount to approximately \$102,000 per year. With 315 existing ratepayers, monthly bills would have to be increased by approximately \$27 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.15.2. Description of Urban Study Area**

A map showing the Scotia USA is attached as Figure 6-11. The USA encompasses the town of Scotia, including its commercial, residential and industrial areas between the Eel River and U.S. Highway 101. There is currently no development potential in the Scotia USA.

Scotia's commercial town center, industrial activity, and residential areas comprise the Scotia USA. The County has not prepared development estimates for the USA to date, as the town is still

owned by PALCO. In 2003, to make the town's zoning more consistent with the County General Plan, PALCO requested zone changes for some areas. The Humboldt County Board of Supervisors approved the "Scotia Consistency Rezoning Project" which rezoned approximately 257 acres of industrial and commercial areas that were previously zoned Unclassified (U). (The project did not include any changes to the town's existing General Plan land use designations.) Approximately 245 acres of land, having the Industrial General (IG) General Plan land use designation, was changed from Unclassified (U) zone to Heavy Industrial, Qualified (MH/Q) zone under the Humboldt County Code. The remaining 12 acres of land, having the Commercial General (CG) land use designation, were changed from the U zone to Community Commercial, Qualified (C-2/Q) zone. The Qualifying (Q) combining zone was applied to include development restrictions for both zones (MH/Q and C-2/Q) in order to protect historic resources. PALCO is currently in the process of subdividing the town so that individual lots can be sold.

PALCO is in the process of selling its holdings within the town and determining how to serve residential and commercial areas in Scotia with essential services, including water. Options under consideration include either annexation to Rio Dell or formation of a Community Services District (CSD).

The Scotia USA has 464 total acres. No determination has been made by the County as to how much of this land is underdeveloped and/or vacant, or how much is developable. As part of the subdivision review, a California Environmental Quality Act Environmental Review document will be released which assesses current land uses in Scotia, and available land for development. The area's land use guidelines and development potential are covered in the Humboldt County General Plan.

#### **6.4.15.3. Water System Service Area Description**

The Scotia USA currently receives water service from PALCO, who owns, operates, and maintains the town's domestic water system. PALCO is interested in divesting its holdings in the town's infrastructure, including its water system. It is unclear at this point in time which option will be the most viable for PALCO and the residents of Scotia.

#### **System Standards**

PALCO's water system is a private water system. However, public water system standards apply to private water systems that serve over 25 people for more than 60 days per year. Therefore, the Group's water system must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

PALCO's is under reorganization as defined by a Chapter 11 bankruptcy, and the strategy for the reorganization is not public at this time. Nonetheless, a functioning water system is part of the core operation for industrial activity and funds are devoted to maintaining and improving the water system.

#### **Water Demand**

According to an analysis performed by Winzler & Kelly in 2006, average day production at Scotia's water treatment facility was estimated at 0.412 MGD, with approximately 0.151 MGD used by Scotia's industrial customers and the remaining 0.261 MGD used by the remaining residential and commercial customers. According to the 2005 annual report to DHS, peak day flows in Scotia were estimated at 0.606 MGD. Assuming a similar percentage usage for industrial

uses, the domestic water peak demand is estimated at 0.384 MGD. Scotia currently has approximately 280 residential connections, 15 commercial connections, and 20 industrial connections.

Using PALCO estimates of the current population and percentage of vacant homes in Scotia, Winzler & Kelly (2006) estimated a per capita water usage of 283 gpcd (not including industrial uses). These water use estimates are approximately *two to three times* that expected for a community such as Scotia, with primarily single family homes, indicating significant losses from the distribution system. Water usage in the town of Scotia is also currently unmetered, which creates no financial incentive to conserve water.

### **Water Supply, Treatment, Distribution and Storage**

PALCO's water supply comes from an infiltration gallery in the Eel River that supplies both a domestic water and fire system. The domestic system is fed by a domestic booster pump station with a firm capacity of 1.728 MGD. Water is pumped to a one million gallon raw water storage tank which also serves as a clarifier/settling tank. Raw water then flows by gravity through the water treatment facility for filtration and disinfection prior to entering a 0.488 MG finished water storage tank that serves the City's distribution system. The treatment capacity of the WTF is approximately 1.8 MGD. The distribution system contains approximately seven miles of pipeline ranging in size from 1 inch to 8 inches in diameter and consisting mainly of cast-iron and steel pipe installed in the 1930's and 1940's.

### **Condition Assessment**

**Overview.** The existing water treatment plant is generally in good condition. However, some improvements are needed at the treatment plant and the distribution system is in poor condition and will require significant upgrading and replacement. Water use averages about two to three times higher than would be expected for the existing service population, indicating significant leaks in the system.

Current peak water use is at approximately 22% of available production capacity.

**Current Deficiencies.** There are significant losses that occur in the existing water system. The existing water distribution system is combined so that it provides fire flows to both the mill and residential properties. If the town is to be subdivided as is currently being proposed, improvements to the fire protection system will also be required. Currently, none of the residents have water meters.

**Underserved Areas.** There are no underserved areas within the USA.

### **Proposed Improvements**

**System Upgrades.** System upgrades will largely depend on which option PALCO chooses to divest itself of the water infrastructure. Under the proposed annexation alternative, PALCO would retain a separate fire protection system to serve their properties, and the domestic water system would be upgraded to provide fire protection to the residential and commercial areas. While some of the existing fire mains can be reused, the vast majority of the distribution system will require new construction. New valves and fire hydrants will also be needed, and the two systems will be tied together to operate as one. New water services with meters would be required for the residential and commercial connections.

The decision on whether this USA is served by a CSD or is annexed to the City of Rio Dell will be determined by LAFCO. A critical issue in this decision will be to determine how the necessary upgrades and the operation and maintenance will be funded.

**Future Expansion.** There are currently no plans for future expansion.

**Cost and Schedule of Improvements.** There is no plan to date that covers costs and schedules for improvements to the water system. This will largely depend on the future of water service within the Scotia USA.

#### **6.4.16. Shelter Cove USA & WSA**

The Shelter Cove study area contains both a USA and WSA. The County estimates there were 441 and 133 housing units within the Shelter Cove USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Shelter Cove USA could have between 487 and 723 total housing units by 2025, while the Shelter Cove WSA could have between 117 and 174 total housing units by 2025. According to Table 1-6, the high build-out estimates for total development potential within the USA and WSA, which takes into consideration physical and zoning constraints, are 1,655 and 400, respectively. Therefore, the growth projections for each study area are within the range of what the land can bear. It should be noted that this projection assumes that the Shelter Cove water provider, Resort Improvement District #1 (RID), is able to locate an additional source of water. Without additional water, development potential would be limited to the maximum based on RID permitted capacity, 990 dwelling units.

The high build-out estimates for total development potential of 1,655 and 400 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 1,481 new housing units within the Shelter Cove USA and WSA, subject to the caveat described above.

##### **6.4.16.1. Summary**

###### **Findings**

Shelter Cove's water system is in good condition. There are no major infrastructure deficiencies associated with the existing system. Some older coal tar coated steel pipe is in need of replacement. The Shelter Cove USA and WSA are expected to receive up to 1,481 new housing units before reaching build-out conditions, based on available developable land. The RID water right only allows for a total of 990 water connections, so new water sources will need to be developed to satisfy future build-out demands for water. Shelter Cove will need to expand its water system infrastructure to serve this additional growth, which was planned as a part of the original subdivision.

###### **Existing Capacity**

Spring production is estimated at 0.732 MGD over a 24 hour period for both Telegraph Creek intakes and Rick Spring. Given existing maximum day demands are estimated at 0.331 MGD, the system is operating at approximately 45% of source capacity. Therefore, there are approximately 556 available connections under the existing infrastructure. However, the District's existing water right currently limits connections to 990 total connections.

###### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Shelter Cove USA/WSA and addresses infrastructure needs for existing development and for build-out conditions. There are

no planned developments within the USA/WSA, as the area was completely subdivided under the original plans that created this development.

**Table 6-16. Water system infrastructure assessment for the Shelter Cove USA and WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	455
# of Available Connections <sup>1</sup>	535
Source Capacity (MGD)	0.36
Storage Capacity (MG)	2.1
Treatment Capacity (MGD)	0.462
Peak Day Use (MGD)	0.331
Usage Rate (gpd/connection)	727
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Replace distribution piping – 1 mile <sup>2</sup></i>	\$528,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$528,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$1,160</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$6.20</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	1,196
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional source capacity – new wells</i>	\$100,000
<i>Additional treatment capacity – 0.739 MGD</i>	\$3,695,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$3,795,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$3,173</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$4,323,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$2,618</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$14.00</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	1,481
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional source capacity – new wells</i>	\$100,000
<i>Additional treatment capacity – 0.946 MGD</i>	\$4,730,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$4,830,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$3,261</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$5,358,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$2,768</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$14.79</b>

NOTES: <sup>1</sup> The number of available connections in the Shelter Cove study area was estimated based on the District's limitation of 990 total connections, imposed by the California Department of Health Services.

<sup>2</sup> According to the latest DHS annual inspection report, 1 mile of coal tar coated steel pipe is in fair condition and is in need of replacement.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$528,000 loan would amount to approximately \$34,000 per year. With 455 existing ratepayers, monthly bills would have to be increased by approximately \$6 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In

addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.16.2. Description of Urban Study Area**

A map showing the Shelter Cove USA and WSA is attached as Figure 6-12. The Shelter Cove study area is located in Southern Humboldt along the coast approximately 20 miles southwest of Redway. The USA encompasses the lower portions of Shelter Cove's residential areas closest to the town center, while the WSA extends from the east boundary of the USA into the mountains.

The Shelter Cove USA has 873 total acres, of which 160 acres are underdeveloped and/or vacant parcels. Of this total acreage, 155 acres within the USA are developable. The Shelter Cove WSA has 1,899 total acres, of which 230 acres are underdeveloped and/or vacant parcels. Of this total acreage, 87 acres within the WSA are developable. With respect to development potential, the Shelter Cove USA and WSA contain mostly vacant parcels that could see further residential development. The area's land use guidelines and development potential are covered in the South Coast Area Plan and the Shelter Cove Community Plan Area.

#### **6.4.16.3. Water System Service Area Description**

The Shelter Cove USA and WSA either receive or could receive water service from the RID, as both areas are located within the RID sphere of influence. The RID was formed in February 1965 pursuant to the provisions of the Public Resources code. The District was created for the purpose of installing and maintaining facilities and providing services within the Shelter Cove Sea Park Subdivision and is now the only such District remaining in the State.

Resort Improvement Districts were envisioned as a vehicle for installing and maintaining necessary improvements within recreational resort areas. The Shelter Cove Sea Park Subdivision was originally planned as a retirement community and area for second-home, recreational development. The initial subdivision of the area created 4,715 residential lots. Since that time, several additional parcels have been annexed to the District. The total number of parcels has decreased, however, because of consolidations of undevelopable lots. Further reductions are anticipated in the future as additional consolidations occur and as Bureau of Land Management (BLM) acquisitions continue.

#### **System Standards**

RID's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

According to RID records from 2006/2007, they operate their water system on an annual budget of approximately \$528,000. The majority of this income is from service charges, but funding also

comes from property taxes, special taxes, standby assessments, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District's latest Capital Improvement Plan was developed in 2006, and they currently do not have built up reserves.

### **Water Demand**

The RID produced approximately 57.4 million gallons of drinking water in 2004, according to the 2006 DHS annual inspection report. Average daily use is therefore estimated at 0.157 MGD, and peak daily use was reported as 0.331 MGD in 2004. The District has approximately 455 existing connections and does not retail water to any other Districts. The number of water connections available to the RID is limited by its permit to a total of 990. As a result, the RID cannot approve new connections equal to the total development potential identified above until it identifies an additional source of water and expands its permitted water right.

### **Water Supply, Treatment, Distribution and Storage**

RID's water source consists of two active surface water spring intakes, a seasonal standby surface water spring intake, and two standby wells. The two active sources are known as Rick Spring and Upper Telegraph Creek Intake, while the seasonal standby source is Lower Telegraph Creek Intake. During summer months when demands are high, the District is required to maintain environmental flows within Telegraph Creek but are allowed to withdraw at Lower Telegraph Creek at a point prior to the water's infiltration into beach sands. The source capacity of the District is approximately 508 gpm (0.732 MGD), well over existing maximum day demands (230 gpm). Water is gravity fed or pumped to an Eimco package filtration plant with flocculation, sedimentation, dual media filtration, and pre- and post-chlorination. The treatment capacity of the plant is 350 gpm, or 0.504 MGD.

The District maintains approximately 2.1 MG of storage in 12 storage tanks (welded steel and redwood) ranging in size from 0.03 MG to 1 MG. There are multiple pressure zones within the District served by approximately thirteen booster stations and two pressure reducing valves. The distribution system consists of approximately 44 miles of water main of varying size. The majority of the distribution system is AC pipe, but some coal tar coated steel and PVC is also present.

### **Condition Assessment**

**Overview.** Water service within the RID is generally very good. No major flaws were found with the system according to the latest DHS inspection. The District's DHS permit limits water service connections to 990 connections per a 1997 amendment.

Current peak water use is at approximately 45% of available production capacity. The District is in the process of locating additional source capacity.

**Current Deficiencies.** Peak water use within the District is very near its source capacity. Additional water sources are needed.

**Underserved Areas.** The District serves most areas within its service boundaries.

### **Proposed Improvements**

**System Upgrades.** The City developed a CIP in 2006 which outlines planned upgrades for the next ten years. These include but are not limited to water plant upgrades, water main replacement, and water source capacity design and expansion. Other smaller projects include

adding horizontal bores at Rick Spring to increase flow, replacing several smaller tanks with larger tanks, and painting steel tanks.

**Future Expansion.** The District is interested in serving any planned development within the USA.

**Cost and Schedule of Improvements.** The District has developed a Capital Improvement Plan that covers costs and schedules for improvements to its water system. The District has plans to spend over \$3 million over the next ten years to upgrade the water treatment plant and replace water mains. Another \$3 million dollars are set aside for water source capacity expansion, and approximately \$3 million dollars for additional storage capacity.

### **6.4.17. Weott USA**

The County estimates there were 152 housing units within the Weott USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Weott USA could have between 168 and 249 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the USA, which takes into consideration physical and zoning constraints, is 213. Therefore, the high rate growth projection for the study area is in excess of what the land can bear.

The high build-out estimate for total development potential of 213 housing units in the USA was used for infrastructure assessment and recommendations. This represents 61 new housing units within the Weott USA.

#### **6.4.17.1. Summary**

##### **Findings**

Weott's water system is in fair condition and suffers supply problems during summer months. A new well of unknown capacity has been developed but has not been placed on line due to poor water quality and lack of treatment at the present time to treat iron and manganese in the well water. Weott's existing treatment system, not designed for iron and manganese removal, is also severely under capacity. Weott's distribution system is all four-inch pipe or smaller diameter, which does not provide sufficient fire flows as set forth by California Fire Code standards.

The Weott USA could receive up to 61 new housing units before reaching build-out conditions. Weott will need to expand its water system infrastructure to serve this additional growth.

##### **Existing Capacity**

Weott's water system is currently limited by both its source and treatment capacity with respect to its availability of connections. However, treatment capacity is currently more limiting. Source capacity is limited by the District's spring sources and is estimated at 0.202 MGD if the pumps are operated 24 hours per day. The treatment capacity is limited by filtration and is estimated at 0.113 MGD if the filters are operated 22 hours per day (time allowed for backwash cycle). Given existing maximum day demands are 0.258 MGD, the system is operating in excess of both source and treatment capacity. Therefore, there are no available connections under the existing infrastructure.

##### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Weott USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned

developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-17. Water system infrastructure assessment for the Weott USA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	140
# of Available Connections <sup>1</sup>	0
Source Capacity (MGD)	0.202
Storage Capacity (MG)	0.169
Treatment Capacity (MGD)	0.113
Peak Day Use (MGD)	0.258
Usage Rate (gpd/connection)	1,843
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.209 MG <sup>2</sup></i>	\$418,000
<i>Fe/Mn treatment capacity – 0.258 MGD <sup>3</sup></i>	\$516,000
<i>Conventional treatment capacity – 0.145 MGD <sup>4</sup></i>	\$725,000
<i>Replace distribution piping – 1.5 miles <sup>5</sup></i>	\$792,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$2,451,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$17,507</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$93.59</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	34
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.063 MG <sup>6</sup></i>	\$126,000
<i>Fe/Mn treatment capacity – 0.321 MGD <sup>3</sup></i>	\$642,000
<i>Conventional treatment capacity – 0.063 MGD <sup>4</sup></i>	\$315,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$1,083,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$31,853</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$3,534,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$20,310</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$108.57</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	61
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.112 MG <sup>6</sup></i>	\$224,000
<i>Fe/Mn treatment capacity – 0.371 MGD <sup>3</sup></i>	\$742,000
<i>Conventional treatment capacity – 0.112 MGD <sup>4</sup></i>	\$560,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$1,526,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$25,016</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$3,977,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$19,786</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$105.77</b>

NOTES: <sup>1</sup> The number of available connections in the Weott USA was set at zero due to source and treatment capacity being currently exceeded.

<sup>2</sup> Additional storage requirements are based on 1 day of maximum day use (0.258 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.169 MG).

<sup>3</sup> Iron and manganese removal is needed for both existing and future maximum day demands of 0.321 MGD under the low build-out scenario and 0.371 for the high build-out scenario.

<sup>4</sup> Existing treatment facility has an estimated capacity of 0.113 MGD. Future maximum day demands are estimated at 0.321 MGD for low build-out and 0.371 MGD for high build-out.

- <sup>5</sup> According to the DHS annual inspection report, approximately 1.5 miles of the distribution system is steel pipe in fair condition. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).
- <sup>6</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,843 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$2.451 million loan would amount to approximately \$157,000 per year. With 140 existing ratepayers, monthly bills would have to be increased by approximately \$94 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.17.2. Description of Urban Study Area**

A map showing the Weott USA is attached as Figure 6-13. The USA encompasses Weott's community center located just outside of Humboldt Redwoods State Park along U.S. Highway 101 and Avenue of the Giants. The Weott USA has 340 total acres, of which 31 acres are underdeveloped and/or vacant parcels. Of this total acreage, 26 acres within the USA are developable. With respect to development potential, the Weott USA contains mostly underdeveloped parcels in the community center area with some smaller vacant parcels that could experience residential development.

The area's land use guidelines and development potential are covered in the Avenue of the Giants Community Plan, which was last updated on April 11, 2000.

#### **6.4.17.3. Water System Service Area Description**

The Weott USA receives water service from Weott Community Services District (WCSD). The WCSD was originally organized in 1965 pursuant to the provisions of Title 6, Division 2 of the Government Code. The governing board of the District is the Board of Directors, elected by the citizens of the District. The term of office is four years. The District was formed for the purpose of providing water, sewer, and fire protection.

#### **System Standards**

WCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

According to WCSD records, they operate their water system on an annual budget of approximately \$65,000. The majority of this income is from service charges, but funding also

comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently do not have built up reserves.

### **Water Demand**

The WCSD produced approximately 47 million gallons of drinking water in 2005, according to the 2006 DHS annual inspection report. Average daily use is estimated at approximately 0.129 MGD. Peak daily use is misreported in the DHS report but is estimated at twice average daily use, or approximately 0.258 MGD. The District reported peak water usage at 0.127 MGD. The District has approximately 140 existing, unmetered service connections and does not retail water to any other Districts.

### **Water Supply, Treatment, Distribution and Storage**

WCSD's water system consists of two surface water sources located across the Eel River and south of Bull Creek. The springs located on Mill Creek are permitted to produce 80 gpm, and the springs located on Corner and Deck Creek are permitted to produce 60 gpm. The springs flow by gravity to two treatment trains – the Mill Creek springs provide water to Line A, while the other springs provide water to Line B. The total rated capacity of these sources is approximately 0.202 MGD.

The springs flow by gravity through two separate treatment and distribution systems – Line A and Line B. Line A has a treatment capacity of 37.7 gpm at the maximum allowable filter loading rate, and Line B has a treatment capacity of 47.7 gpm. Each treatment train has two pressure filters in series. Sodium hypochlorite is injected following filtration. Interties exist between the two systems within the distribution system. Treatment capacity totals approximately 85.4 gpm (0.113 MGD if operated 22 hours per day) and is therefore more limiting than source capacity.

The District operates two pressure zones, each served by separate storage and distribution systems. Water storage consists of two tanks: a 79,000 gallon concrete tank and a new 90,000 bolted steel tank. One booster station is in operation to boost Line A following filtration to storage. The distribution system consists of approximately 4 miles of PVC, steel, and aluminum pipe varying in size from 3 inches to 4 inches.

### **Condition Assessment**

**Overview.** Weott CSD's water system is in fair condition and has historically suffered supply problems during summer months. Estimated peak daily use is currently greater than available supply from the District's springs. The springs are located in a newly designated wilderness area of Humboldt Redwoods State Park, so the Park is developing a new well to replace the springs. To date, the well has not been placed on line due to high iron, manganese, and arsenic levels and increased treatment requirements. It is unclear at this time what the production capacity of the new well will be or whether an alternative well or source will be developed. Treatment capacity is currently severely undersized, approximately double the DHS mandated maximum filter loading rate.

Currently, overall peak daily use is in excess of the spring's source capacity and the treatment plant's treatment capacity. Peak daily demands are approximately 128% of existing source capacity and 210% of existing treatment capacity.

**Current Deficiencies.** The District suffers from historic supply problems during low flow summer months. The District exceeds recommended DHS filter loading rates by nearly double, and in

2005 filter performance standards were not met. The system also experiences turbidity problems during winter months. The distribution system is all four-inch diameter pipe or smaller. Although this meets Waterworks Standards for domestic use, these mains would be unable to provide sufficient fire flow as set forth by California Fire Code. The system is also unmetered.

**Underserved Areas.** The District currently serves all areas within its service boundaries.

### **Proposed Improvements**

**System Upgrades.** The District is planning to install meters on all service connections as time and funding permits, install additional filter capacity, replace some steel water mains, and replace springs within the next twenty years as the newly constructed Park Service well may not be adequate due to poor water quality.

**Future Expansion.** The District has no plans for expansion.

**Cost and Schedule of Improvements.** The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

## **6.4.18. Willow Creek USA & WSA**

The Willow Creek study area contains both a USA and WSA. The County estimates there were 20 and 1000 housing units within the Willow Creek USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Willow Creek USA could have between 22 and 33 total housing units by 2025, while the Willow Creek WSA could have between 1,105 and 1,639 total housing units by 2025. According to Table 1-6, the high build-out estimates for total development potential within the USA and WSA, which takes into consideration physical and zoning constraints, are 96 and 1,504, respectively. Therefore, although the growth projections for the WSA are within the range of what the land can bear, the high growth rate estimate for the USA is in excess of what the land can bear.

The high build-out estimates for total development potential of 96 and 1,504 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 580 new housing units within the Willow Creek USA and WSA.

### **6.4.18.1. Summary**

#### **Findings**

Willow Creek's water system has historically had problems but is in the process of a large-scale renovation. The community recently received grant and loan monies from Proposition 50 and the State Revolving Fund to complete a new water filtration plant and upgrade their water intake system. There are no major infrastructure deficiencies associated with the existing and new systems, although portions of the distribution system consist of 4-inch mains, which do not provide adequate fire flows. Additional storage capacity is also needed within the system.

Additionally, the Willow Creek USA and WSA are expected to receive up to 580 new housing units before reaching build-out conditions. Willow Creek will need to expand its water system infrastructure to serve this additional growth.

#### **Existing Capacity**

Availability of connections within the Willow Creek water system is currently limited by both its source and treatment capacity. However, treatment capacity is currently more limiting. Source

capacity is limited by the District's infiltration gallery and is estimated at 3.76 MGD if the pumps are operated 24 hours per day. The treatment capacity is limited by filtration and is estimated at 2.953 MGD if the filters are operated 23 hours per day (time allowed for backwash cycle). Given existing maximum day demands are 1.8 MGD, the system is operating at approximately 48% of source capacity and 70% of treatment capacity. Based on treatment capacity, there are 618 available connections under the existing infrastructure.

### Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Willow Creek USA/WSA and addresses infrastructure needs for existing development and for build-out conditions. There are several large development projects proposed in Willow Creek including the Walton subdivision and the Jurin Project which will account for approximately 150 new connections.

**Table 6-18. Water system infrastructure assessment for the Willow Creek USA and WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	967
# of Available Connections <sup>1</sup>	618
Source Capacity (MGD)	3.76
Storage Capacity (MG)	1.08
Treatment Capacity (MGD)	2.953
Peak Day Use (MGD)	1.8
Usage Rate (gpd/connection)	1,861
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.840 MG <sup>2</sup></i>	\$1,680,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$1,680,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$1,737</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$9.29</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	227
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.423 MG <sup>3</sup></i>	\$846,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$846,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$3,727</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$2,526,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$2,116</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$11.31</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	580
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 1.080 MG <sup>3</sup></i>	\$2,160,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$2,160,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$3,724</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$3,840,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$2,482</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$13.27</b>

NOTES: <sup>1</sup> The number of available connections in the Willow Creek study area was estimated based on the District currently being at 61% of its treatment capacity.

<sup>2</sup> Additional storage requirements are based on 1 day of maximum day use (1.8 MG) plus minimum fire storage of 120,000 gallons minus existing storage (1.08 MG).

<sup>3</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,861 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.68 million loan would amount to approximately \$108,000 per year. With 967 existing ratepayers, monthly bills would have to be increased by approximately \$9 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.4.18.2. Description of Urban Study Area**

A map showing the Willow Creek USA is attached as Figure 6-14. The USA encompasses Willow Creek's community center and is located approximately 50 miles northeast of Eureka in eastern Humboldt County at the junction of U.S. Highway 299 and U.S. Highway 96. The Willow Creek USA has 340 and the WSA 3,967 total acres, of which 52 acres and 1,454, respectively, are underdeveloped and/or vacant parcels. Of this total acreage, 25 acres within the USA, and 715 acres within the WSA, are developable. With respect to development potential, the Willow Creek USA and WSA contain both underdeveloped and vacant parcels that could experience further residential development.

The area's land use guidelines and development potential are covered in the Willow Creek Community Plan, which was last updated on June 27, 1986.

#### **6.4.18.3. Water System Service Area Description**

The Willow Creek USA and WSA receive water service from Willow Creek Community Services District (WCCSD). The Willow Creek Community Services District (CSD) was originally organized in 1965 under Government Code Section 61600. There are five members of the board who supervise the business of the District. The District was formed for the purpose of providing water, recreation, and street lighting, but is now in the process of developing wastewater services as well.

#### **System Standards**

WCCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

According to WCCSD records, they operate their water system on an annual budget of approximately \$475,000. The majority of this income is from service charges, but funding also

comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District's latest Capital Improvement Plan was developed in 2007, and they currently have approximately \$130,000 in reserves.

### **Water Demand**

The WCCSD produced approximately 244 million gallons of drinking water in 2003, according to the 2004 DHS annual inspection report. Average daily use is estimated at approximately 0.668 MGD, and peak daily use was reported as 1.80 MGD in 2004. The District has approximately 967 existing service connections and does not retail water to any other Districts.

### **Water Supply, Treatment, Distribution and Storage**

The District's source of supply is from Willow Creek. It consists of six wells located in the mouth of Willow Creek. Four wells draw water from infiltration galleries in the Willow Creek flood plain acting as a natural filtration system. These wells are believed to be under the influence of surface water. The District has two wells separate from the infiltration gallery, which may or may not be under the influence of surface water. The water is chlorinated and treated before it placed into the distribution system. The District monitors chlorination and turbidity 24 hours a day. Due to some of their sources being under the influence of surface water, the system was not in compliance with the SWTR until recent construction of a new water treatment plant. The new treatment plant was completed in 2007, and has a design capacity of 2,140 gpm. If run for 23 hours per day, treatment capacity is approximately 2.953 MGD. Total source capacity is 2,610 gpm, or 3.76 MGD.

The system has seven pressure zones, served by various storage tanks throughout the system. In total, the District has six storage tanks with a combined capacity of 1,080,000 gallons. Pump stations are located throughout the system in areas where facilities to be served are higher in elevation than primary tanks. The District maintains approximately 24 miles of main line consisting primarily of asbestos cement pipe with some PVC and ductile iron pipe. The distribution system ranges in size from 4 inch to 12 inch.

### **Condition Assessment**

**Overview.** Willow Creek CSD's water system is generally in good condition, although per capita demand is very high (1861 gpd/cap) and may be the result of system leaks. The District recently constructed a new water treatment plant to bring the system into compliance with SWTR. Current peak water use is approximately 48% of available production capacity. The new water treatment plant has been designed for 2,140 gpm, approximately 40% greater than existing peak day demands.

**Current Deficiencies.** The District does not have adequate storage capacity to even provide one day of supply at maximum day demand. Generally, two to three days minimum is recommended. It is unclear if the high per capita demands are due to system leaks or agricultural users. A computer model of the water system would be helpful in making future decisions regarding infrastructure upgrades. The existing surface water source is downstream of the town center's main stormwater discharge point that contains potential contaminating activities. The District is investigating State Revolving Fund projects to address this issue.

**Underserved Areas.** The District currently serves all areas within its service boundaries. In the Patterson Road corridor near Willow Creek Country Club, there are several areas of service and storage needs. Winnett Vineyard, including the McMurray and Aronson properties, is in need of a storage tank with sufficient elevation for fire and power outage protection. The Gypo Hill

properties above the Early Bird Drive Inn are served by an inadequate, privately owned pressure station. The Triple R Ranch is serviced by a 2 inch line, which is considered severely undersized.

### **Proposed Improvements**

**System Upgrades.** The District's main improvement involves construction of a new 400,000 gallon storage tank above the new treatment plant and Brannan Mountain Road. The tank is needed to comply with chlorine contact time requirements and will also create a looped system to the Highway 96 corridor. The District is also planning to replace some older redwood storage tanks within the next ten to twenty years. A new pump station is planned to serve the Gypo Hill properties. The Hodgson Subdivision and the Terrace Subdivision both have water infrastructure that predates the District. These areas are in need of new distribution and storage facilities.

**Future Expansion.** When the Walton subdivision is developed, there will be need for at least a 100,000 gallon water tank to serve this 67 acre development.

**Cost and Schedule of Improvements.** The District's latest Capital Improvement Goals for 2007 include installation of VFD on the pump motors, new storage and controls for tanks, and improvements to the District's buildings. Total costs are estimated at approximately \$77,000.

## **6.5. Water Study Areas**

Water study areas (WSAs) are regions within the County where water service exists or may be feasible to provide, and planned densities less than one unit per acre are appropriate to consider. As with urban study areas, the County's purpose in defining water study areas is to identify areas for more detailed planning and analysis, mainly with respect to development capacity and the infrastructure required to service both existing and any further development that may occur within these areas. Identification of the study areas and correspondence and dialogue with service providers within these areas will give the County valuable information regarding development potential and allow for more informed development timing policies within the County.

The following sections introduce the County's water study areas and provide a detailed discussion on development potential and water infrastructure assessment for each study area. Any water system infrastructure deficiencies will be identified along with plans for timing and financing of needed improvements. See section 6.4 Urban Study Areas for a detailed description of the assumptions used in the analysis of existing and future capabilities of water providers.

### **6.5.1. Alderpoint WSA**

The County estimates there were 66 housing units within the Alderpoint WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Alderpoint WSA could have between 73 and 108 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 132. Therefore, the high rate growth projection for the study area is in excess of what the land can bear.

The high build-out estimate for total development potential of 132 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 66 new housing units within the Alderpoint WSA.

### **6.5.1.1. Summary**

#### **Findings**

Alderpoint's water system is in poor condition. The system has only chlorination and no form of treatment and is therefore not in compliance with SWTR. The District has been issued a compliance order by the EPA, and is in the process of seeking funding sources for a new treatment system. Alderpoint's distribution system also contains pipe smaller than 6 inches in diameter, which does not provide sufficient fire flows as set forth by California Fire Code standards. Additional storage capacity is needed, as existing storage does not even provide the minimum recommended fire flows. The system also lacks certified operators.

The Alderpoint WSA could receive up to 66 new housing units before reaching build-out conditions. Alderpoint will need to expand its water system infrastructure to serve this additional growth.

#### **Existing Capacity**

Availability of connections within the Alderpoint water system is mostly limited by its lack of treatment. Source capacity is limited by the District's infiltration gallery and is estimated at 0.432 MGD if the pumps are operated 24 hours per day. The system is not in compliance with SWTR due to lack of treatment. Therefore, there are no available connections under the existing infrastructure.

#### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Alderpoint WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-19. Water system infrastructure assessment for the Alderpoint WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	74
# of Available Connections <sup>1</sup>	0
Source Capacity (MGD)	0.432
Storage Capacity (MG)	0.105
Treatment Capacity (MGD)	0
Peak Day Use (MGD)	0.080
Usage Rate (gpd/connection)	1,081
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.095 MGD <sup>2</sup></i>	\$190,000
<i>Conventional treatment capacity – 0.08 MGD <sup>3</sup></i>	\$400,000
<i>Replace distribution piping – 2.5 miles <sup>4</sup></i>	\$1,320,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$1,910,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$25,811</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$137.97</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	44
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.048 MGD <sup>5</sup></i>	\$96,000
<i>Conventional treatment capacity – 0.048 MGD <sup>3</sup></i>	\$240,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$336,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$7,636</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$2,246,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$19,034</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$101.75</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	66
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.071 MGD <sup>5</sup></i>	\$142,000
<i>Conventional treatment capacity – 0.071 MGD <sup>3</sup></i>	\$355,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$497,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$7,530</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$2,407,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$17,193</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$91.91</b>

NOTES: <sup>1</sup> The number of available connections in the Alderpoint WSA was set at zero due to lack of treatment. A new water treatment facility is being planned.

<sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.08 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.105 MG).

<sup>3</sup> A new treatment facility is needed to meet existing maximum day demands of 0.08 MGD and future maximum day demands of 0.128 MGD under low build-out and 0.151 MGD under high build-out conditions.

<sup>4</sup> According to the DHS annual inspection report, the District's 2.5 miles of distribution piping are all in fair condition and will likely need replacement within the planning time frame of this document. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

<sup>5</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,081gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.91 million loan would amount to approximately \$123,000 per year. With 74 existing ratepayers, monthly bills would have to be increased by approximately \$138 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.5.1.2. Description of Water Study Area**

A map showing the Alderpoint WSA is attached as Figure 6-15. The WSA encompasses Alderpoint's community center, located approximately 20 miles northeast of Garberville along the Middle Fork of the Eel River. The Alderpoint WSA has 370 total acres, of which 210 acres are underdeveloped and/or vacant parcels. Of this total acreage, 130 acres within the WSA are developable. With respect to development potential, the Alderpoint WSA contains mostly vacant parcels with some underdeveloped parcels that could see further residential development.

The area's land use guidelines and development potential are covered in the Garberville, Redway, Benbow, and Alderpoint Community Plan, which was last updated on November 30, 2004.

#### **6.5.1.3. Water System Service Area Description**

The Alderpoint WSA receives water service from Alderpoint County Water District (ACWD). The ACWD was originally established in 1965 with the purpose of providing water services to the surrounding community. Alderpoint CWD is governed by a five member Board of Directors that is responsible for the business of the District. The members of the Board of Directors serve staggered four year terms of office. The District was formed for the purpose of providing water services.

#### **System Standards**

ACWD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

According to ACWD records, they operate their water system on an annual budget of approximately \$35,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not

developed a Capital Improvement Plan to date, and they currently do not have built up reserves.

### **Water Demand**

The ACWD produced approximately 14 million gallons of drinking water in 2005, according to the 2007 DHS annual inspection report. Average daily use is estimated at 0.039 MGD, and peak daily use was reported as approximately 0.080 MGD in 2005. The District has approximately 74 existing service connections and does not retail water to any other Districts. Currently, the District provides service to approximately 81% of households within the District.

### **Water Supply, Treatment, Distribution and Storage**

The source of water for the District is an infiltration gallery in the Eel River bed with a rated capacity of 300 gpm, or 0.432 MGD. The infiltration gallery collection pipe is approximately nine feet below the bed of the river. From the infiltration gallery wet well, water is pumped through about 600 feet of six-inch cast iron main to a 5,000-gallon staging tank located 130 feet above the riverbed. The 5,000-gallon tank and its accompanying pump house are located just off River Road. Calcium hypochlorite, a disinfectant, is added to the water in the 5,000-gallon tank. No filtration process is currently employed.

From the 5,000-gallon staging/preliminary distribution tank, water is pumped up another 300-feet, via approximately 500 feet of six inch main, to a 100,000-gallon redwood storage tank. This main storage tank feeds water into the distribution system. The distribution system also has a booster pump station that serves a couple houses.

Water is distributed directly to several households along River Road north and south of the 5,000-gallon tank from the line to the 100,000-gallon tank. The main distribution system contains approximately 2.5 miles of mainline varying in size from two-inch to six-inch in diameter. The distribution piping is either AC or PVC.

According to a Water System Feasibility Study completed for Alderpoint, supply capacity is the range of 216,000 to 320,000 gallons per day, which is well in excess of the current demands and production. ACWD is planning to install new pumps, which would provide about 200 gallons per minute (gpm) or 288,000 gallons per day (gpd) (Oscar Larson & Associates, 2003).

### **Condition Assessment**

**Overview.** ACWD's water system is not currently operating satisfactorily, according to DHS inspection reports. Source capacity is more than sufficient, as current peak daily use is approximately 19% of existing source capacity. However, the District has no filtration and is therefore not in compliance with SWTR.

**Current Deficiencies.** The District has been out of compliance with the SWTR since 1986. The Environmental Protection Agency issued a compliance order in 1992. A feasibility study for a facility upgrade was completed in 1993. The Board of Directors decided not to take action at the time. In 2003, a revised feasibility study was completed. A representative from the California Rural Water Association is completing an application to be submitted to the State Revolving Fund for funding. The State has decided to fund the project for design and construction. A new membrane filtration system will likely be installed, and the estimated cost of the water facility was approximately \$433,000 in 2003 dollars.

According to a DHS inspection report from May 2007, the District needs to perform the following:

- The District does not have a licensed operator and is in need of at least a Grade T2/D1 WTO/WDO.
- Maintain at least a 0.7 ppm chlorine residual to achieve adequate disinfection for connections past Main Tank.
- Continue Boil Water Advisory to all service connections located prior to the Main Tank due to inadequate chlorine contact time.
- Comply with Distribution Monitoring Schedule and current WQI3 Eel River untreated water Chemical Monitoring Schedule.
- Adopt a Cross-Connection Control Policy or Ordinance and complete a Cross-Connection Hazard Survey and Assessment.
- Perform repairs to both tanks.
- Obtain compliance with Surface Water Treatment Regulations.

**Underserved Areas.** The District currently serves all areas within its service boundaries.

### **Proposed Improvements**

**System Upgrades.** The District has plans to repair their storage tanks and has been in contact with Western Wood Tank. Efforts will also need to be made to address losses within the distribution system.

The District is in the process of trying to obtain SRF loans and/or Proposition 50 funds to install a filtration system that will bring the District into compliance with SWTR. A membrane filtration facility has been proposed to be located across River Road and immediately west of the existing 5,000-gallon storage/booster tank. This positioning will allow the existing tank, pumps, and delivery system to remain in place with minimal system modifications. It is assumed that the proposed water treatment upgrade will meet all current regulations.

**Future Expansion.** The District does not have plans for expansion.

**Cost and Schedule of Improvements.** The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

## **6.5.2. Benbow WSA**

The County estimates there were 114 housing units within the Benbow WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Benbow WSA could have between 126 and 187 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 170. Therefore, the high rate growth projection for the study area is in excess of what the land can bear.

The high build-out estimate for total development potential of 170 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 56 new housing units within the Benbow WSA.

### **6.5.2.1. Summary**

#### **Findings**

Benbow's water system is in fair condition. Major deficiencies include undersized pumping capacity and undersized treatment capacity. Portions of the distribution system are asbestos cement pipe nearing 50 years old and will likely require replacement within the next twenty

years. Benbow's distribution system also contains pipe smaller than 6 inches in diameter, which does not provide sufficient fire flows as set forth by California Fire Code standards.

The Benbow WSA could receive up to 56 new housing units before reaching build-out conditions. Benbow will need to expand its water system infrastructure to serve this additional growth.

### **Existing Capacity**

Availability of connections within the Benbow water system is currently limited by both its source and treatment capacity. However, treatment capacity is currently more limiting. Source capacity is limited by the District's infiltration gallery and is estimated at 0.327 MGD if the pumps are operated 24 hours per day. The treatment capacity is limited by filtration and is estimated at approximately 0.2 MGD. Given existing maximum day demands are 0.382 MGD, the system is operating well in excess of both source and treatment capacity. Therefore, there are no available connections under the existing infrastructure.

### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Benbow WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-20. Water system infrastructure assessment for the Benbow WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	113
# of Available Connections <sup>1</sup>	0
Source Capacity (MGD)	0.327
Storage Capacity (MG)	0.15
Treatment Capacity (MGD)	0.2
Peak Day Use (MGD)	0.382
Usage Rate (gpd/connection)	3,381
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.352 MG <sup>2</sup></i>	\$704,000
<i>Additional source capacity – infiltration system upgrades <sup>3</sup></i>	\$200,000
<i>Conventional treatment capacity – 0.182 MGD <sup>4</sup></i>	\$910,000
<i>Replace distribution piping – 3 miles <sup>5</sup></i>	\$1,584,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$3,398,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$30,071</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$160.75</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	55
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.186 MG <sup>6</sup></i>	\$372,000
<i>Conventional treatment capacity – 0.186 MGD <sup>4</sup></i>	\$930,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$1,302,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$23,673</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$4,700,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$27,976</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$149.55</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	56
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.189 MG <sup>6</sup></i>	\$378,000
<i>Conventional treatment capacity – 0.189 MGD <sup>4</sup></i>	\$945,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$1,323,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$23,625</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$4,721,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$27,935</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$149.33</b>

NOTES: <sup>1</sup> The number of available connections in the Benbow WSA was set at zero due to undersized treatment capacity.

<sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.382 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.15 MG).

<sup>3</sup> Existing source capacity is insufficient to meet existing or future maximum day demands.

<sup>4</sup> The existing treatment facility needs to be expanded to meet existing maximum day demands of 0.382 MGD and future maximum day demands of 0.568 MGD under low build-out and 0.571 MGD under high build-out.

<sup>5</sup> According to the DHS annual inspection report, approximately 65% of the distribution system is AC main originally installed in 1962 and probably warrants replacement within the planning time frame. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

<sup>6</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 3,381 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$3.398 million loan would amount to approximately \$218,000 per year. With 113 existing ratepayers, monthly bills would have to be increased by approximately \$161 per month to fund this loan. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

The BWC is not a local government agency and is therefore not eligible for most local, state, and federal grant sources. The BWC would need to secure funding through company assets or loans to make improvements. The BWC is eligible to petition the CPUC to seek a water rate increase to recover the full cost of the improvements plus a set rate of return on investment.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.5.2.2. Description of Water Study Area**

A map showing the Benbow WSA is attached as Figure 6-4. The WSA encompasses Benbow's community center, located just south of Garberville along the South Fork of the Eel River. The Benbow WSA has 415 total acres, of which 103 acres are underdeveloped and/or vacant parcels. Of this total acreage, 51 acres within the WSA are developable. With respect to development potential, the Benbow WSA contains mostly vacant parcels with some underdeveloped parcels that could see further residential development.

The area's land use guidelines and development potential are covered in the Garberville, Redway, Benbow, and Alderpoint Community Plan, which was last updated on November 30, 2004.

#### **6.5.2.3. Water System Service Area Description**

The Benbow WSA receives water service from the Benbow Water Company (BWC), a private water company. The BWC was originally established in 1965 and was formed for the purpose of providing water services.

#### **System Standards**

BWC's water system is a private water system. However, public water system standards apply to private water systems that serve over 25 people for more than 60 days per year. Therefore, the BWC's water system must be operated to meet the requirements of the State of California. The BWC is also a regulated public utility and subject to the requirements of the CPUC. See Section 6.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

The BWC operating budget is unknown. The BWC has not developed a Capital Improvement Plan to date, and they currently do not have built up reserves.

## Water Demand

The BWC produced approximately 31 million gallons of drinking water in 2005, according to the 2006 DHS annual inspection report. Average daily use is estimated at 0.085 MGD, and peak daily use was reported as 0.382 MGD. The BWC has approximately 113 existing service connections, of which 101 are residential connections, and does not retail water to any other Districts.

## Water Supply, Treatment, Distribution and Storage

BWC receives its water supply from an infiltration gallery located in the East Branch South Fork of the Eel River. The gallery feeds into a wet well, which houses production pumps with a rated capacity of 0.327 MGD. Water is chlorinated within the wet well using a tablet feeder with a variable water flow running through it based on the production pump output. Water is pumped to a treatment plant where a cationic polymer is fed inline. Coagulation occurs within a 700 gallon coarse sand contact clarifier. The flow then splits and runs through two parallel 700 gallon dual-media pressure filters. The treatment system is severely undersized, and is routinely operating at nearly double the DHS's maximum filter loading rate.

BWC's distribution system consists of three pressure zones serviced by four individual tanks ranging in size between 5,000 gallons and 135,000 gallons. Total storage capacity is 150,000 gallons. Storage capacity per zone is dependent on the number of connections served. All zones are fed by gravity. The distribution system consists of approximately five miles of water mains consisting of 4-inch and 6-inch AC pipe and 8-inch and smaller PVC pipe. The original distribution system was installed by the State in 1962.

## Condition Assessment

**Overview.** BWC's water system is in fair condition and is not currently meeting source capacity standards. Although the actual source capacity is more than adequate, the BWC is currently limited by their pumping capacity. The current pumping capacity of 0.327 MGD is not sufficient to meet current peak day demands of 0.382 MGD. Treatment capacity is also undersized.

**Current Deficiencies.** Source capacity is a serious problem. Pumping capacity is less than maximum day capacity, and at maximum pumping rates the filters are loaded at nearly double the allowed filter loading rate. The BWC is currently not meeting the requirements of Section 64562 of the regulations which mandates that total available source capacity shall not be less than the needed source capacity. The DHS has asked the BWC to develop a plan to correct the source capacity and filter loading rate issues.

The DHS inspection report from May 2006 did not find any other serious deficiencies aside from regular bacteriological and chemical monitoring that needs to be done.

**Underserved Areas.** The BWC currently serves all areas within its service boundaries.

## Proposed Improvements

**System Upgrades.** The BWC is currently looking into increasing their permitted water rights and upgrading their pumps to increase source capacity. They have no other plans for significant improvements over the next 20 years, aside from growth related replacement of treatment works and maintenance. If significant growth occurs, an expansion to the existing treatment plant will be needed.

**Future Expansion.** The BWC does not have plans for expansion.

**Cost and Schedule of Improvements.** The BWC has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system. However, they have estimated that an expansion to the existing treatment plant would cost approximately \$300,000.

### **6.5.3. Big Lagoon WSA**

The County estimates there were 170 housing units within the Big Lagoon WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Big Lagoon WSA could have between 188 and 279 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 184. Therefore, both the low and high rate growth projections for the study area are in excess of what the land can bear.

The high build-out estimate for total development potential of 184 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 14 new housing units within the Big Lagoon WSA.

#### **6.5.3.1. Summary**

##### **Findings**

Big Lagoon's water system is in good condition. No major deficiencies exist with the system, aside from the storage capacity being undersized and the need to relocate a water main due to bluff erosion. Existing storage capacity is inadequate for fire suppression. The Big Lagoon WSA could receive up to 14 new housing units before reaching build-out conditions. Big Lagoon will need to expand its water system infrastructure to serve this additional growth.

##### **Existing Capacity**

Availability of connections within the Big Lagoon water system is currently limited by the source capacity of its wells. Well production is estimated at 0.07 MGD over a 24 hour period. Given existing maximum day demands are estimated at 0.012 MGD, the system is operating at approximately 17% of source capacity. Therefore, there are approximately 166 available connections under the existing infrastructure.

##### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Big Lagoon WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-21. Water system infrastructure assessment for the Big Lagoon WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	34
# of Available Connections <sup>1</sup>	166
Source Capacity (MGD)	0.070
Storage Capacity (MG)	0.023
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.012
Usage Rate (gpd/connection)	343
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.109 MG <sup>2</sup></i>	\$218,000
<i>Relocate distribution piping – 3,000 feet <sup>3</sup></i>	\$300,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$518,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$15,235</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$81.44</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	10
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 3,500 gal. <sup>4</sup></i>	\$7,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$7,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$700</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$525,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$11,932</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$63.78</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	14
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 5,000 gal. <sup>4</sup></i>	\$10,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$10,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$714</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$528,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$11,000</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$58.80</b>

NOTES: <sup>1</sup> The number of available connections in the Big Lagoon study area was estimated based on the District currently being at 17% of its source capacity.

<sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.012 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.023 MG).

<sup>3</sup> Estimated length of pipeline in coastal bluff zone that needs replacing.

<sup>4</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 343 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$518,000 loan would amount to approximately \$33,000 per year. With 34 existing ratepayers, monthly bills would have to be increased by approximately \$81 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing

deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

### **6.5.3.2. Description of Water Study Area**

A map showing the Big Lagoon WSA is attached as Figure 6-16. The WSA encompasses the Big Lagoon residential area, located in northern Humboldt County on the coast just north of Trinidad, CA. The Big Lagoon WSA has 159 total acres, of which 63 acres are underdeveloped and/or vacant parcels. Of this total acreage, 53 acres within the WSA are developable. With respect to development potential, the Big Lagoon WSA contains mostly vacant parcels with some underdeveloped parcels that could see further residential development. Big Lagoon is located within the Coastal Zone, and land use guidelines and development potential are addressed in the North Coastal Area Plan.

### **6.5.3.3. Water System Service Area Description**

The Big Lagoon WSA receives water service from Big Lagoon Community Services District (BLCSD). The BLCSD was formed on July 1, 1998 under Community Services District law pursuant to sections 61000-61934 of the Government Code. The governing board is elected and consists of a five (5) member Board of Directors to supervise the business of the District. The District was formed for the purposes of supplying water to houses in the Big Lagoon subdivision and Big Lagoon School. It is important to note that the District was formed conditional upon a Local Coastal Plan amendment to expand the Urban Limit Line to include all properties within the District.

The District originally provided water service to 40 households and Big Lagoon School. The system now serves 34 homes following an El Nino event in 1998, in which several homes were lost due to a coastal bluff failure. Because the County has had to purchase a number of lots in the area of coastal bluff failure, there are only 13 additional vacant lots that could potentially request service.

### **System Standards**

BLCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

### **Fiscal Condition/Capital Replacement Program**

According to BLCSD records, they operate their water system on an annual budget of approximately \$23,000. The majority of this income is from service charges interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently do not have built up reserves.

## Water Demand

The BLCSD produces approximately 1.7 million gallons of drinking water in 2005, according to the 2007 DHS annual inspection report. Average daily use is estimated at approximately 4,650 gpd, and peak daily use was reported as 11,650 gpd. The District has approximately 34 existing service connections and does not retail water to any other Districts.

## Water Supply, Treatment, Distribution and Storage

The Big Lagoon CSD manages a water system that was installed for the Big Lagoon subdivision in 1962. The Big Lagoon CSD acquired the water system from a private owner in 1999. The water system now consists of 2 wells, a 20,000 gallon redwood storage tank, a 15 horsepower booster pump and a 3,000 gallon hydropneumatic tank with an air compressor. Chlorine is added continuously through a positive displacement diaphragm feeder. Supply issues have never been a problem, even in the driest of years. The maximum system delivery output totals approximately 70,000 gallons per day, well in excess of current maximum demands. The District's distribution system consists of approximately 1.6 miles of six-inch asbestos cement pipe.

## Condition Assessment

**Overview.** BLCSD's water system is operating in good condition and is in need of only minor repairs. Current peak water use is at approximately 17% of available production capacity.

**Current Deficiencies.** According to the 2007 DHS inspection report, the water system needs to perform the following:

- Install a check valve on the hydropneumatic tank well discharge and the yard well discharge line.
- Install new roof on redwood tank.
- Recoat interior and paint exterior of hydropneumatic tank.
- Repaint exterior of both pumps.
- Develop a cross-connection ordinance.
- Perform well source chemical tests and perform raw water testing for nitrate and Radium-288.

**Underserved Areas.** The District currently serves all areas within its service boundaries.

## Proposed Improvements

**System Upgrades.** Aside from the above items requested by the DHS, the District also plans to immediately relocate water mains along North Oceanview Drive that are located in eroding coastal bluffs.

**Future Expansion.** The District does not have plans for expansion.

**Cost and Schedule of Improvements.** The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

### 6.5.4. Briceland WSA

The County estimates there were 36 housing units within the Briceland WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Briceland WSA could have between 40 and 59 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical

and zoning constraints, is 62. Therefore, both the low and high rate growth projections for the study area are within the range of what the land can bear.

The high build-out estimate for total development potential of 62 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 26 new housing units within the Briceland WSA.

#### **6.5.4.1. Summary**

##### **Findings**

Briceland's water system is in poor condition. Several deficiencies exist with the existing system. Source capacity is unable to meet current maximum day demands, the treatment system is unable to meet turbidity performance standards during winter months, and storage capacity is barely able to meet even one day of maximum day demands. Recommended fire suppression storage is not available. Briceland is currently under a moratorium for new connections.

However, the Briceland WSA could receive up to 26 new housing units before reaching build-out conditions. Briceland will need to find a new source of water and expand its water system infrastructure to serve this additional growth.

##### **Existing Capacity**

Availability of connections within the Briceland water system is currently limited by the source capacity of its springs. Spring production, during critical periods, is estimated at 10,080 gpd over a 24 hour period. Given existing maximum day demands are estimated at 40,000 gpd, the system is operating at approximately 397% of source capacity. Therefore, there are no available connections under the existing infrastructure.

##### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Briceland WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-22. Water system infrastructure assessment for the Briceland WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	26
# of Available Connections <sup>1</sup>	0
Source Capacity (gpd)	10,080
Storage Capacity (gal)	42,000
Treatment Capacity (MGD)	Unknown but not limiting
Peak Day Use (gpd)	40,000
Usage Rate (gpd/connection)	1,538
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.118 MG <sup>2</sup></i>	\$236,000
<i>Additional source capacity – new well</i>	\$50,000
<i>Install roughing filters – 42,000 gpd <sup>3</sup></i>	\$210,000
<i>Replace distribution piping – 0.75 miles <sup>4</sup></i>	\$396,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$892,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$34,308</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$183.39</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	13
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.02MG <sup>5</sup></i>	\$40,000
<i>Additional roughing filter capacity – 20,000 gpd <sup>3</sup></i>	\$100,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$140,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$10,769</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$1,032,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$26,462</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$141.45</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	26
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.04 MG <sup>5</sup></i>	\$80,000
<i>Additional roughing filter capacity – 40,000 gpd <sup>3</sup></i>	\$200,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$280,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$10,769</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$1,172,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$22,538</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$120.48</b>

NOTES: <sup>1</sup> The number of available connections in the Briceland WSA was set at zero due to undersized source capacity.

<sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.04 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.042 MG).

<sup>3</sup> Additional filtration capacity is needed in addition to the slow sand filters to meet turbidity standards for existing and future conditions. Future maximum day demands are estimated at 0.06 MGD for low build-out and 0.08 MGD for high build-out.

<sup>4</sup> According to the DHS annual inspection report, sizes, composition, and condition of distribution piping is unknown. This piping is assumed to need replacement over the planning time frame of this document. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

<sup>5</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,538 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$892,000 loan would amount to approximately \$75,000 per year. With 26 existing ratepayers, monthly bills would have to be increased by \$183 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.5.4.2. Description of Water Study Area**

A map showing the Briceland WSA is attached as Figure 6-17. The WSA encompasses the community of Briceland, located in a remote area of southern Humboldt County between Redway and Shelter Cove. The Briceland WSA has 82 total acres, of which 53 acres are underdeveloped and/or vacant parcels. All 53 acres within the WSA are developable. With respect to development potential, the Briceland WSA contains both vacant and underdeveloped parcels that could see further residential development. However, the CSD currently has placed a moratorium on new water connections due to limited water supply.

The area's land use guidelines and development potential are covered in the Humboldt County General Plan, where Briceland is identified as a Rural Community Center.

#### **6.5.4.3. Water System Service Area Description**

The Briceland WSA receives water service from the Briceland Community Services District (BCSD). The BCSD was formed on September 20, 1989 under Community Services District law pursuant to sections 61000-61934 of the Government Code. The governing board is elected and consists of a five (5) member Board of Directors to supervise the business of the District. The District was formed for the purposes of improving the water system that was supplying water to houses in the Briceland area. The water system that was in place at the time was an antiquated system put in by the original settlers in the 1880's.

#### **System Standards**

BCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

According to BCSD records, they operate their water system on an annual budget of approximately \$6,000. The majority of this income is from service charges, but funding also comes from interest revenue. Replacement or depreciation funds are not accumulated through

revenues. The District has not developed a Capital Improvement Plan to date, and they currently have approximately \$20,000 in reserves.

### **Water Demand**

According to the 2006 DHS inspection report, the BCSD produced approximately 3.88 million gallons of drinking water in 2005. Average daily use is estimated at 10,630 gpd, and peak daily use was reported as 40,000 gpd. The District has approximately 26 existing service connections and does not retail water to any other Districts.

### **Water Supply, Treatment, Distribution and Storage**

The sole water source for the District is a spring on private property. The District, through agreement with the owner and formal deeding, receives 90% of the spring's flow. The spring's flow is variable and dependent on rainfall. However, in the summertime, the spring outputs 5 – 7 gpm, or between 7,200 and 10,080 gpd.

Water from the spring passes through two slow sand filter bays with an intermediate settling basin. Filter loading rates are well below SWTR requirements for slow sand filters. The distribution system consists of two pressure zones that are supplied from a single 42,000 gallon concrete storage tank. Approximately 1,600 feet of AC pipe connect the storage tank to the distribution system. Another 2,300 feet of pipeline of unknown size and composition are within the housing area.

### **Condition Assessment**

**Overview.** BCSD's water system is operating in marginal condition and currently does not have the source capacity to meet current maximum day demands. Moreover, existing storage capacity provides about one day of storage at peak water demand rates. Existing peak daily use is approximately 400% of available source capacity during dry periods.

Source capacity is a significant problem, but the system has no other options for additional sources of water. Therefore, the District carefully watches storage tank levels during summer months. The District should promote conservation measures, as the current peak water usage of 40,000 gpd is excessive. For a population of 75 people, this represents a water usage of over 533 gallons per capita per day, which is extremely high. Whether the high usage is due to leakage or actual usage is unknown.

According to the 2007 DHS inspection report, the water system received the following appraisal:

- Turbidity performance standards were not met the previous four winters.
- A distribution system pipeline data sheet is required.
- Routine water system monitoring for GM, nitrate, radon, Ra-228, and VOCs is required.
- The District needs to adopt a cross-control ordinance.

The District has since completed its routine water system monitoring and has adopted a cross-control ordinance.

**Current Deficiencies.** The District experiences limited source capacity, which is currently less than reported average day demands. The spring is capable of producing approximately 100 gallons per capita per day. Efforts should be made to promote conservation and maintain water usage at this available rate.

**Underserved Areas.** The District currently has a moratorium on new connections. There are currently at least 4 homes within the District that have requested service connections; the oldest application is approximately 16 years old.

### **Proposed Improvements**

**System Upgrades.** The Briceland CSD anticipates installing a new roughing filter and a solar powered hypo chlorination unit in the near future.

**Future Expansion.** The Briceland Community services District is focused on maintaining service to existing customers and has no expansion plans at this time. The District currently is under moratorium on new service connections by ordinance, due to water shortages and statutory constraints. There are currently negotiations in place to develop a mutual aid agreement with a number of local CSD's in the vicinity.

**Cost and Schedule of Improvements.** The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

### **6.5.5. Fieldbrook WSA**

The Fieldbrook WSA receives water service from the Fieldbrook Glendale CSD (FGCSD), who also serves the Glendale USA and WSA. The Glendale USA and WSA are discussed previously in Section 6.4.5.

The County estimates there were 553 housing units within the Fieldbrook WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Fieldbrook WSA could have between 611 and 906 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the Fieldbrook WSA, which takes into consideration physical and zoning constraints, is 1,128. Therefore, the growth rate projections for the Fieldbrook WSA are within the range of what the land can bear.

The high build-out estimate for total development potential of 1,128 housing units in the WSA was used for infrastructure assessment and recommendations. This represents a combined 575 new housing units within the Fieldbrook WSA.

#### **6.5.5.1. Summary**

##### **Findings**

Fieldbrook's water system, owned and operated by FGCSD, is in good condition overall. The only major deficiency associated with the existing system and the existing development they serve is lower than desirable water pressure within some localized areas. In addition, a stand by generator is needed at the main (Lyman Rd) booster pump station and a new roof is needed on the redwood tank. The Fieldbrook WSA could receive up to 575 new housing units before reaching build-out conditions. The FGCSD will need to expand its water system infrastructure to serve this additional growth.

##### **Existing Capacity**

Availability of connections within the FGCSD water system is not limited by either source or treatment capacity. HBMWD has sufficient water supply to meet City demands.

##### **Summary of Required Improvements**

The infrastructure assessment for the Fieldbrook WSA was included in a comprehensive analysis of all study areas served by FGCSD (Fieldbrook WSA and Glendale USA and WSA). Due to the

interconnectedness of the water system, the study areas could not be assessed individually and were instead assessed as a whole. Section 6.4.5 contains the table that addresses the District's needs for existing development and for build-out conditions.

### **6.5.5.2. Description of Water Study Area**

A map showing the Fieldbrook WSA is attached as Figure 6-2. The WSA encompasses the community of Fieldbrook, located north of Humboldt Bay in mid Humboldt County approximately five miles from the coast. The Fieldbrook WSA is part of a larger planning area that encompasses both the Fieldbrook and Glendale sub-areas. The Fieldbrook WSA has 6,879 total acres, of which 5,138 acres are underdeveloped and/or vacant parcels. Of this total acreage, 3,755 acres within the WSA are developable. With respect to development potential, the Fieldbrook WSA contains mostly underdeveloped parcels with some vacant parcels that could see further residential development.

The area's land use guidelines and development potential are covered in the Fieldbrook Glendale Community Plan, which was recently updated in May 2006. Although the Fieldbrook Glendale Community Plan is not official due to lack of community planning authority, the Plan is to be included in this Humboldt County General Plan Update.

### **6.5.5.3. Water System**

#### **Service Area Description**

The Fieldbrook WSA receives water service mainly from the Fieldbrook Glendale Community Services District (FGCSD), although portions of the study area rely on private wells, springs, or surface water intakes, which can be of poor quantity and/or quality. The FGCSD was formed in 1973 under Community Services District law pursuant to sections 61000-61934 of the Government Code. The governing board is elected and consists of a five (5) member Board of Directors to supervise the business of the District.

#### **System Standards**

FGCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

According to FGCSD records, they operate their water system on an annual budget of approximately \$250,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District does not currently have a Capital Improvement Plan, and they currently have approximately \$0.5 million in water and wastewater reserves.

#### **Water Demand**

According to 2005/2006 HBMWD records, FGCSD's average daily use was 0.166 MGD and peak daily use was 0.389 MGD. The FGCSD retailed approximately 64 million gallons of drinking water in fiscal year 2005/2006. The Fieldbrook WSA has approximately 528 existing connections.

#### **Water Supply, Treatment, Distribution and Storage**

FGCSD purchases treated water from Humboldt Bay Municipal Water District (HBMWD) for delivery to its customers. HBMWD also provides operation, maintenance and administrative

support to FGCS D. FGCS D's water system begins at a water meter just north of the intersection of Fieldbrook Road and Glendale Drive. The system contains more than 10 miles of water mains, two booster pump stations, and one 400,000 redwood and one 20,000 gallon concrete water tank. Water quality is representative of HBMWD's excellent water source and meets or exceeds State standards.

### **Condition Assessment**

**Overview.** Water service within the Fieldbrook WSA is generally very good with the exception of some low pressure areas. Peak daily use of HBMWD water for the District (0.389 MGD in 2005/2006) is currently about 90% of their peak rate allocation of 0.43 MGD set in contract with HBMWD on July 1, 2006.

**Current Deficiencies.** Some localized low pressure areas exist within the service area; therefore, additional pressure is needed especially before any additional growth occurs. Emergency backup power is needed at the Lyman Road Pump Station and a new roof is needed on the redwood tank.

**Underserved Areas.** The FGCS D serves all areas within its service boundaries.

### **Proposed Improvements**

**System Upgrades.** The District's main problem involves low water pressure within certain regions of its service area. The District's long range plans for improvements include:

- Construction of a new booster pump station at Korplex to improve water pressure within the service area.
- Installation of a standby emergency generator at the Lyman Road Pump Station
- Construction of an additional reservoir.
- Install a new roof on the existing redwood tank.

**Future Expansion.** The District is interested in expanding services to new developments as they occur within the study area.

**Cost and Schedule of Improvements.** The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

### **6.5.6. Jacoby Creek WSA**

The County estimates there were 316 housing units within the Jacoby Creek WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Jacoby Creek WSA could have between 349 and 518 total housing units by 2025. According to Table 6-2, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 417. Therefore, the high rate growth projection for the study area is in excess of what the land can bear. It is unlikely that the high build-out estimate will be realized unless the State imposed sewer "waiver of prohibition" summarized in the Jacoby Creek Community Plan is dealt with.

The high build-out estimate for total development potential of 417 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 101 new housing units within the Jacoby Creek WSA.

### **6.5.6.1. Summary**

#### **Findings**

Jacoby Creek's water system is in good condition. The study area receives its water from the City of Arcata under contract. The biggest deficiency with the existing system is lack of adequate storage capacity. The study area has only about 27% of maximum day demand in storage capacity. In addition, some distribution piping within the system is less than six inches in diameter and unable to provide adequate fire flows. The Jacoby Creek WSA could receive up to 101 new housing units before reaching build-out conditions. Jacoby Creek will need to expand its water system infrastructure to serve this additional growth.

#### **Existing Capacity**

Availability of connections within the Jacoby Creek water system is not limited by either source or treatment capacity. HBMWD has sufficient water supply to meet District demands through connections with the City of Arcata.

#### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Jacoby Creek WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-23. Water system infrastructure assessment for the Jacoby Creek WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	562
# of Available Connections <sup>1</sup>	---
Source Capacity (MGD)	Not limiting (HBMWD)
Storage Capacity (MG)	0.174
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.628
Usage Rate (gpd/connection)	1,117
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.574 MG <sup>2</sup></i>	\$1,148,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$1,148,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$2,043</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$10.92</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	28
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.031 MG <sup>3</sup></i>	\$62,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$62,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$2,214</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$1,210,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$2,051</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$10.96</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	101
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.113 MGD <sup>3</sup></i>	\$226,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$226,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$2,237</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$1,374,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$2,072</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$11.08</b>

NOTES: <sup>1</sup> There is sufficient source supply from HBMWD to serve all development potential within the USA.

<sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.628 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.174 MG).

<sup>3</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,117 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.148 million loan would amount to approximately \$74,000 per year. With 562 existing ratepayers, monthly bills would have to be increased by approximately \$11 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.5.6.2. Description of Water Study Area**

A map showing the Jacoby Creek WSA is attached as Figure 6-1. The WSA encompasses most of the residential community of Jacoby Creek and extends along Old Arcata Road just south of Bayside Cutoff. The Jacoby Creek WSA has 899 total acres, of which 338 acres are underdeveloped and/or vacant parcels. Of this total acreage, 286 acres within the WSA are developable. With respect to development potential, the Jacoby Creek WSA contains mostly underdeveloped parcels with some vacant parcels that could see further residential development. However, portions of the WSA are also in the State imposed sewer "waiver prohibition" area, whose land use guidelines are covered in the Jacoby Creek Community Plan. The Jacoby Creek Community Plan limits density in areas not served by community wastewater to one dwelling unit per five acres.

The area's land use guidelines and development potential are covered in the Jacoby Creek Community Plan, which was last updated in December 1982.

#### **6.5.6.3. Water System**

##### **Service Area Description**

The Jacoby Creek WSA receives water service from the Jacoby Creek County Water District (JCWD), although portions of the study area rely on private wells, springs, or surface water intakes generally of poor quality. The JCWD receives its water from the City of Arcata under contract. The JCWD was formed in 1970 pursuant to Section 30000 et seq of the California Water Code to provide water only service within its boundaries. The City of Arcata operates and maintains the water system pursuant to their contract.

##### **System Standards**

JCWD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

##### **Fiscal Condition/Capital Replacement Program**

According to JCWD records, they operate their water system on an annual budget of approximately \$133,000. The majority of this income is from service charges, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District does not currently have a Capital Improvement Plan, and they currently do not have built up reserves.

##### **Water Demand**

According to the City of Arcata, JCWD purchased approximately 38 million gallons of drinking water in 2005 (City of Arcata, 2005). However, the 2007 DHS annual inspection report indicates Jacoby Creek purchased 114.6 MG of water in 2006. Average daily use is therefore estimated as 0.314 MGD. Peak daily use statistics are not available as the meter is only read every other month, but is estimated as twice the average daily use, or 0.628 MGD. The District has approximately 562 existing service connections and does not retail water to any other Districts.

## **Water Supply, Treatment, Distribution and Storage**

JCWD purchases treated water from the City of Arcata who receives water from HBMWD. JCWD's water system begins at a water meter located near Jacoby Creek School along Old Arcata Road. The system contains approximately 4 miles of water mains, three booster stations, and four water tanks. The distribution system contains approximately 75% 6-inch asbestos cement pipe, and approximately 25% two to six inch PVC pipe. The water tanks range in size from 10,000 gallons to 100,000 gallons, for a total storage capacity of 174,000 gallons. Water quality is representative of HBMWD's excellent water source and meets or exceeds State standards.

### **Condition Assessment**

**Overview.** Water service within the Jacoby Creek WSA is generally very good. Jacoby Creek's overall source capacity is tied to the City of Arcata. See Section 6.4.1 for further details.

**Current Deficiencies.** No significant deficiencies exist within the Jacoby Creek WSA other than those associated with the City of Arcata's overalls system. The study area has only about 27% of maximum day demand in storage capacity.

**Underserved Areas.** There are portions of the WSA outside of the City's sphere of influence and outside of the JCWD service boundaries.

### **Proposed Improvements**

**System Upgrades.** There are currently no plans for system upgrades in the Jacoby Creek WSA.

**Future Expansion.** There is some potential for growth within the Jacoby Creek WSA, and also the potential to serve existing residents within the WSA that are not currently served with water.

**Cost and Schedule of Improvements.** JCWD has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

## **6.5.7. Myers Flat WSA**

The County estimates there were 85 housing units within the Myers Flat WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Myers Flat WSA could have between 94 and 139 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 89. Therefore, both the low and high rate growth projections for the study area are in excess of what the land can bear.

The high build-out estimate for total development potential of 89 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 4 new housing units within the Myers Flat WSA.

### **6.5.7.1. Summary**

#### **Findings**

Myers Flat's water system is in poor condition. The MFMWS is under Court Order to find a new source of water. The existing well is limited in capacity, barely capable of meeting summertime demands. The Pete's Creek surface water source is in need of treatment in order to be compliant with SWTR. The system is in need of a D1 certified operator. In addition, some PVC piping within the distribution system is under six inches in diameter and unable to provide

adequate fire flows. Some 8-inch galvanized steel pipe is also in poor condition and in need of replacement. The Myers Flat WSA is expected to receive only 4 new housing units before reaching build-out conditions. Myers Flat will not need any major expansions to the system to serve this additional growth, aside from what is needed to bring the existing system into compliance with standards.

### Existing Capacity

Availability of connections within the Myers Flat water system is currently limited by both source capacity and lack of treatment. Source capacity is limited by the District's well, which is reportedly barely able to meet summertime demands. The District is under Court Order to find an alternative water source. The District's spring source is out of compliance with SWTR due to lack of treatment. Therefore, there are no available connections under the existing infrastructure.

### Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Myers Flat WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-24. Water system infrastructure assessment for the Myers Flat WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	103
# of Available Connections <sup>1</sup>	0
Source Capacity (MGD)	Unknown but limiting
Storage Capacity (MG)	0.3
Treatment Capacity (MGD)	0
Peak Day Use (MGD)	0.138
Usage Rate (gpd/connection)	1,340
<b>EXISTING CONDITIONS</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional source capacity – new well</i>	\$50,000
<i>Upgrade distribution system – 2 miles <sup>2</sup></i>	\$1,056,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$1,106,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$10,738</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$57.40</b>
<b>LOW &amp; HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	4
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>None needed <sup>3</sup></i>	\$0
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$0</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$0</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$1,106,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$10,336</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$55.25</b>

NOTES: <sup>1</sup> The number of available connections in the Myers Flat WSA was set at zero due to undersized source capacity and lack of treatment capacity.

<sup>2</sup> According to DHS annual inspection report, the distribution system contains galvanized steel pipe in poor condition. Personal communication with MFMWS staff indicates approximately 2 miles of GSP are in need of replacement. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

<sup>3</sup> Existing storage is sufficient to meet future maximum day demands and provide adequate fire flow storage. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.106 million loan would amount to approximately \$71,000 per year. With 103 existing ratepayers, monthly bills would have to be increased by approximately \$57 per month to fund this loan. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

The MFMWS is not a local government agency and is therefore not eligible for most local, state, and federal grant sources. The MFMWS would need to secure funding through company assets or loans to make improvements. The MFMWS is eligible to petition the CPUC to seek a water rate increase to recover the full cost of the improvements plus a set rate of return on investment.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.5.7.2. Description of Water Study Area**

A map showing the Myers Flat WSA is attached as Figure 6-9. The Myers Flat WSA is located in southern Humboldt County along the South Fork of the Eel River and U.S. Highway 101, approximately 50 miles south of Eureka. It lies between Weott to the north and Miranda to the south. The Myers Flat WSA has 165 total acres, of which 13 acres are underdeveloped and/or vacant parcels. Of this total acreage, 8 acres within the WSA are developable. With respect to development potential, the Myers Flat WSA consists of some vacant parcels that could see further development.

The area's land use guidelines and development potential are covered in the Avenue of the Giants Community Plan, which was last updated on April 11, 2000.

#### **6.5.7.3. Water System**

##### **Service Area Description**

The Myers Flat WSA is provided water service through the Myers Flat Mutual Water System (MFMWS).

##### **System Standards**

MFMWS's water system is a private water system. However, public water system standards apply to private water systems that serve over 25 people for more than 60 days per year. Therefore, the water system must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

## **Fiscal Condition/Capital Replacement Program**

According to MFMWS records, the system operates its water system on an annual budget of approximately \$45,000. System funding is provided through service charges and connection fees. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently do not have accumulated reserves.

## **Water Demand**

MFMWS produced approximately 25.2 million gallons of drinking water in 2005, according to the 2007 DHS annual inspection report. Average daily use for the entire District is estimated at 0.069 MGD. The inspection report failed to report peak daily use, but according to the Avenue of the Giants Community Plan, average daily demand is 100,000 gallons per day on summer week days and 130,000 per day on weekends. For the purposes of this report, maximum daily demand is estimated as twice average day usage, or approximately 138,000 gallons per day. This is representative of the large summer influx of residents in the community. The Myers Flat WSA has approximately 103 existing connections, all of which are metered. Approximately 16 of the connections are commercial.

## **Water Supply, Treatment, Distribution and Storage**

MFMWS's water supply consists of a well of unknown capacity and a surface water source on Pete's Creek. The latter source was the primary source of drinking water prior to 1998, but is no longer an approved source due to lack of treatment. MFMWS also has an emergency connection to a State Park well in Hidden Springs State Park.

According to the 2007 DHS inspection report, the existing well has unknown capacity but is barely able to meet peak summertime demands. Sodium hypochlorite is pumped into the well discharge line, which discharges to storage. The system contains a 300,000 gallon concrete storage tank that is balanced on distribution, and therefore does not receive chlorine contact time credit based on SWTR. There is one pressure zone within the WSA, all gravity fed by this storage tank. The system contains approximately six miles of distribution piping, consisting of PVC and galvanized steel pipe varying in size between 4 inches and 8 inches in diameter.

## **Condition Assessment**

**Overview.** Water service within the Myers Flat WSA is poor. The system is under a court order to find a new source of water and other parts of the system are in significant need of repair and/or replacement. Unfortunately, it is extremely difficult to find funding for the existing system for two main reasons: the majority of the WSA is under the 100-year floodplain, and it is difficult to obtain funding as a mutual water system. Efforts are underway to convert into a community services district.

The existing well source is of unknown capacity and reportedly barely meets peak summertime demands. Therefore, it is assumed that current peak water use is at approximately 100% of available production capacity.

**Current Deficiencies.** The MFMWS is under Court Order to find a new source of water. The existing well is limited in capacity, barely capable of meeting summertime demands. The surface water source is in need of treatment in order to be compliant with SWTR. The storage tank roof is in disrepair and no longer provides a barrier to entry of rainwater or vermin. The system is also in need of a D1 certified operator.

**Underserved Areas.** All areas within the WSA are serviced with water.

### **Proposed Improvements**

**System Upgrades.** The District has no plans for system upgrades at this time.

**Future Expansion.** The District has no plans for expansion of services or District boundaries.

**Cost and Schedule of Improvements.** An infrastructure assessment for the District was recently completed by W&K in 2006. Identified improvement projects include upgrades to the distribution system, development of a new well, and upgrades to storage. Total costs were estimated at approximately \$2.2 million.

### **6.5.8. Orleans WSA**

The County estimates there were 196 housing units within the Orleans WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Orleans WSA could have between 217 and 321 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 416. Therefore, the growth projections for the study area are within the range of what the land can bear.

The high build-out estimate for total development potential of 416 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 220 new housing units within the Orleans WSA.

#### **6.5.8.1. Summary**

##### **Findings**

Orleans' water system is in good condition overall but does not have adequate storage. Source capacity from an infiltration gallery in Peach Creek is unknown, but reportedly more than enough to satisfy maximum day demands. Additional treatment capacity is also available. Water usage rates are some of the highest in the County, in excess of 3,000 gallons per day per connection, even after subtracting out water usage for the vineyards and orchards. The Orleans WSA is expected to receive 220 new housing units before reaching build-out conditions. Orleans will need to expand its water system infrastructure to serve this additional growth.

##### **Existing Capacity**

Availability of connections within the Orleans water system is currently limited by the treatment capacity. Source capacity is reportedly not an issue. Treatment capacity is estimated at 0.495 MGD if the filters are operated 22 hours per day (time allowed for backwash cycle). Given existing maximum day demands are estimated at 0.513 MGD, the system is operating at approximately 104% of treatment capacity. However, these filters have a combined recommended capacity of 375 gpm, but DHS has indicated that they could be loaded at a combined rate of 450 gpm while still meeting all applicable standards. Therefore, current peak water use is estimated at approximately 79% of available treatment capacity. Therefore, there are no available connections under the existing infrastructure.

## Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Orleans WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-25. Water system infrastructure assessment for the Orleans WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	149
# of Available Connections <sup>1</sup>	0
Source Capacity (MGD)	Unknown but sufficient
Storage Capacity (MG)	0.1
Treatment Capacity (MGD)	0.495
Peak Day Use (MGD)	0.513
Usage Rate (gpd/connection)	3,443
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.533 MG <sup>2</sup></i>	\$1,066,000
<i>Additional treatment capacity – 0.018 MGD <sup>3</sup></i>	\$90,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$1,156,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$7,758</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$41.47</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	50
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.172 MG <sup>4</sup></i>	\$344,000
<i>Additional treatment capacity – 0.172 MGD <sup>3</sup></i>	\$860,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$1,204,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$24,080</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$2,360,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$11,859</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$63.39</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	220
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.757 MG <sup>4</sup></i>	\$1,514,000
<i>Additional treatment capacity – 0.757 MGD <sup>3</sup></i>	\$3,785,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$5,299,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$24,086</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$6,455,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$17,493</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$93.51</b>

NOTES: <sup>1</sup> The number of available connections in the Orleans study area was estimated based on the District currently being at 104% of its treatment capacity. Source capacity is not an issue.

<sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.513 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.1 MG).

<sup>3</sup> Future maximum day demands are estimated at 0.685 for low build-out and 1.27 MGD for high build-out. Existing treatment capacity is estimated at 0.495 MGD.

<sup>4</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 3,443 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.156 million loan would amount to approximately \$74,000 per year. With 149 existing ratepayers, monthly bills would have to be increased by \$41 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.5.8.2. Description of Water Study Area**

A map showing the Orleans WSA is attached as Figure 6-19. The Orleans WSA is located in northeastern Humboldt County along the Klamath River and U.S. Highway 96. It lies between Weitchpec to the southwest and Somes Bar to the northeast. The Orleans WSA has 1,057 total acres, of which 428 acres are underdeveloped and/or vacant parcels. Of this total acreage, 273 acres within the WSA are developable. With respect to development potential, the Orleans WSA consists of both vacant and underdeveloped parcels that could see further residential development.

The area's land use guidelines and development potential are covered in the Humboldt County General Plan.

#### **6.5.8.3. Water System Service Area Description**

The Orleans WSA is provided water service through the Orleans Community Services District (OCSD). The OCSD was originally organized in 1973 pursuant to Community Services District Law. The governing board of the District is the Board of Directors. The registered voters of the District elect the Board of Directors. The District was formed for the purpose of providing water, sewer, and fire protection services, but currently provides only water and fire protection services.

#### **System Standards**

OCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

According to OCSD records, the District operates its water system on an annual budget of approximately \$95000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District developed a Capital Improvement Plan in 2007, and they currently do not have built up reserves.

## Water Demand

According to the 2005 DHS annual inspection report, OCSD retailed approximately 26 million gallons of drinking water in 2005. Average daily use for the entire District is estimated at 0.071 MGD, and peak daily use is estimated at approximately 0.513 MGD. The Orleans WSA has approximately 149 active connections and 15 inactive connections. Only one connection used by the volunteer fire department is unmetered.

Peak daily use corresponds to usage rates of approximately 3,443 gpd/connection. There are some large water users, such as orchards, vineyards, and the Forest Service, within the system, but their usage rates amount to only approximately 60,000 gpd during summer months. Therefore, water use is still extremely high for the remaining connections.

## Water Supply, Treatment, Distribution and Storage

OCSD's water supply consists of an infiltration gallery within Peach Creek with unknown but adequate capacity. Water flows by gravity to treatment, where it is prechlorinated and then filtered through three parallel Permutit automatic backwash filters, each with a rated capacity of 125 gpm. Total treatment capacity is therefore estimated at approximately 0.495 MGD, if run for 22 hours per day allowing time for backwash cycling. The District recently began feeding polymer or other coagulant. Water is then stored in a 100,000 gallon redwood tank and fed to distribution. Two pressure zones exist within the system, with one zone served by the redwood storage tank and a second zone served by a booster pump. The distribution system consists of ten to twelve miles of mostly asbestos cement pipe with some ductile iron, PVC, and steel, all ranging in size between 2 inches and 8 inches in diameter. The distribution system was installed in 1977 and 1997.

## Condition Assessment

**Overview.** Water service within the Orleans WSA is generally very good. Peak water demands are approximately 356 gpm. The filters have a combined recommended capacity of 375 gpm, but DHS has indicated that they could be loaded at a combined rate of 450 gpm while still meeting all applicable standards. Therefore, current peak water use is estimated at approximately 79% of available treatment capacity if DHS loading rates are used but 104% using the manufacturers' recommended maximum loading rate. Source capacity is not an issue.

**Current Deficiencies.** The only major deficiency with the system is lack of adequate storage capacity. The DHS 2007 annual report did not recognize any other deficiencies aside from the need for a cross-connection ordinance and routine monitoring.

**Underserved Areas.** All areas within the WSA are serviced with water.

## Proposed Improvements

**System Upgrades.** The District has plans to install additional storage, increase treatment capacity, upgrade the infiltration gallery, and expand the main water line on Highway 96 with installation of several fire hydrants in an active brush fire area.

**Future Expansion.** The District has no plans for expansion of services or District boundaries

**Cost and Schedule of Improvements.** The District has developed a five to twenty year Capital Improvement Plan that covers costs and schedules for improvements to its water system. These

include additional storage, an increase in treatment capacity, upgrades to the infiltration gallery, and future expansion of the main water line on Highway 96.

### **6.5.9. Phillipsville WSA**

The County estimates there were 97 housing units within the Phillipsville WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Phillipsville WSA could have between 107 and 159 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 108. Therefore, the high growth rate projection for the study area is in excess of what the land can bear.

The high build-out estimate for total development potential of 108 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 11 new housing units within the Phillipsville WSA.

#### **6.5.9.1. Summary**

##### **Findings**

Phillipsville's water system is in poor condition. The system relies on two water sources to meet maximum day demands – an untreated surface water spring that is not in compliance with SWTR and a groundwater well high in iron and manganese. Storage capacity is currently inadequate to even meet one day of maximum day demands. The distribution system consists of non-standard materials, such as electrical conduit, and the sizing and type of piping in the rest of the system is unknown. The District is seeking Proposition 50 funding to upgrade its water infrastructure. The Phillipsville WSA is expected to receive 11 new housing units before reaching build-out conditions. Phillipsville will need to expand its water system infrastructure to serve this additional growth.

##### **Existing Capacity**

Availability of connections within the Phillipsville water system is currently limited by both its source capacity and lack of treatment. The District relies on two sources of water, as the existing spring is unable to meet summertime demands. The spring is also out of compliance with SWTR due to lack of treatment. It is unclear whether the well would be able to meet demands on its own, but the distribution system is not set up to allow this and the well also suffers from high levels of iron and manganese. Therefore, there are no available connections under the existing infrastructure.

##### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Phillipsville WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-26. Water system infrastructure assessment for the Phillipsville WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	65
# of Available Connections <sup>1</sup>	0
Source Capacity (MGD)	Unknown but sufficient
Storage Capacity (MG)	0.075
Treatment Capacity (MGD)	0
Peak Day Use (MGD)	0.085
Usage Rate (gpd/connection)	1,308
<b>EXISTING CONDITIONS</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.130 MG <sup>2</sup></i>	\$260,000
<i>Install treatment system – 0.085 MG <sup>3</sup></i>	\$425,000
<i>Replace distribution piping – 1 mile <sup>4</sup></i>	\$528,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$1,213,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$18,662</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$99.76</b>
<b>LOW &amp; HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	11
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.14 MG <sup>5</sup></i>	\$28,000
<i>Additional treatment capacity – 0.14 MG <sup>3</sup></i>	\$70,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$98,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$8,909</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$1,311,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$17,250</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$92.21</b>

- NOTES: <sup>1</sup> The number of available connections in the Phillipsville study area was set at zero due to problems with water supply sources and non-compliance with SWTR.
- <sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.085 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.075 MG).
- <sup>3</sup> A new treatment plant is needed to meet both existing and future maximum day demands of 0.1 MG.
- <sup>4</sup> According to the DHS annual inspection report, the exact amounts of any particular piping are unknown. However, electrical conduit is known to be used within the system along with undersized water mains. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).
- <sup>5</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (11 new connections x 1,308 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.213 million loan would amount to approximately \$78,000 per year. With 65 existing ratepayers, monthly bills would have to be increased by approximately \$100 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown

under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.5.9.2. Description of Water Study Area**

A map showing the Phillippsville WSA is attached as Figure 6-20. The Phillippsville WSA is located in southern Humboldt County along the South Fork of the Eel River and U.S. Highway 101, approximately 60 miles south of Eureka. It lies between Miranda to the north and Redway to the south. The Phillippsville WSA has 326 total acres, of which 114 acres are underdeveloped and/or vacant parcels. Of this total acreage, 34 acres within the WSA are developable. With respect to development potential, the Phillippsville WSA consists of some vacant parcels that could see further development.

The area's land use guidelines and development potential are covered in the Avenue of the Giants Community Plan, which was last updated on April 11, 2000.

#### **6.5.9.3. Water System Service Area Description**

The Phillippsville WSA is provided water service through the Phillippsville Community Services District (PCSD). The PCSD was declared formed in August of 1989 after a successful special election was held in order to assume responsibility for the Phillippsville Mutual Water Association water facilities. The District was established for the purpose of supplying potable water and fire protection services. The governing board is a five member Board of Directors.

#### **System Standards**

PCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

According to PCSD records, the District operates its water system on an annual budget of approximately \$35,000. The majority of this income is from service charges, but funding also comes from interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently do not have built up reserves.

#### **Water Demand**

According to the 2004 DHS annual inspection report, PCSD retailed an estimated 8.75 million gallons of drinking water in 2003. Average daily use for the entire District is estimated at 0.024 MGD, and peak daily use is estimated at approximately 0.085 MGD. The Phillippsville WSA has approximately 65 active service connections. The system does not have a master meter to monitor production.

#### **Water Supply, Treatment, Distribution and Storage**

PCSD's water supply consists of a groundwater well of unknown capacity and a surface water spring source with variable capacity. The spring source is unable to meet summertime demands, and therefore only serves the upper portion of the system during low flows while the well supplies water to the rest of the system. The well is primarily used during dry months. The spring is believed

to be under the influence of surface water, is not filtered, and is not continuously chlorinated with a reliable method (chlorine tablets). It is therefore not in compliance with SWTR. The well is continuously disinfected with a chlorination feed system located in the well housing. The well has high levels of iron and manganese and suffers from low pH, which causes problems with coloration and corrosion of the distribution system.

The system has a total of eight storage tanks ranging in size from 250 gallons to 60,000 gallons for a total combined capacity of 74,850 gallons. The system has numerous small pressure zones with anywhere between two and four connections. The distribution system consists of approximately two miles of a variety of piping, not all of which meet standards. The exact amounts of any particular piping are unknown. Some electrical conduit is currently being used for water piping. The system has replaced approximately 2,050 feet of piping since 2000 with PVC piping.

### **Condition Assessment**

**Overview.** The system has a long history of mismanagement and problems. The water system is in poor condition and in significant need for repairs and upgrades. The District hopes to reconfigure the system and is in the process of researching funds in order to bring the system into compliance. The system is currently not in compliance with SWTR due to an untreated spring source.

Source capacity is unknown. Therefore, it is unclear how current peak water use compares to overall source capacity. The spring is reportedly unable to meet summertime demands, and the well is used to supplement supply.

**Current Deficiencies.** The existing spring source is not in compliance with SWTR, and parts of the distribution system do not meet DHS standards. The system has other deficiencies as noted above.

**Underserved Areas.** All areas within the WSA are serviced with water.

### **Proposed Improvements**

**System Upgrades.** The District is seeking Proposition 50 funds to upgrade the water system infrastructure.

**Future Expansion.** The District has no plans for expansion of services or District boundaries.

**Cost and Schedule of Improvements.** The District has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

### **6.5.10. Redcrest WSA**

The County estimates there were 33 housing units within the Redcrest WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Redcrest WSA could have between 36 and 54 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 49. Therefore, the high growth rate projection for the study area is in excess of what the land can bear.

The high build-out estimate for total development potential of 49 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 16 new housing units within the Redcrest WSA.

### **6.5.10.1. Summary**

#### **Findings**

Redcrest's water system is in poor condition. The system is not in compliance with SWTR due to high turbidity levels following filtration. The system failed to meet turbidity requirements for six of twelve months in 2006. The system also currently does not meet Waterworks Standards for storage and distribution due to inadequate storage and small diameter water mains. The system has also been delinquent on raw water chemical and distribution system monitoring that needs to be regularly performed.

The Redcrest WSA is expected to receive 16 new housing units before reaching build-out conditions. In addition to bringing the existing system into compliance, Redcrest will need to expand its water system infrastructure to serve this additional growth.

#### **Existing Capacity**

Availability of connections within the Redcrest water system is currently limited by source capacity and noncompliance with SWTR. Source capacity is limited by the District's infiltration gallery and is estimated at 0.057 MGD if the pumps are operated 24 hours per day. Although maximum day demands are only 0.048 MGD, the treatment system is currently not able to meet turbidity requirements and is therefore not in compliance with SWTR. Therefore, there are no available connections under the existing infrastructure.

#### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Redcrest WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-27. Water system infrastructure assessment for the Redcrest WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	33
# of Available Connections <sup>1</sup>	0
Source Capacity (MGD)	0.057
Storage Capacity (MG)	0.027
Treatment Capacity (MGD)	0
Peak Day Use (MGD)	0.048
Usage Rate (gpd/connection)	1,455
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.142 MG <sup>2</sup></i>	\$284,000
<i>Install roughing filters – 0.048 MGD <sup>3</sup></i>	\$330,000
<i>Replace distribution piping – 0.5 miles <sup>4</sup></i>	\$264,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$878,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$26,606</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$142.23</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	12
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.017 MG <sup>5</sup></i>	\$34,000
<i>Additional source capacity – new well</i>	\$50,000
<i>Additional roughing filter capacity – 0.017 MGD <sup>3</sup></i>	\$85,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$169,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$14,083</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$1,047,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$23,267</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$124.37</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	16
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.023 MG <sup>5</sup></i>	\$46,000
<i>Additional source capacity – new well</i>	\$50,000
<i>Additional roughing filter capacity – 0.023 MGD <sup>3</sup></i>	\$115,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$211,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$13,188</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$1,089,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$22,224</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$118.80</b>

NOTES: <sup>1</sup> The number of available connections in the Redcrest study area was set at zero due to the system being in noncompliance with the SWTR.

<sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.048 MG) plus minimum fire storage of 120,000 gallons minus existing storage (26,500 gallons).

<sup>3</sup> Roughing filters are needed to improve treatment, as the system does not currently meet SWTR requirements for turbidity. Maximum day demands are estimated at 0.065 MGD for low build-out and 0.071 MGD for high build-out.

<sup>4</sup> According to the DHS annual inspection report, the District has a number of old, undersized water mains in poor to fair condition that will likely need replacement during the planning time frame. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

<sup>5</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 1,455 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$878,000 loan would amount to approximately \$56,000 per year. With 33 existing ratepayers, monthly bills would have to be increased by approximately \$142 per month to fund this loan. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

The RWW is not a local government agency and is therefore not eligible for most local, state, and federal grant sources. The RWW would need to secure funding through company assets or loans to make improvements. The RWW is eligible to petition the CPUC to seek a water rate increase to recover the full cost of the improvements plus a set rate of return on investment.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.5.10.2. Description of Water Study Area**

A map showing the Redcrest WSA is attached as Figure 6-21. The Redcrest WSA is located in southern Humboldt County along the South Fork Eel River and U.S. Highway 101, approximately 40 miles south of Eureka. It lies between Holmes to the north and Englewood to the south. The Redcrest WSA has 280 total acres, of which 23 acres are underdeveloped and/or vacant parcels. Of this total acreage, 20 acres within the WSA are developable. With respect to development potential, the Redcrest WSA consists of some vacant parcels that could see further development.

The area's land use guidelines and development potential are covered in the Avenue of the Giants Community Plan, which was last updated on April 11, 2000.

#### **6.5.10.3. Water System Service Area Description**

The Redcrest WSA receives water service from a privately owned system owned and operated by Redcrest Water Works (RWW), which is equivalent to a mutual water association. RWW was formed for the purpose of providing water service to the community.

#### **System Standards**

RWW's water system is a private water system. However, public water system standards apply to private water systems that serve over 25 people for more than 60 days per year. Therefore, the water system must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

The RWW operating budget is unknown. Income is from service charges, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through

revenues. The District does not currently have a Capital Improvement Plan, and they currently do not have built up reserves.

### **Water Demand**

According to the DHS 2007 inspection report, RWW produced 8.535 million gallons of drinking water in 2005. Average daily use is therefore estimated at approximately 0.023 MGD, and peak daily use was reported as 0.048 MGD. The District currently provides water service to 33 residential connections, none of which are metered.

### **Water Supply, Treatment, Distribution and Storage**

RWW's water source consists of an infiltration gallery located in Chadd Creek behind a dam and not in the live channel, with an estimated capacity of 40 – 50 gpm (0.057 – 0.072 MGD). The gallery has historically been rebuilt every year due to winter storms. The RWW also has a spring source on emergency standby during winter storms; the source has lower turbidity to reduce load on the filters during storms. Water from the infiltration gallery enters a 6 foot diameter grit tank followed by six filter tanks, each 9.5 feet in diameter and filled with 3 feet of sand. The flow is distributed evenly to each filter at a loading rate of approximately 0.09 gpm/ft<sup>2</sup>. However, the system consistently fails to meet DHS turbidity requirements.

Water is chlorinated prior to storage, which consists of four tanks ranging in size from 3,500 gallons to 10,000 gallons for a total storage capacity of 26,500 gallons. The system does not currently meet DHS storage requirements. The distribution system consists of approximately 0.7 miles of transite, PVC, GSP and PE pipe. The GSP and PE pipes do not meet distribution system standards due to inadequate size (2-inch).

### **Condition Assessment**

**Overview.** Water service within the Redcrest WSA is poor. The system is currently not in compliance with SWTR. Current peak water use is at approximately 84% of available production capacity.

**Current Deficiencies.** The system is not in compliance with SWTR due to high turbidity levels following filtration. The system failed to meet turbidity requirements for six of twelve months in 2006. The system also currently does not meet Waterworks Standards or fire flow standards for storage and distribution due to inadequate storage and small diameter water mains. The system has also been delinquent on raw water chemical and distribution system monitoring that needs to be regularly performed.

**Underserved Areas.** The RWW serves all areas within its service boundaries.

### **Proposed Improvements**

**System Upgrades.** The RWW is considering a roughing filter to reduce load on the slow sand filters and improve turbidity reduction. They also have plans to add 10,000 gallons of raw water storage, but this is still insufficient to meet the required minimum storage per Waterworks Standards. Storage and distribution for fire flow should also be considered.

**Future Expansion.** The District has no plans for expansion at this time.

**Cost and Schedule of Improvements.** RWW has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

### **6.5.11. Riverside WSA**

The County estimates there were 116 housing units within the Riverside WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Riverside WSA could have between 128 and 190 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 121. Therefore, both the low and high growth rate projections for the study area are in excess of what the land can bear.

The high build-out estimate for total development potential of 121 housing units in the WSA was used for infrastructure assessment and recommendations. This represents only 5 new housing units within the Riverside WSA.

#### **6.5.11.1. Summary**

##### **Findings**

Riverside's water system is in good condition overall. The District does not currently have a licensed water distribution operator. The only other deficiencies include lack of fire hydrants, distribution system with small diameter mains, and lack of fire suppression storage. The Riverside WSA is expected to receive only 5 new housing units before reaching build-out conditions. Riverside will need only minor expansions to its water system infrastructure to serve this additional growth.

##### **Existing Capacity**

Availability of connections within the Riverside water system is currently limited by the source capacity of its wells. Well production is estimated at 0.074 MGD over a 24 hour period. Given existing maximum day demands are estimated at 0.046 MGD, the system is operating at approximately 62% of source capacity. Therefore, there are approximately 60 available connections under the existing infrastructure.

##### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Riverside WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-28. Water system infrastructure assessment for the Riverside WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	98
# of Available Connections <sup>1</sup>	60
Source Capacity (MGD)	0.074
Storage Capacity (MG)	0.066
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	0.046
Usage Rate (gpd/connection)	469
<b>EXISTING CONDITIONS</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.100 MG</i> <sup>2</sup>	\$200,000
<i>Upgrade distribution system – 4 miles</i> <sup>3</sup>	\$2,112,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$2,312,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$23,592</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$126.11</b>
<b>LOW &amp; HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	5
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 2,500 gal.</i> <sup>4</sup>	\$5,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$5,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$1,000</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$2,317,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$22,495</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$120.25</b>

NOTES: <sup>1</sup> The number of available connections in the Riverside study area was estimated based on the system currently being at 62% of its source capacity.

<sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.046 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.066 MG).

<sup>3</sup> Existing distribution system is 4-inch or smaller diameter pipe unable to provide adequate fire flows.

<sup>4</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (5 new connections x 469 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$2.312 million loan would amount to approximately \$148,000 per year. With 98 existing ratepayers, monthly bills would have to be increased by approximately \$126 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

### **6.5.11.2. Description of Water Study Area**

A map showing the Riverside WSA is attached as Figure 6-22. The WSA is comprised of mostly farmlands and the community of Port Kenyon, a small residential cluster located on the Salt River just northwest of the City of Ferndale, as well as a cluster of homes along Centerville and Meridian Roads. The majority of the District is located in the coastal zone within the Eel River Area Plan. The southern tip of the District is located outside the coastal zone within the County Framework Plan. Because the majority of the District includes properties in the Ferndale Bottoms, the Eel River Area Plan designates the area as Agriculture Exclusive, with the Port Kenyon and Meridian Road areas designated Residential Exurban. The Residential Exurban designation "reflects the communities' desires to maintain the existing densities and levels of development while protecting adjacent agricultural areas."

The Riverside WSA has 1,977 total acres, of which 56 acres are underdeveloped and/or vacant parcels. Of this total acreage, 34 acres within the WSA are developable. With respect to development potential, the Riverside WSA contains mostly underdeveloped parcels with some vacant parcels that could see further residential development.

### **6.5.11.3. Water System**

#### **Service Area Description**

The Riverside WSA receives water service from the Riverside Community Services District (RCSD). The RCSD was formed on June 25, 1991 under Community Services District law pursuant to sections 61000-61934 of the Government Code. The governing board is elected and consists of a five (5) member Board of Directors to supervise the business of the District. The District was formed for the purposes of securing a state grant to bring an existing water system into compliance with state water quality requirements. The District provides water services for both domestic and agricultural purposes.

#### **System Standards**

RCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

According to RCSD records, they operate their water system on an annual budget of approximately \$52,000. The majority of this income is from service charges, but funding also comes from interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District does not currently have a Capital Improvement Plan, and they currently have \$53,000 in reserves.

#### **Water Demand**

According to the DHS 2005 inspection report, RCSD produced 12.5 million gallons of drinking water in 2005. Average daily use was approximately 0.034 MGD, and peak daily use was approximately 0.046 MGD. The District currently provides water service to 74 residential customers and 24 agricultural operations (dairies on the Ferndale bottoms).

#### **Water Supply, Treatment, Distribution and Storage**

RCSD's water source consists of two gravity fed artesian wells and one deep well with a maximum production capacity of approximately 74,000 gallons of water a day. The artesian wells are capable of producing approximately 22 gpm, and the deep well produces about 30

gpm. The artesian wells are the primary sources of water, and water from these runs by gravity to a booster pump clear well which pumps water to the main 60,000 gallon reinforced concrete storage tank and then to distribution via gravity flow. The deep well is only used to supplement the artesian wells, mostly in summer. This well pumps to a 6,200 gallon storage tank that then flows to the booster pump clear well. The distribution system consist of approximately 5 miles of mainly of PVC pipe (2-inch to 4-inch) with very little AC pipe and some galvanized steel pipe used to cross the Salt Creek Bridge at Dillon Creek.

### **Condition Assessment**

**Overview.** Water service within the Riverside WSA is generally good. Current peak water use is at approximately 62% of available production capacity.

**Current Deficiencies.** The District's deep well can only be used as an auxiliary well due to high manganese content. The District does not currently have any fire hydrants. Due to small main size and low pressure, the system is not capable of supporting fire suppression uses.

**Underserved Areas.** The RCSD serves all areas within its service boundaries.

### **Proposed Improvements**

**System Upgrades.** The District has no planned system upgrades.

**Future Expansion.** There is very little potential for growth within the Riverside WSA, and also the potential to serve existing residents within the WSA that are not currently served with water. The remainder of the District is in the Eel River floodplain and is under Coastal Commission jurisdiction, so further development is unlikely.

**Cost and Schedule of Improvements.** RCSD has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

## **6.5.12. Westhaven WSA**

The County estimates there were 617 housing units within the Westhaven WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Westhaven WSA could have between 682 and 1,011 total housing units by 2025. According to Table 1-6, the high build-out estimate for total development potential within the WSA, which takes into consideration physical and zoning constraints, is 1,041. Therefore, both the growth rate projections for the study area are within the range of what the land can bear.

The high build-out estimate for total development potential of 1,041 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 424 new housing units within the Westhaven WSA.

### **6.5.12.1. Summary**

#### **Findings**

The Westhaven CSD's water system is in fair condition overall. Recent efforts have focused on conservation – installing meters throughout the system and repairing leaks. This CSD suffers from limited source capacity. Additional sources have been sought but none identified. Without an additional source of water, development within the area will be severely limited.

The Westhaven WSA is expected to receive only 424 new housing units before reaching build-out conditions. In addition to finding additional source capacity, Westhaven will need to expand its water system infrastructure to serve this additional growth.

### **Existing Capacity**

Availability of connections within the Westhaven water system is currently limited by the source capacity of its springs and well. Total source capacity varies between 0.057 and 0.086 MGD over a 24 hour period. Given existing maximum day demands are estimated at 0.066 MGD, the system operates in excess of summertime source capacity. Therefore, there are no available connections under the existing infrastructure.

### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Westhaven WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 6-29. Water system infrastructure assessment for the Westhaven WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections	233
# of Available Connections <sup>1</sup>	0
Source Capacity (MGD)	0.058
Storage Capacity (MG)	0.1
Treatment Capacity (MGD)	0.115
Peak Day Use (MGD)	0.066
Usage Rate (gpd/connection)	283
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.086 MG <sup>2</sup></i>	\$172,000
<i>Additional source capacity – new well</i>	\$50,000
<i>Upgrade distribution system – 4 miles <sup>3</sup></i>	\$2,112,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$2,334,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$10,017</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$53.55</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	79
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.022 MG <sup>4</sup></i>	\$44,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$44,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$557</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$2,378,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$7,622</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$40.74</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	424
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage – 0.120 MG <sup>4</sup></i>	\$240,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$240,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$566</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$2,574,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$3,918</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$20.94</b>

NOTES: <sup>1</sup> The number of available connections in the Westhaven study area was set at zero due to inadequate source capacity.

<sup>2</sup> Additional storage requirements are based on 1 day of existing maximum day use (0.066 MG) plus minimum fire storage of 120,000 gallons minus existing storage (0.1 MG).

<sup>3</sup> Estimated by District staff. Mostly PE pipe over 40 years old and prone to failure but some other undersized mains. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

<sup>4</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 283 gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$2.334 million loan would amount to approximately \$150,000 per year. With 233 existing ratepayers, monthly bills would have to be increased by approximately \$54 per month to fund this loan. In reality, we would expect the District to apply for and hopefully

obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **6.5.12.2. Description of Water Study Area**

A map showing the Westhaven WSA is attached as Figure 6-23. The WSA encompasses a small area outside of the City of Trinidad City boundary but within its sphere of influence, but the majority of the WSA covers the Westhaven and Moonstone residential areas outside of the City's sphere of influence. The WSA encompasses roughly the coastal area from Little River on its southern border up to Trinidad on its north. The area's land use guidelines and development potential are covered in both the Humboldt County Framework General Plan and North Coastal Area Plan.

The Westhaven WSA has 2,072 total acres, of which 668 acres are underdeveloped and/or vacant parcels. Of this total acreage, 541 acres within the WSA are developable. With respect to development potential, the Westhaven WSA contains both underdeveloped and vacant parcels that could see further residential development subject to the North Coastal Area Plan.

#### **6.5.12.3. Water System Service Area Description**

Approximately 15% of the Westhaven WSA receives water service from the Westhaven Community Services District (WCSD). The remainder is outside any water related special district SOI or boundaries. The Certificate of Completion was filed for the WCSD on May 17, and the first CSD Board was appointed by the Board of Supervisors on October 27, 1987. The governing board is elected and consists of a five (5) member Board of Directors to supervise the business of the District. The District was formed under increasing pressure from the State Department of Health Services to install new storage and treatment facilities. Previously the Westhaven Mutual Water Company (WMWC), incorporated in 1968 and consisting of up to 186 shareholders, the District was formed in hopes to better be able to make needed improvements as a public entity. After the District was formed, it assumed ownership and operation of all facilities then owned and operated by WMWC. Portions of the WSA (approximately 15 connections within WCSD service boundaries) receive water service from the Moonstone Heights Mutual Water Association. The northern portions of the service area also receive water from the City of Trinidad

#### **System Standards**

WCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

## **Fiscal Condition/Capital Replacement Program**

According to WCSD records, they operate their water system on an annual budget of approximately \$170,000. The District's income is entirely from service charges. Replacement or depreciation funds are accumulated through water service revenues. The District does not currently have a Capital Improvement Plan, and they currently have \$80,000 in capital reserves.

## **Water Demand**

According to the DHS 2005 inspection report, WCSD produced 14.3 million gallons of drinking water in 2004. Average daily use was approximately 0.039 MGD, and peak daily use was approximately 0.066 MGD. The District currently provides water service to 233 residential customers.

## **Water Supply, Treatment, Distribution and Storage**

The system is supplied by three small, spring-fed tributaries of Two Creek at the eastern edge of the community and a 100-foot deep well within the residential area. The creek source represents approximately 75% of the total source capacity, with the well accounting for the remaining 25%. Source capacity varies between 40 – 60 gpm (0.058 – 0.086 MGD). During the system-upgrading project in the early 1990s, the District expended considerable resources in efforts to locate additional local water sources. Except for the well, no additional sources that could be developed in an economically feasible manner were located within the District. During this same time, an attempt by the District to develop a municipal well just outside the northeast boundary failed due to local political impasse. The District has installed meters on all residential connections recently, which has facilitated the District in identifying leaks and distribution system problems. The District also recently installed a calcite filter at the well to raise pH of the well water.

Source water is directed to a sedimentation chamber followed by slow sand filtration. The filters have a capacity of 115,200 gpd. After filtration, water is chlorinated prior to storage in a 100,000 gallon concrete storage tank. Three pressure zones exist within the WCSD: the main zone served by the storage tank, a high pressure zone serviced by a booster station at the chlorination building, and a low pressure zone (pressure reduced from main zone) on the west side of U.S. Highway 101. 35% of the distribution system consists of 6-inch or 4-inch C-900 PVC, 20% is 4-inch or 3-inch AC, 10% is schedule 40 PVC and the remaining 35% is 2-inch or smaller 40-year-old polyethylene. The distribution system contains approximately 7.5 miles of piping overall, 50% of which is less than 4 inches in diameter.

## **Condition Assessment**

**Overview.** Water service within the Westhaven CSD is generally fair. However, source capacity continues to be a problem. Source capacity currently varies between 40 – 60 gpm, compared to a maximum day demand of 0.66 MGD, or approximately 46 gpm.

**Current Deficiencies.** No serious deficiencies were identified in the most recent DHS inspection, aside from the source capacity issue stated above. Recommendation were made to vent the well, submit a cross connection control plan, replace roof on storage tank, and maintain monitoring (chemical monitoring of the well, asbestos sampling, and bacteriological sampling). WCSD water storage does not meet fire flow requirements, and 50% of the water mains are smaller than the 4-inch minimum set forth in ISO standards. None of the distribution system could provide the 1,000 gpm fire flow in the State Fire Code.

**Underserved Areas.** The WCSD serves all areas within its service boundaries.

## Proposed Improvements

**System Upgrades.** The District plans on replacing the storage tank roof. Plans are also underway to upgrade the distribution system's undersized water mains, increase storage capacity, and further explore additional sources of water.

**Future Expansion.** The District has no plans for future expansion, and is quite limited by source capacity. Additional source capacity would need to be located for WCSD, or another water related special district, to provide water service to other portions of the Westhaven WSA. In addition, LAFCo would need to approve any changes to local agencies boundaries or SOI.

**Cost and Schedule of Improvements.** WCSD has not developed a Capital Improvement Plan to date that covers costs and schedules for improvements to its water system.

## 6.6. Humboldt Community Services District USAs & WSAs

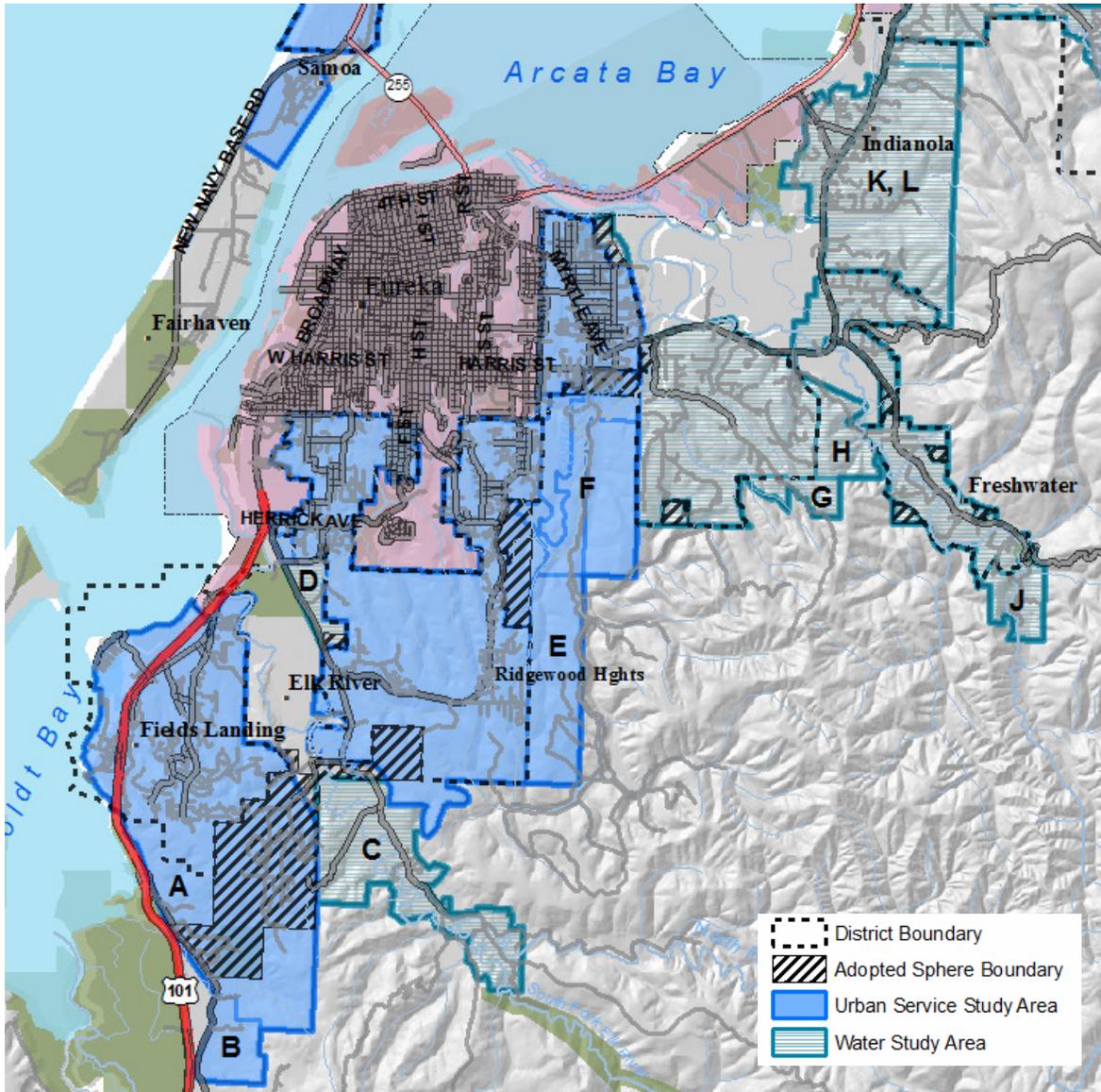
HCSD was declared formed in September of 1952 after a successful special election was held. The District is an independent multi-purpose special district organized to provide water, wastewater, and streetlight services pursuant to Section 61000 and following of the California Government Code. Formation of the District was prompted by an unmet need for urban type services in the rapidly growing "suburban" areas surrounding the City of Eureka. Because the desired services could not be obtained from the City, district formation was the only means available for providing those services necessary for the maintenance of existing and developing residential and commercial areas.

HCSD is located in the Humboldt Bay area and serves the unincorporated areas of the County surrounding the City of Eureka. The District extends from the Freshwater Valley in the north nearly to College of the Redwoods in the south. Humboldt Bay and the City of Eureka form the districts western boundary and the eastern edge of the Freshwater Creek valley forms the eastern boundary. Included within or adjacent to the boundaries of the district are the following USAs and WSAs, each of which will be analyzed in detail below:

- Freshwater WSA
- Humboldt Hill USA
- Indianola WSA
- Myrtle town USA & WSA
- South Eureka USA & WSA

HCSD has requested that this General Plan Update support its request for expansion of the district SOI and boundaries (collectively referred to SOI expansion areas). The County has agreed to evaluate these areas as part of the General Plan Update. These SOI expansion areas are referred to as areas A through L (see Figure 6 30. HCSD Proposed Sphere of Influence Expansion Areas on page 6-131). This report includes information regarding the SOI expansion areas in each of the HCSD Urban Study Areas. Additional information regarding district boundaries and spheres of influence can be found in Section 1.5, LAFCo and Service Provider Boundaries.

Figure 6-24. HCSD Proposed Sphere of Influence Expansion Areas.



HCSD has stated that its request for SOI expansion is based on specific and varying reasons. HCSD water infrastructure is located within some of the SOI expansion areas, and in some cases homes outside the district are provided HCSD water service. The inclusion of Areas A, D, G, and H would eliminate pockets adjacent to HCSD, or what HCSD refers to as “island” areas, and result in a contiguous service area with logical SOI boundaries, as recommended by LAFCO law. These SOI expansion areas are adjacent to both existing district boundaries and the HCSD SOI. Upon SOI expansion and annexation, Area H would connect the HCSD Freshwater service area and the rest of the district and eliminate a large island area.

Areas C, J, and L have water quality problems and its residents have requested public water service. Areas E and F are adjacent to both the HCSD service area and urban service boundary, currently contain HCSD facilities and could support additional long term development. Area B has been withdrawn for SOI consideration per County request.

The following is a brief description of the proposed HCSD SOI expansion areas:

**Table 6-30. HCSD Proposed Sphere of Influence Expansion Areas.**

Area	Name	Description	Existing HCSD Service in Area	HCSD Reason for Request
A	CR North	Pocket area between CR (existing SOI) and southern HCSD boundary near Fields Landing	Contains HCSD water main serving CR.	HCSD refers to area as "island"
B	CR South	Withdrawn by HCSD		
C	Elk River	Areas along Elk River Road south of Berta Road to Headwaters trailhead	No existing facilities within area	HCSD indicates that landowners have requested municipal water due to public health concerns
D	Myers Avenue	Pocket area along east side of Elk River Road between Herrick Avenue and Westgate Road	Contains HCSD water mains located within area	HCSD refers to area as "island"
E	Ryan Slough South	Timberland area east of Mid McKay Tract	Contains HCSD water tank and supply mains	To allow for long-term infrastructure planning
F	Ryan Slough North	Timberland area east of North McKay Tract		To allow for long-term infrastructure planning and a proposed HCSD lift station and collection facilities serving existing SOI area
G	Cummings Road	Area containing Cummins Road Landfill	Contains HCSD water mains and tanks located within area and homes receiving service	HCSD refers to area as "island"
H	Pigeon Point Road	Area adjacent to existing HCSD boundaries surrounding Felt Road	Contains HCSD water mains located within area and homes receiving service	HCSD refers to area as "island"
J	Pacific Lumber Camp Road	Area adjacent to existing HCSD, south of Freshwater Valley		HCSD indicates that landowners have requested public water

Area	Name	Description	Existing HCSD Service in Area	HCSD Reason for Request
K. L	Indianola	Area primarily on the east side of Myrtle Avenue between the northern edge of the HCSD SOI (Redmond Road) and the Indianola Cutoff	No existing HCSD facilities within area (City of Eureka facilities within area)	HCSD indicates that landowners have requested municipal water due to public health concerns

### 6.6.1. Freshwater WSA

The Freshwater Valley was originally served water by private, individual wells and several private water companies. In 1992, the residents requested that HCSD annex this area and create the Freshwater Assessment District to provide high quality public water to correct a long-standing water quality problem. A map showing the Freshwater WSA is attached as Figure 6-18. The Freshwater WSA is located within a valley east of Humboldt Bay. The Freshwater WSA also includes the Mitchell Heights and Redmond Road areas. The Freshwater WSA has 3,568 total acres, of which 1,008 acres are underdeveloped and/or vacant parcels. Of this total acreage, 1,024 acres within the WSA are developable. With respect to development potential, the Freshwater WSA has both underdeveloped and vacant parcels that may be appropriate for further development and subject to the Freshwater Community Plan, which was last updated in May 1985. The Coastal Zone portions of the WSA are subject to the Humboldt Bay Area Plan. Existing zoning restrictions and lack of sewer service restrict the development potential of this area. HCSD reports that fewer County building permits have been issued since receiving public water than previous to the Assessment District Formation.

The County estimates there were 803 housing units within the Freshwater WSA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Freshwater WSA could have between 887 and 1,316 total housing units by 2025. According to **Table 1-6**, the high projected total build-out estimate for total development potential within the Freshwater WSA, which takes into consideration physical and zoning constraints, is 1,138. Therefore, the high growth rate projection for the WSA is in excess of what the land can bear.

The high estimate for total development potential of 1,138 housing units in the WSA was used for infrastructure assessment and recommendations. This represents 335 new housing units within the Freshwater WSA or 2.9% of the total new housing units in the District.

Most of the Freshwater WSA is within the boundaries or SOI of the HCSD, with the following exceptions:

**Cummins Road (Areas G).** HCSD has requested that the Cummins Road landfill area be incorporated into the district SOI and boundaries. HCSD currently operates and maintains distribution and storage facilities in this area that were installed to correct public health problems caused by the landfill.

**Pigeon Point Road (Areas H).** HCSD has requested that the Pigeon Point Road area be included within the HCSD SOI and considered for annexation. The ultimate annexation of this area would connect the island area formed by the Freshwater Valley area and provide for more logical boundaries. HCSD operates and maintains a distribution system in this area that serves several properties. In addition, the annexation of this area would allow HCSD to plan for and install a

looped water distribution system serving the Freshwater area improving fire flow capacity and providing system redundancy.

**Pacific Lumber Camp Road (Area J)** - The Pacific Lumber Camp Road area is outside the current district SOI and boundaries, and residents have requested that the HCSD SOI and boundaries, as well as the Freshwater Assessment District be extended to include this area because of water quality problems similar to Freshwater.

### Findings

HCSD's water system in Freshwater is in good condition overall. There are no major infrastructure deficiencies associated with the existing system, as it was constructed in 1992. The Freshwater WSA could receive up to 335 new housing units before reaching build-out conditions. To the extent that development occurs where existing service is provided, no major improvements will be needed. However, where development is not adjacent to an existing water main, an extension of service will be needed.

The District has received requests from some residents on Pacific Lumber Camp Road to extend water service to their residences, which are located in the WSA. It is recommended that the District be allowed to expand its SOI to include the Lumber Camp area to improve the health, safety and water quality in this area.

HCSD operates water system infrastructure within the Cummings Road (Area G) and Pigeon Point Road (Area H) areas. It is recommended that HCSD be allowed to expand its SOI to incorporate these areas so that all HCSD facilities are located within its SOI.

### 6.6.2. Humboldt Hill USA

Most of the Humboldt Hill USA was added to HCSD boundaries in the 1980's with the purchase of the Pialorsi Private Water System and of the consolidation with County Service Area 3 (CSA 3) Sewer System, which was established in 1972 through the merger of three sanitation districts serving Fields Landing, King Salmon, and Humboldt Hill.

A map showing the Humboldt Hill USA is attached as Figure 6-5. The Humboldt Hill USA represents some of the greatest development potential within unincorporated Humboldt County. The Humboldt Hill USA has 3,967 total acres, of which 1,937 acres are underdeveloped and/or vacant parcels. Of this total acreage, 1,224 acres within the USA are developable. With respect to development potential, the majority of the Humboldt Hill USA has a significant amount of both underdeveloped and vacant parcels. The area's land use guidelines and development potential are covered in the Eureka Community Plan, and the Humboldt Bay Area Plan, both last updated in April 1995.

The County estimates there were 1,791 housing units within the Humboldt Hill USA in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Humboldt Hill USA could have between 1,979 and 2,935 total housing units by 2025. According to **Table 1-6**, The high projected build-out estimate for total development potential within the Humboldt Hill USA, which takes into consideration physical and zoning constraints, is 3,861. Therefore, the growth estimates are within the range of what the land can bear, and the Humboldt Hill USA has additional development potential beyond the 20-year planning horizon.

The high build-out estimate for total development potential of 3,861 housing units in the USA was used for infrastructure assessment and recommendations. This represents 2,070 new housing units within the Humboldt Hill USA or 18% of the total potential new housing units in the District.

Overall, there is potential for an estimated 11,602 new housing units within the Humboldt CSD service area.

Following the purchase of the Pialorsi Water System, the District drilled three municipal water wells to further serve the Humboldt Hill USA. Reservoirs serving Humboldt Hill include the 1.0 MG Blue Spruce tank and the 0.5 MG Donna Drive tank, for a total storage capacity of 1.5 MG.

Water service within the Humboldt Hill USA is generally very good. The District has an ongoing program for upsizing undersized water mains installed by the Pialorsi Water Company to improve fire protection. The Humboldt Hill study area's main water source is the District's wells. Current peak day demands within the study area are estimated at 40% of the well's total capacity.

Most of the Humboldt Hill USA is within the boundaries of HCSD. Two areas, identified by the HCSD as Area A (CR North) and the Area B (CR South), are not located within the HCSD SOI. The district has requested that LAFCO consider adding Area A upon adoption of the General Plan Update, and has withdrawn Area B from consideration.

**College of the Redwoods (Area A).** College of the Redwoods is within the HCSD SOI and currently receives public water. The area to the north of College of the Redwoods has requested public water. Area A is an "island," or pocket, area north of the CR campus and bordering the existing water main.

### Findings

HCSD's water system in Humboldt Hill area is in fair to good condition. The only major deficiency associated with the existing system serving the existing development on Humboldt Hill is an aging distribution system that was purchased from a private water system and is in need of repair. HCSD anticipates adding an additional 1.0 Million gallons of water storage to support planned development, to provide fire protection and to serve the higher elevation zones in the Humboldt Hill area. Additionally, the Humboldt Hill USA could receive up to an additional 2,070 units before reaching build-out conditions. Humboldt CSD will need to expand its water system infrastructure to serve this additional growth. Humboldt CSD has made improvements to the system wells and reservoirs since it purchased this system in the early 1980's.

The District has received a request from some residents within Area A to extend water service to their residences, and the water main providing service to CR passes through this area. It is recommended that this SOI expansion be allowed to improve the health, safety and water quality of this area.

### 6.6.3. Indianola WSA

The Indianola WSA (Area K & L) is primarily served by individual wells. A portion of the Indianola WSA (the Walker Point subdivision) is located within the City of Eureka SOI. Aside from the City of Eureka SOI area described above, the Indianola WSA is not within the City of Eureka, Arcata, or HCSD boundaries or SOI.

A map showing the Indianola WSA is attached as Figure 6-18. The WSA encompasses the community of Indianola, located just east of Humboldt Bay along Old Arcata Road between Arcata and Eureka, CA. The Indianola WSA has 1,916 total acres, of which 1,269 acres are underdeveloped and/or vacant parcels. Of this total acreage, 835 acres within the WSA are developable. With respect to development potential, the Indianola WSA contains mostly underdeveloped parcels with some vacant parcels that could see further residential

development. The area's land use guidelines and development potential are covered in the Humboldt Bay Area Plan.

There is currently no authorized provider of municipal drinking water in the Indianola area. The study area relies almost exclusively on private water sources with poor water quality and quantity. The City of Eureka water transmission line from HBMWD passes by the Indianola area and the City boundaries extend north east along US 101 to the edge of the Indianola WSA boundary. The City of Eureka has a number of retail water customers in this area including the Humboldt Area Foundation and provides a limited network of fire hydrants. Residents in Indianola have stated that existing private wells provide poor water quality and have requested that HCSD or the City of Eureka extend service to the study area.

The Indianola area is located outside the urban limit line established in the HBAP. An amendment to the Humboldt Bay Area Plan (HBAP) to extend the urban limit line may be required for this to occur. The urban limit line will have to be extended to include the Indianola WSA if either HCSD or the City of Eureka is to serve the area. Since Indianola WSA is a rural residential area, modifications to the urban limit line may only be made in conformance with Section 3.22 B of the HBAP. It is recommended that this extension of service be allowed to improve water service within the study area.

The Indianola WSA could receive up to 162 new housing units before reaching build-out conditions. Therefore, in addition to extending service to serve existing housing units, the new system would have to be expanded to serve this additional growth.

### **Summary of Required Improvements**

Because the Indianola WSA is not located within the boundaries of either the City of Eureka or HCSD and limited infrastructure is located within the WSA, a separate assessment of required infrastructure to provide service to this area was made. The following table summarizes the infrastructure assessment for the Indianola WSA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the WSA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

### **Findings**

New infrastructure would need to be installed to provide service to the Indianola WSA. See Table 6-32 below for an estimate of probable cost for extending service. It is recommended that an SOI expansion and extension of service to the Indianola Area's K & L be allowed to improve the health, safety, and water quality service within the study area.

**Table 6-31. Water system infrastructure assessment for the Indianola WSA.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Houses Needing Service	516
Storage Capacity	0
Estimated Usage Rate (gpd/connection)	629 (HCSD)
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Install storage – 0.444 MGD <sup>1</sup></i>	\$888,000
<i>Install distribution piping – 3 miles <sup>2</sup></i>	\$1,584,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$2,472,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$4,791</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)</b>	<b>\$25.61</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	99
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Install storage – 0.062 MGD <sup>3</sup></i>	\$124,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$124,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$1,253</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$2,596,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$4,221</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$22.56</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	162
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Install storage – 0.102 MGD <sup>3</sup></i>	\$204,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$204,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$1,259</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$2,676,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$3,947</b>
<b>Estimated Financing Cost per Connection (\$/Month)</b>	<b>\$21.10</b>

NOTES: <sup>1</sup> Additional storage requirements are based on 1 day of estimated maximum day use using existing HCSD usage rates (629 gpd/connection x 516 connections = 0.324 MG) plus minimum fire storage of 120,000 gallons.

<sup>2</sup> Estimated length of distribution system required to serve existing residences. Distribution requirements for future development are not estimated at this planning level, and are assumed to be covered by the developer(s).

<sup>3</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 629gpd/connection).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for correcting existing deficiencies would likely come in the form of a low interest loan, like a State Revolving Fund loan which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$2.472 million loan would amount to approximately \$159,000 per year. With 516 potential existing ratepayers, monthly bills to cover the above infrastructure would be approximately \$26 per month to fund this loan. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

#### **6.6.4. Myrtlestown USA & WSA**

A map showing the Myrtlestown USA and WSA is attached as Figure 6-5. The Myrtlestown USA represents one of the larger development potentials within the County. The Myrtlestown USA is located just east of the City of Eureka along Myrtle Avenue. The WSA is located on the northeastern corner of the USA and borders the Eureka Slough on the north.

The Myrtlestown USA has 830 total acres, of which 278 acres are underdeveloped and/or vacant parcels. Of this total acreage, 249 acres within the USA are developable. The Myrtlestown WSA has 61 total acres, of which 18 acres are underdeveloped and/or vacant parcels. Of this total acreage, 16 acres within the WSA are developable. With respect to development potential, the majority of the Myrtlestown USA has a significant amount of both underdeveloped and vacant parcels. The Myrtlestown WSA consists of mainly underdeveloped parcels. The area's land use guidelines and development potential are covered in the Eureka Community Plan, which was last updated on April 25, 1995.

The Myrtlestown study area contains both a USA and WSA. The County estimates there were 1,760 and 4 housing units within the Myrtlestown USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the Myrtlestown USA could have between 1,945 and 2,884 total housing units by 2025, while the Myrtlestown WSA could have between 4 and 7 total housing units by 2025. According to **Table 1-6**, the high projected build-out estimates for total development potential within the Myrtlestown USA and WSA, which takes into consideration physical and zoning constraints, are 2,781 and 85, respectively. Therefore, the growth projections for each study area are within the range of what the land can bear.

The high build-out estimates for total development potential of 2,781 and 85 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 1,102 new housing units within the Myrtlestown USA or 9.5% of total new housing units in the District.

#### **Findings**

Myrtlestown's water system is in good condition overall. There are no major infrastructure deficiencies associated with the existing system. HCSD is currently replacing some older steel pipe in the distribution system. The Myrtlestown USA and WSA could receive up to 1,102 new housing units before reaching build-out conditions. Humboldt CSD will need to expand its water system infrastructure to serve this additional growth.

#### **6.6.5. South Eureka USA & WSA**

A map showing the South Eureka USA and WSA is attached as Figure 6-5. The South Eureka USA, containing both the Cutten and Ridgewood areas, represents one of the greatest development potentials within the County. The South Eureka WSA is located south of the South Eureka USA and east of the Humboldt Hill USA, along Elk River Road.

The South Eureka USA has 6,030 total acres, of which 3,207 acres are underdeveloped and/or vacant parcels. Of this total acreage, 2,279 acres within the USA are developable. The South Eureka WSA has 1,199 total acres, of which 651 acres are underdeveloped and/or vacant parcels. Of this total acreage, 175 acres within the WSA are developable. With respect to development potential, both the South Eureka USA and WSA have a significant amount of both underdeveloped and vacant parcels. The South Eureka USA and WSA represented approximately 49% of total housing units within the HCSD service area. The area's land use

guidelines and development potential are covered in the Eureka Community Plan, which was last updated on April 25, 1995.

The County estimates there were 4,254 and 106 housing units within the South Eureka USA and WSA, respectively in 2005. Based on the County's housing growth projections of between 0.5% and 2.5%, the South Eureka USA could have between 4,700 and 6,971 total housing units by 2025, while the South Eureka WSA could have between 117 and 174 total housing units by 2025. According to **Table 1-6**, the high projected build-out estimates for total development potential within the USA and WSA, which takes into consideration physical and zoning constraints, are 12,302 and 153, respectively. Therefore, although the growth projections for the South Eureka USA are within the range of what the land can bear, the high growth rate projections for the WSA are in excess of what the land can bear. The WSA would reach build-out conditions at a slower growth rate of 1.85% over the next twenty years.

The high estimates for total development potential of 12,302 and 153 housing units in the USA and WSA were used for infrastructure assessment and recommendations. This represents a combined 8,095 new housing units within the South Eureka USA or 70% of the total new housing units in the District.

Most of the South Eureka WSA is within the boundaries or SOI of the HCSD, with the following exceptions:

**Elk River Valley (Area C)** Similar to the Freshwater Valley, the Elk River Valley includes an enclave of homes that experience poor water quality and that have requested public water. Currently the Elk River residents rely on sub-standard private wells or have their storage tanks filled by trucks hauling potable water. This area is also considered an "island" area by HCSD, separating the non-contiguous District areas of Humboldt Hill and Ridgewood.

**Meyers Avenue (Area D)** Residents along Elk River Road, near Meyers Avenue, are adjacent to but not within the HCSD SOI or boundary but currently receive public water for agricultural and domestic purposes from HCSD. In addition, HCSD water supply mains are located within this area.

**Ryan Slough South (Area E)** The Ryan Slough South area is located along the eastern edge of the district and SOI boundary between the Ridgewood Drive area and the HCSD district office. This area contains an HCSD water tank and other infrastructure and HCSD intends to include this area in future infrastructure planning.

**Ryan Slough North (Area F)** The Ryan Slough North area is located along the eastern edge of the district between the HCSD district office and the SOI area adjacent to the Redwood Acres Fairgrounds, of the McKay Tract. HCSD plans to install HCSD lift stations and collection facilities in this area to serve the existing SOI and HCSD intends to include this area in future infrastructure planning.

## Findings

HCSD's South Eureka's water system is in good condition overall. There are no major infrastructure deficiencies associated with the existing system. Some older steel pipe in the distribution system is currently being replaced and additional water capacity storage added to support planned growth and improve fire protection. The South Eureka USA and WSA could receive up to 8,095 new housing units before reaching build-out conditions. HCSD will need to expand its water system infrastructure to serve this additional growth.

It is recommended that the District expand its SOI to include the Elk River Valley (Area C) to improve the health, safety and water quality of the area. In addition, it is recommended that HCSD expand its SOI to include Meyers Avenue (Area D) which is currently receiving public water, to eliminate "island" or pocket areas and to establish logical boundaries.

Areas E and F may not be required to support planned growth during this planning period. However, it is recommended that the Ryan Slough North (Area F) and South (Area E) area be included within the HCSD SOI to allow for future infrastructure planning and to bring district infrastructure into its SOI.

### **6.6.6. Humboldt Community Services District Infrastructure Assessment**

#### **Existing Capacity**

The HCSD's water system is not limited by either source or treatment capacity with respect to its availability of connections. HBMWD has sufficient water supply to meet District demands, and the District has extensive available capacity within District wells.

#### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for all study areas served by Humboldt CSD, including the Humboldt Hill USA, Myrtle town USA and WSA, South Eureka USA and WSA, and Freshwater WSA. As noted above, the Indianola WSA is located outside the HCSD service area and its infrastructure assessment is presented above. Due to the interconnectedness of the water system, the study areas could not be assessed individually and were instead assessed collectively. The following table addresses the District's infrastructure needs for existing development and for build-out conditions.

**Table 6-32. Water system infrastructure assessment for the HCSD service area, including Humboldt Hill, Myrtle town, South Eureka, and Freshwater.**

<b>WATER SYSTEM STATISTICS</b>	
# of Existing Connections <sup>1</sup>	7,494
# of Available Connections <sup>2</sup>	---
Source Capacity (MGD)	Not limiting (HBMWD + wells)
Storage Capacity (MG)	4.785
Treatment Capacity (MGD)	Not required
Peak Day Use (MGD)	4.71
Usage Rate (gpd/connection)	629
<b>CORRECTION OF EXISTING DEFICIENCIES</b>	
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Additional storage –1.095 MG <sup>3</sup></i>	\$2,190,000
<i>Upgrade distribution system –2 miles <sup>4</sup></i>	\$1,056,000
<b>Estimated Cost for Existing Deficiencies (\$)</b>	<b>\$3,246,000</b>
<b>Estimated Cost per Existing Connection (\$)</b>	<b>\$433</b>
<b>Estimated Financing Cost per Existing Connection (\$/Month)<sup>7</sup></b>	<b>\$2.32</b>
<b>LOW BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	4,314
Proposed Infrastructure Upgrades <sup>6</sup>	Estimated Cost (\$)
<i>Additional storage – 2.711 MG <sup>5</sup></i>	\$5,422,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$5,422,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$1,257</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$8,668,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$734</b>
<b>Estimated Financing Cost per Connection (\$/Month)<sup>7</sup></b>	<b>\$3.92</b>
<b>HIGH BUILD-OUT ESTIMATE</b>	
# of Projected New Connections	11,602
Proposed Infrastructure Upgrades <sup>6</sup>	Estimated Cost (\$)
<i>Additional storage – 7.292 MG <sup>5</sup></i>	\$14,584,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$14,584,000</b>
<b>Estimated Cost per New Connection (\$)</b>	<b>\$1,257</b>
<b>Combined Cost for Build-Out and Existing Deficiencies (\$)</b>	<b>\$17,830,000</b>
<b>Estimated Cost per Connection (\$)</b>	<b>\$934</b>
<b>Estimated Financing Cost per Connection (\$/Month)<sup>7</sup></b>	<b>\$4.99</b>

NOTES: <sup>1</sup> The number of connections shown is for the entire Humboldt CSD service area and includes Humboldt Hill USA, Myrtle town USA and WSA, South Eureka USA and WSA, and Freshwater WSA.

<sup>2</sup> There is sufficient source supply from HBMWD and the wells to serve all development potential within the study areas.

<sup>3</sup> Additional storage requirements are based on information provided by HCSD.

<sup>4</sup> distribution system upgrade specifications based on information provided by HCSD.

<sup>5</sup> Additional storage requirements are based on 1 day of estimated maximum day use for new connections (# of projected new connections x 629 gpd/connection).

<sup>6</sup> Above costs do not include improvements associated with fluoridation, HBMWD Somoa Peninsula Techite Line Replacement or City of Eureka Martin Slough project, nor Elk River Wastewater Treatment Plant expansion.

<sup>7</sup> Costs and connection fees shown are provided for planning purposes and do not constitute a basis for HCSD connection fee implementation.

Humboldt CSD has approximately \$1.5 million in water reserves that could contribute to correcting existing deficiencies in the water system. According to the above table, approximately \$1.75 million in additional funding will be required to address existing deficiencies.

This funding would likely come in the form of a low interest loan, like a State Revolving Fund loan, which currently has loan terms of 20 years at 2.5% interest. At this rate, annual payments for a \$1.75 million loan would amount to approximately \$112,000 per year. With 7,494 existing ratepayers, monthly bills would have to be increased by approximately \$1.25. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections should buy into the existing infrastructure through connection fees. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

### **System Standards**

HCSD's water system is a public water system, and as such must be operated to meet the requirements of the State of California. See Section 6.2 for additional information regarding system standards.

### **Fiscal Condition/Capital Replacement Program**

According to HCSD records, the water system is operated on an annual budget of approximately \$2.8 million. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, loans, and other sources. Replacement or depreciation funds are not accumulated through revenues. The District's latest Capital Improvement Plan was developed in 2007, and they currently have approximately \$3 million in water and wastewater reserves.

### **Water Demand**

According to 2005/2006 HBMWD records, HCSD's average daily use was 1.253 MGD and peak daily use was 2.32 MGD. The District purchased over 479 million gallons of HBMWD water in fiscal year 2005/2006 direct from HBMWD. However, HBMWD water represents only part of HCSD's water supply.

According to the 2007 HCSD records, they produced approximately 914 million gallons of water for customers in 2006 (257.2 MG from wells, and 659.9 from HBMWD either direct from HBMWD or through the City of Eureka). Therefore, average daily use is estimated at 2.53 MGD, and peak daily use estimated at 4.71 MGD (utilizing the HBMWD peaking factor from above – 1.86). The District has approximately 7,494 existing connections, of which 97% are residential connections, and does not retail water to any other Districts.

### **Water Supply, Treatment, Distribution and Storage**

HCSD receives approximately 75% of their water from HBMWD and the City of Eureka. HCSD also maintains three water supply wells (two active and one active backup) that supplement their water supply, with a rated capacity of 1,580 gpm (2.28 MGD). HCSD's active connection with the City of Eureka has a capacity of 800 gpm, or 1.15 MGD. Their contract with the HBMWD allows for a peak rate allocation of 2.9 MGD. Therefore, the combined source capacity is estimated at 6.33 MGD.

Unlike the other USAs and WSAs within the HCSD service area, the Humboldt Hill USA's water system is served almost exclusively by HCSD well water sources, although HBMWD water can also be supplied to this part of the system. Reservoirs serving Humboldt Hill include the 1.0 MG Blue Spruce tank and the 0.5 MG Donne Drive tank, for a total storage capacity of 1.5 MG.

HCSD's distribution system extends from Freshwater in the north to College of the Redwoods in the south and contains approximately 125 miles of pipe. The District has approximately 5.0 MG of storage capacity within ten storage tanks ranging in size between 0.12 MG and 1.0 MG. The District serves over fourteen pressure zones. Water quality is representative of HBMWD's excellent water source and meets or exceeds State standards.

### **Condition Assessment**

**Overview.** Water service within HCSD is generally very good. The District has an ongoing program for replacing some old steel water line of various sizes and anticipates that all of it will be replaced by 2012. Peak daily use of HBMWD water for the District (2.32 MGD in 2005/2006) was below their peak rate allocation of 2.90 MGD set in contract with HBMWD on July 1, 2006. Overall peak daily use is at approximately 71% of existing source capacity. The Humboldt Hill study area's main water source is the District's wells. Current peak day demands within the Humboldt Hill Urban Study Area are estimated at 40% of total capacity HCSD's well's serving that area.

**Current Deficiencies.** There are no significant deficiencies within HCSD's water system although some storage and fire flow improvements are anticipated.

**Underserved Areas.** Areas within the boundaries of HCSD receive water service or are authorized to be served. Several areas (Areas A, D, G & H) currently receive HCSD public water or have HCSD facilities within them, but are outside of the HCSD SOI or service boundary. These areas should be included within an expanded SOI. Portions of the HCSD USAs or WSAs within or adjacent to the HCSD SOI do not currently receive service. Such areas that are currently developed with residential uses include Lumber Camp Road in Freshwater, the Indianola area (portions of the Indianola area receive service from the City of Eureka), and the Elk River area. Other new development areas such as Green Diamond timber land (also known as the Ryan Slough (Areas E & F both within the Martin Slough and Ryan Slough drainages) are located within or adjacent to the HCSD SOI and currently do not receive water service.

### **Proposed Improvements**

**System Upgrades.** No major system upgrades are planned for HCSD service area in the near future aside from routine maintenance, the ongoing steel water line replacement project or water storage tank additions to support planned development. Replacement of HBMWD's Techite transmission line on the Peninsula will ultimately need replacement to ensure a reliable water supply not subject to seismic failure. As future development occurs, the District is prepared to install additional storage and fire flow improvements.

**Future Expansion.** The District is interested in expanding services to new developments as they occur. HCSD has requested that the areas identified above as College of the Redwoods (Area A), Elk River Valley (Area C), Meyers Avenue (Area D), Ryan Slough (Area E & F), Cummings Road (Area G), Pigeon Point Road (Area H), Pacific Lumber Camp Road (Area J), and Indianola (Area K & L) be included within its SOI upon completion of the General Plan Update. It is recommended that HCSD expand its SOI to be able to plan for and supply public service to these areas based on health, safety and fire protection requirements, and consistent with the General Plan as approved by the Board of Supervisors.

**Cost and Schedule of Improvements.** The District developed a five-year Capital Improvement Plan in 2007 that covers costs and schedules for improvements to its water system. The majority of the CIP focuses on steel water main replacement, but also focuses on pumping facility upgrades. Proposed improvements are estimated to cost approximately \$3 million over the next five years.

## 6.7. Policy Recommendations

This technical report presents a basis for describing and assessing water services being provided in Humboldt County. As documented in this report, in many cases, service providers need to make considerable improvements to their water infrastructure to provide acceptable levels of service. The service providers will need significant resources and revenue to appropriately respond to this need, and the County may need to provide a supporting role to ensure these service providers succeed in accomplishing this.

This technical report will be used to guide development of the Community Infrastructure and Services Element and the recommended policies therein.

### **ISSUES TO BE ADDRESSED IN THE COMMUNITY INFRASTRUCTURE AND SERVICES ELEMENT**

The Community Infrastructure and Services Element will include goals, policies and programs for the following issues;

**Ability to Function.** Many of the service providers within the County lack the technical, managerial, and financial capacity to continue providing acceptable levels of service given aging infrastructure, population growth, and an increasingly complex regulatory environment. The policy document will recommend policies and programs the County can implement to assist and enable these service providers.

**Rates.** Most service providers within the County have historically charged low rates that generally do not adequately cover the costs of providing water service. This practice has led to degraded systems, deteriorating levels of service, and a lack of reserves to address and improve the situation. The Element will recommend policies and programs the County can implement to get the service providers to conduct rate studies and reduce costs of providing services to reduce "rate shock" within the County.

**Funding of Infrastructure.** The most significant obstacle when planning capital improvements for both rehabilitation and construction of new infrastructure is funding. Many of the providers serve small communities with limited resources. Assistance from the County would likely help the agencies secure the needed funding. The Element will recommend policies and programs the County can implement to secure funding and assist service providers in developing competitive grant and loan applications.

# 7. Wastewater Systems

## 7.1. Introduction

Wastewater service in Humboldt County is provided by a variety of local agencies including City departments, Community Services Districts, and Sanitation Districts. There are two private wastewater service providers, the Pacific Lumber Company in Scotia and the Samoa Pacific Group in Samoa. Most rural areas within the County have on-site septic systems, which are regulated by the County through its Environmental Health Department. In areas of higher density where on-site septic systems are not feasible, services must be provided to collect, treat, and dispose of wastewater. Regulations governing both on-site disposal systems and community sewer systems are becoming more restrictive and complex with time.

This Section describes the potential for existing wastewater systems to accommodate future growth within the various USAs identified by the County. Existing demand and capacity, proposed and/or planned expansions, and potential constraints are described below. The infrastructure assessment within this Section draws from the information available within Table 1-5 and Table 1-6 in Section 1. Funding sources for wastewater systems are described in detail in Section 12.2.5.

## 7.2. System Standards

### 7.2.1. Sewage Treatment and Disposal Standards

Regulations surrounding disposal from publicly owned treatment works (POTWs) are becoming increasingly stringent in Humboldt County, as they are throughout the State of California. POTW's must be operated to meet the requirements of the Federal Clean Water Act and Amendments, and the Porter-Cologne Water Quality Control Act (California Water Code, Division 7). Treatment and discharge requirements are set forth in the National Pollutant Discharge Elimination System (NPDES), developed by the U.S. EPA and enforced in Humboldt County by the North Coast Regional Water Quality Control Board (RWQCB ). The RWQCB has adopted the North Coast Basin Plan which provides specific guidance on how the federal and state laws will be applied in Humboldt County. The goal of the Basin Plan is to provide a definitive program of actions designed to preserve and enhance water quality and to protect beneficial uses of water in the North Coast Region. The initial plan was adopted in 1971 and has been amended numerous times, with the most recent amendment in 1996.

Unfortunately, sewage treatment and disposal standards seem to change quite frequently, becoming more stringent and covering more constituents with each change. It is impossible to predict all of the changes in regulations that will occur during the next 20 years. Even when we know about proposed changes, we can only speculate as to how the regulations will be interpreted and their impacts on a particular POTW. With that framework, we think it is important to understand some of the main issues facing service providers and potential impacts. We are hopeful that this discussion will lead to a better understanding of these issues by the public and governing officials.

All dischargers with average daily flows greater than 1500 gallons per day must obtain a permit from the RWQCB. If the discharge is to a body of water, like a river, lake or ocean, then the permit falls under the NPDES program. If the discharge is solely to land then waste discharge

requirements (WDR) are issued. Both of these permits are effective for 5 years, after which time they must be renewed. Due to staffing constraints and other issues, a permit renewal may be delayed and the existing permit will remain in effect until a new permit is adopted. The permit renewal process can take a year or more and it is during this process that the RWQCB will often raise new issues that need to be addressed. Sometimes the request is simply to gather data that will then serve as a basis for new requirements that will be incorporated during the next renewal. The practical effect of this is that at any given point in time one discharger may have to deal with an issue while another one doesn't because its permit has not come up for renewal. In addition, the RWQCB will tend to focus on the larger dischargers before addressing the smaller ones.

The effective collection and treatment of wastewater is challenging, but the year-round disposal of treated effluent is really the major issue facing most POTWs. Many POTWs in the County are out of compliance with waste discharge requirements as set forth in the North Coast Basin Plan. Discharge requirements from the RWQCB to water bodies (to rivers, estuaries, or ocean outfall) during winter months specify a "dilution ratio," which requires a minimum ratio of flow in the receiving water body to discharge flow (usually 100 parts receiving water to one part treated effluent discharge). During summertime, when discharge is prohibited, treated effluent must be stored for future wintertime discharge, re-used for agricultural irrigation or other purposes, or discharged to a percolation pond that has no connection to streams or other water bodies.

The Mad and Eel River basins both have a discharge prohibition period from May 15 through September 30 each year, in which no disposal to these water bodies is allowed. Discharges to the Trinity River are currently prohibited year round and there are (currently) no discharges to either the Van Duzen or Klamath rivers or to Redwood Creek. Humboldt Bay and all estuaries within the County are also protected from any further discharges. What this means is that it will be very difficult, if not impossible to obtain approval for a future discharge to any of these bodies of water. Summertime disposal is also a major issue facing most dischargers in the County.

In addition to the difficulties posed by summertime disposal and the wintertime dilution ratio, discharge requirements, relating to the level of treatment and the constituents that are treated, during regular discharge periods are also becoming increasingly stringent. Nitrate and ammonia regulations will likely be the most difficult upcoming regulation for POTWs to comply with. The RWQCB expects to begin imposing nitrate and ammonia effluent limitations on discharge permits during the next round of permit renewals. Dischargers will likely be required to make significant changes to their treatment processes in order to comply with these new limitations. Nitrate and ammonia removal is difficult because additional treatment processes must be done that were not a part of existing designs, requiring additional energy costs or additional chemical costs. Currently, there is a movement by some of the dischargers in the southern portion of the region to fund a position at the RWQCB to develop an amendment to the Basin plan that would remove the nitrate issue. However, the outcome of this effort is unknown at this time.

Inflow and infiltration, I&I, is the flow of rainwater into a wastewater system from the surface (Inflow), through manholes covers and rainwater downspouts, or below the surface (infiltration) through cracks in the collection pipe or faulty joints. The degree to which a collection system is affected by I&I is depicted in its "peaking factor." The peaking factor is a comparison between the volume of flow in the wastewater collection system during average dry weather conditions and the volume of flow during peak wet weather conditions. Well performing collection systems have a peaking factor of three or less (peak wet weather flows are at most three times average dry weather flows). In Humboldt County, the McKinleyville Community Services District collection system has a peaking factor of approximately 2.1 (this peaking factor is based on data provided

by the McKinleyville CSD and is not directly correlated with peak event storm recurrence intervals or the duration) and many other systems in the County have peaking factors approaching 10. Aside from the collection system capacity system problems posed by I&I and the increased likelihood of sanitary sewer overflows (untreated wastewater reaching surface waters through manholes or overflowing wet wells at pump stations), the wastewater treatment plant will be required to treat rainwater to wastewater standards.

Another significant issue for systems that have an above average amount of I&I is the requirement that the POTW remove 85 percent of the biochemical oxygen demand (BOD) and total suspended solids (TSS). As I&I increases, the wastewater flowing into the plant becomes diluted and the treatment process needs to be more effective in order to remove 85 percent of BOD and TSS. Typically, the influent BOD and TSS is around 200 milligrams per liter (mg/l) in raw sewage and the treatment plant is designed to remove 85 percent, resulting in an effluent strength of 30 mg/l. When I&I is high, the influent BOD and TSS can be reduced to between 50 and 100 mg/l. So while the treatment plant should be able to meet the effluent limitation of 30 mg/l, the 85 percent removal criteria would require the effluent to be between 7.5 and 15 mg/l. To achieve these levels typically requires tertiary, instead of secondary treatment.

It should be noted that the requirement to maintain effluent quality by removing 85% of BOD and TSS is based on a 30-day average, rather than on a daily records where peak storm events would significantly affect a WWTP's ability to achieve removal requirements. However, average wet weather wastewater flows can be significantly higher than average dry weather flows and can cause dischargers to violate percent removal requirements.

With the exception of McKinleyville, Manila, Glendale and a few other systems, most collection systems have levels of I&I that can cause their POTWs to not be able to meet this limitation with their current WWTP. This chapter also provides more detailed information on each individual system.

Many of the POTWs also may have issues with meeting rules established by the US EPA and contained in the Code of Federal Regulations called "Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California," and known as the California Toxics Rule (CTR). A very limited amount of sampling has been done, and the RWQCB has performed reasonable potential analyses for most POTWs that have identified constituents in the wastewater that have a reasonable potential to exceed the limits set in the CTR. USEPA regulations require that water quality-based effluent limitations be established for constituents that cause or have a reasonable potential to cause or contribute to violations of a water quality objective. This determination must be made for priority pollutants for which water quality standards have been adopted in the CTR. In general, these are constituents that are not typically removed by a POTW, and the service providers will have to develop individual strategies for compliance. This can include, but is limited to, the use of source controls (limiting the toxin at the source, such as household or commercial use of chemicals, etc.) or applying for use of a mixing zone (getting credit for the dilution of toxins that occurs when the wastewater is discharged to the receiving water body). While compliance with the CTR is required by 2010, significant questions currently exist and it is unclear how many dischargers will comply with this unfunded mandate.

On-site sewage disposal regulations are set forth in Humboldt County's Sewage Disposal Regulations; last updated January 30, 1984. Although a minimum lot size requirement is not specified in the Sewage Disposal Regulations, minimum setback requirements are in effect and vary depending on whether the lot is on a public water system or an individual water system. The primary limitations in Humboldt County for siting of on-site disposal systems are restrictions relating

to poorly draining soils and high groundwater situations. Minimum depth requirements between the bottom of the leaching trench and the anticipated highest level of groundwater are determined according to the North Coast Regional Water Quality Control Board Policy on the Control of Water Quality with Respect to Individual Waste Treatment and Disposal Practices located in the North Coast Basin Plan. Minimum depth requirements are a function of silt and clay percentages within the soils; generally, a minimum of five feet separation is required. For soils having greater than 15 percent silt and clay, lesser depths to groundwater, to a minimum depth of two feet below the leaching trench, may be granted with a waiver or for alternative systems. Upcoming regulations based on AB 885, approved in August 2000, may do away with the two foot exception, requiring five foot minimum depth regardless of soil content. This would pose significant difficulties to siting on-site disposal systems in Humboldt County due to high groundwater levels prevalent throughout the county. Development in areas of the County not served by public water or sewer systems is often constrained by the individual sites ability to provide sufficient water and to properly treat and dispose of its sewage.

### **7.2.2. Development Standards**

All development within both unincorporated and incorporated areas within the County is subject to meeting minimum development standards for infrastructure. These minimum standards are detailed in the Humboldt County General Plan and standards set forth and adopted by the incorporated cities and many of the districts within the County. Most of the special districts have their own standards that must be met by any new development. Generally for annexations to be considered, infrastructure within the potential annexed area must meet the minimum standards of the City. For example, the Humboldt Community Services District requires all proposed service laterals and facilities that are to be dedicated to the district upon completion to meet the HCSD Water and Sewer Design and Construction Standards, as adopted by the District pursuant to Resolution 98-10. All service providers, whether they have adopted development standards or use the best available standards, will require that designs be submitted for approval prior to construction and that an inspection and acceptance by service provider staff occur.

### **7.2.3. Methodology for Estimating Costs**

#### **Unit Cost Estimates**

All infrastructure costs presented herein represent our opinion of the probable construction and soft costs (engineering, legal, administrative, etc.) in September 2007 dollars. The costs are "order of magnitude" costs, and actual costs will be higher or lower due to specific issues related to a particular project/site. Wastewater system infrastructure costs are unique to each study area and highly speculative depending on the outcomes of some regulatory changes looming large on the horizon, and therefore unit costs were not able to be applied as they were in the water system infrastructure assessments. For example, wastewater treatment costs will vary from study area to study area depending on what constituents are included in waste discharge requirements. Summertime disposal costs will vary largely depending on site-specific variables such as land availability, topography, soil characteristics, and potential for irrigation. For these reasons, wastewater infrastructure costs were not estimated on a unit-basis as was done in the water infrastructure assessment. Instead, background knowledge of the systems and engineering judgment regarding forthcoming and anticipated regulations were used to "guesstimate" as accurately as possible.

Costs related to existing deficiencies were also more difficult to separate out from costs associated with necessary future upgrades. Since collection system upgrades and treatment upgrades will be required by law as regulations change, these upgrades will benefit both existing and future development. Therefore, unit costs were developed based on total existing

and future units. Again, further studies will need to be performed by service providers to determine how to appropriate and distribute these costs over their existing and future ratepayer base in order to develop more accurate connection fees and rates needed to maintain and sustain systems well into the future.

### **Presentation of Estimates**

Total costs for correcting existing deficiencies, addressing changes in regulations, and constructing improvements to accommodate the Low and High development projections are estimated using the above methodology and are provided for each urban study area. Estimated costs are presented in table form along with system statistics such as the number of connections, available connections, and current system capacity. Costs are presented in the following manner: total estimated costs, costs per connection (total cost divided by the number of connections), and estimated financing cost per connection per month. The Low and High build-out costs are also added to the existing deficiencies in calculating estimated cost per connection and estimated financing cost per connection.

The estimated costs are based upon assumptions and the actual costs will be different. Funding for correcting existing deficiencies would likely come from grants and low interest loans, such as a State Revolving Fund loan which currently has loan terms of 20 years at 2.5 percent interest. In addition, we would expect actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

It should be noted that the estimated cost per connection does not represent a proposed connection fee and the estimated financing cost per connection per month does not represent a proposed change to rates. These costs calculations are only provided to indicate the magnitude of the estimated costs in relation to number of costumers. *Future connections should buy into the existing infrastructure through connection fees. These connection fees should be determined by the individual provider based on detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.*

Future rate studies should be conducted to determine the level of connection fees and usage charges needed to generate sufficient revenue to maintain an acceptable level of service and also capture sufficient replacement costs. These studies should also determine the appropriate methodology to allocate costs to future users for existing fire storage and an existing distribution system. These issues are not addressed at this planning level and are typically covered in master plans or project specific facilities plans prepared by each service provider.

## **7.3. HCSD and Eureka**

Areas served by HCSD have the greatest development potential within the county. Although these areas have the most potential with respect to vacant and underdeveloped parcels, some major infrastructure limitations exist to developing some of these areas with respect to water, sewer, and transportation. The following discussion addresses issues surrounding sewer limitations.

HCSD's ability to serve new connections with sewer is contingent upon the City of Eureka's treatment and disposal capacity and in some cases their sewer collection capacity as well. The

City and HCSD are under a contractual agreement to share capacity at the Elk River Wastewater Treatment Plant (WWTP) and to convey wastewater through several points of interconnection between HCSD's and Eureka's collection system in multiple locations. Unfortunately, portions of both HCSD's and Eureka's collection systems experience significant inflow and infiltration (I&I) and are near or at capacity in a number of locations during significant rain events. High levels of I&I at the Elk River WWTP result in reduced short-term BOD and TSS removal efficiency. Although extreme wet weather flows approach the design capacity of the WWTP, the plant is designed to treat all flows that the collection system conveys in its current configuration and with the current peaking factor.

According to the National Pollutant Discharge Elimination System (NPDES) permit issued by the North Coast Regional Water Quality Control Board (RWQCB), the facility is permitted for an average dry weather flow (ADWF) of 5.24 MGD, peak dry weather flow of 8.6 MGD, and a peak wet weather flow of 32 MGD. The City has indicated that the design capacity of the Elk River WWTP is 6.0 MGD ADWF. Average dry weather flows for the month of August has varied from 4.5 MGD (2002) to 4.8 MGD (2005), while winter maximum day flows totaled approximately 18 MGD (City of Eureka, 2006). However, historically peak wet weather flows have exceeded 30 MGD. The City is currently evaluating their WWTP and anticipates the WWTP infrastructure study being completed in 2008, at which time they will also begin their NPDES permit renewal process (Knight, 2007).

It should be noted that each unit process (pumps, pipes, tanks, etc.) within the Elk River WWTP may operate at different capacity levels. The Elk River WWTP is approaching capacity limitations in some of its unit processes. The Elk River WWTP infrastructure study is intended to identify hydraulic and process "bottlenecks" and propose cost effective improvements to increase capacity, rather than construct a total plant expansion. The City expects that this strategy will allow step-wise increases in WWTP capacity that keep pace with development over the next 20 years.

The City of Eureka is also working on reducing the levels of I&I in their collection system. The City of Eureka and HCSD are also cooperatively working on the Martin Slough Interceptor Project. The Martin Slough project is multi-purpose in function; reducing sewer overflows that degrade the environment, eliminate existing city and HCSD sewage lift stations (by conversion to gravity service), improve energy conservation, and provide capacity for planned development.

In conclusion, significant challenges exist for both the City of Eureka and HCSD related to their collection, treatment and disposal systems. Both agencies are actively working to correct current deficiencies and to provide capacity for future growth. These improvements will take time and additional funding to be completed and will need to be completed prior to any significant development occurring in areas served by HCSD. Areas such as Myrtle town, Ridgewood, and Cutten are limited by the City of Eureka's collection system capacity and the Elk River WWTP's capacity. Development in Humboldt Hill, when aggregated with the development potential of other HCSD USAs, is mainly limited by the Elk River WWTP's ability to handle increased flows.

### **7.3.1. Martin Slough Interceptor**

The City of Eureka is currently in the process of finalizing designs for its Martin Slough Interceptor (MSI) Project, which is aimed at improving wastewater collection within the Martin Slough basin. The intent of the project is to reduce demands on portions of the City's system that are overloaded and from time to time experience sanitary sewer overflows. The project will also greatly improve efficiencies within both the City's and HCSD's collection systems by eliminating as many as 16 existing lift stations, with associated energy and cost savings.

The MSI project boundaries incorporate areas within the City of Eureka that will gravity flow into the proposed interceptor, and portions of the unincorporated area surrounding Eureka that can utilize the interceptor based on proximity and topography and that are within the urban limit line established by the Eureka Community Plan and the Humboldt Bay Area Plan. The /Pinehill area and a portion of the Cutten area of the South Eureka USA are not within the MSI project boundaries. Wastewater within these areas drains to portions of the City of Eureka collection system other than the proposed MSI. Other portions of the South Eureka USA are located outside the Eureka Community Plan and the Humboldt Bay Area Plan urban limit line

**MSI Project Development Estimates.** The future housing units that can be accommodated by the MSI were projected by the City of Eureka as part of the MSI design (Project Boundary and Population Density Technical Memorandum, amended April 23, 2003). The City of Eureka based its development projections on the 1995 Eureka Community Plan land use designations (including specific policies regarding allowable density, density limitations, and urban expansion).

The City of Eureka assumed that 15 percent of total HCSD primary dwelling units would have 2<sup>nd</sup> dwelling units and that 20 percent of total City of Eureka primary dwelling units would have 2<sup>nd</sup> dwelling units. The City of Eureka also assumed that 2<sup>nd</sup> dwelling units would have fewer total occupants and would contribute 60 percent of the wastewater flow of primary dwelling units. Primary dwelling units are considered equivalent dwelling units (EDU) and 2<sup>nd</sup> dwelling units are assumed to equal 0.6 EDUs. The City of Eureka estimated that there are 94 non-residential EDUs in the HCSD portion of the Martin Slough basin and assumed that there would be no additional non-residential development.

The City of Eureka projected that the MSI would serve the following based on the Proposed Project:

**Table 7-1. Dwelling units associated with the proposed MSI project.**

Source	City of Eureka	HCSD	Total
Existing Residential Dwelling Units	1,345	2,839	4,184
Existing Non-residential Units	0	94	94
<i>Subtotal Existing Units</i>	<i>1,345</i>	<i>2,933</i>	<i>4,278</i>
Future New Primary Dwelling Units	440	3,900	4,340
Future New Secondary Dwelling Units	357	1,011	1,368
<b>Future New Secondary Dwelling Units EDUs</b>	<b>214</b>	<b>606</b>	<b>820</b>
Future Non-residential Units	0	0	0
<i>Subtotal New Units</i>	<i>797</i>	<i>4,911</i>	<i>5,708</i>
<b>Total Units Served</b>	<b>2,142</b>	<b>7,844</b>	<b>9,986</b>
<b>Total EDUs</b>	<b>1,999</b>	<b>7,440</b>	<b>9,439</b>

Source: Table 9-3, Martin Slough Interceptor Project Draft EIR, May, 2004 with EDUs added.

**MSI Project Comparison to South Eureka USA.** The High unit development projection for the South Eureka USA includes lands that are outside the Eureka Community Plan and Humboldt Bay Area Plan urban limit line and assumes that the residential development density of certain parcels in the South Eureka USA would be increased beyond current levels. As a result, total High unit development potential for the South Eureka USA will likely exceed the planned capacity of the proposed interceptor. As previously explained, the proposed MSI Project was designed for a

unit capacity based on the adopted in the County's 1995 Eureka Community Plan and the Humboldt Bay Area Plan. This design requirement fulfilled the criteria that the interceptor not be growth inducing. The MSI design capacity was based on typical existing wastewater flow volumes. Therefore, sewage capacity is not based on a specific number of housing units, but is limited to the MSI allocated flow volume. This flow volume limitation is stated in and made a part of all HCSD conditions of approval for major developments. HCSD wastewater flows into the City of Eureka collection system are measured by sewage flow metering stations. When each individual development reaches its allocated capacity volume, no further units are allowed. Conversely, if capacity still exists in the MSI, additional sewage connections may be allowed based on an evaluation by HCSD and the City of Eureka that additional development will not increase the incidence of sanitary sewer overflows.

The South Eureka USA includes developable areas that are not within the HCSD Boundary or SOI, primarily HCSD SOI expansion areas E and F. All other SOI requested expansion areas are not within the MSI service area and are considered Water Service Areas (WSA) only. To the extent that these areas are planned for development and wastewater flows from this area are beyond the capacity of the MSI, HCSD proposes the following infrastructure improvements:

1. The sewage lift station servicing the current proposed McKay Tract developments would be expanded.
2. A new pressure force main would be constructed from the McKay Tract Lift Station to the proposed Martin Slough Sewage Pump Station.
3. The Martin Slough Sewage Pump Station would be expanded in capacity.
4. A new (parallel) pressure sewer would be constructed from the MSI Pump Station to the Elk River WWTP.
5. The Elk River WWTP would be upgraded as required. The above improvements would be made part of each developments environmental approval process.
6. Areas E and F infrastructure improvements would be financed by the developer(s) requesting the service.

In summary, the MSI provides sewer service to areas currently planned for development, with provision for additional housing units if capacity exists. Development not part of the MSI Project and outside the present HCSD SOI can be served by a combination of separate MSI Lift Station upgrades and parallel sewer infrastructure improvements paid for by the new development that benefits.

## **7.4. Community Wastewater Systems**

The following sections introduce the County's USAs that either have existing community wastewater systems in place to serve their communities or have plans to develop community wastewater systems within the planning period considered herein. The sections provide a detailed discussion on development potential and wastewater infrastructure assessment for each study area. Any wastewater system infrastructure deficiencies will be identified along with plans for timing and financing of needed improvements.

Similar to the discussion of HCSD in Chapter 6, Water Systems, the USAs within or adjacent to HCSD are presented together in Section 7.5 of this Chapter, following the discussion of the wastewater systems located in the other USAs. The following USAs have been evaluated with respect to HCSD:

- Humboldt Hill USA

- Myrtle town USA
- South Eureka USA

### **7.4.1. Arcata USA**

There are a total of five areas within the City's sphere of influence that comprise the Arcata USA. A high build-out estimate for total development potential of 205 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.1 for a more detailed description of the USA and its development potential.

#### **7.4.1.1. Summary**

##### **Findings**

The City of Arcata's wastewater system is in fair condition overall, but has had increasing difficulties meeting its discharge requirements as set forth by the NCRWQCB in recent years. The City has been issued both an Administrative Civil Liability Order (ACLO) in 2006 and an Administrative Civil Liability Complaint (ACLC) in 2007 for effluent limit violations from its treatment and disposal system and for sanitary sewer overflows from its collection system. These legislations implementing minimum mandatory penalties have resulted in enforcement actions that have required the City to request changes in the NPDES permit and encourage the City to continue to implement system upgrades.

Peak wet weather flows of around 12 to 14 MGD have occurred in recent years, and the City is preparing to embark on a CIP to rehabilitate sewerlines, and manholes identified as structurally unsound or subject to inflow and infiltration (I&I). We anticipate that this will be an ongoing program and will need to be expanded to include replacement or rehabilitation of the sewer laterals that exist on private property.

The City's wastewater facilities are permitted to treat up to 2.3 MGD mean daily dry weather flow averaged over a period of one calendar month. Existing dry weather flows are currently 1.35 MGD. Therefore, the treatment facility is operating at approximately 59% of capacity and could accommodate approximately 4,439 additional residential connections based on dry weather flows.

##### **Existing Capacity**

Availability of connections within the City of Arcata wastewater system is not as straightforward as with the water system. According to the City's discharge permit, the system has an average dry weather design flow of 2.3 MGD. Considering the City's average dry weather flows are currently around 1.3 MGD, this would indicate the City is operating at 59% of capacity.

However, the City is currently having difficulty meeting their discharge requirements as evidenced by a recent ACLC and ACLO, which indicates the facilities' treatment capacity is being exceeded. Therefore, available capacity is estimated to be near zero until these problems are resolved. With improvements to the treatment system and reduction in I&I, the City's wastewater system could likely realize its full dry weather capacity, allowing for 4,439 additional connections.

##### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Arcata USA and addresses infrastructure needs for existing development served by the City of Arcata and for build-out

conditions. The existing capacity of the system includes connections within the City of Arcata as well.

**Table 7-2. Wastewater system infrastructure assessment for the Arcata USA.**

<b>WASTEWATER SYSTEM STATISTICS</b>	
# of Existing Connections	6,388
# of Available Connections <sup>1</sup>	4,439
Permitted Dry Weather Treatment Capacity (MGD)	2.3
Existing Dry Weather Flows (MGD)	1.3
Existing Peak Wet Weather Flows (MGD)	14
I&I Peaking Factor	10 – 11
<b>LOW AND HIGH BUILD-OUT ESTIMATES</b>	
# of Projected New Connections	2 – 205
# of Total Future Connections <sup>2</sup>	6,390 – 6,593
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Modifications to treatment system to improve short-circuiting <sup>3</sup></i>	\$2,000,000
<i>Flow control structure upgrades <sup>3</sup></i>	\$2,000,000
<i>Collection system I&amp;I upgrades <sup>3</sup></i>	\$15,000,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$19,000,000</b>
<b>Est. Cost per Existing Connection (\$)</b>	<b>\$2,974</b>
<b>Est. Financing Cost per Existing Connection (\$/Month)</b>	<b>\$15.90</b>
<b>Est. Range of Costs per Total Future Connection (\$)</b>	<b>\$2,882 - \$2,973</b>
<b>Est. Financing Cost per Total Future Connection (\$/Month)</b>	<b>\$15.41 - \$15.89</b>

NOTES: <sup>1</sup> The number of available connections was estimated based on the City's current ADWF being 59% of capacity as set forth in their NPDES permit. However, improvements to the system are needed, as the system is currently not meeting discharge requirements.

<sup>2</sup> This number does not include development within City limits.

<sup>3</sup> The City is in the process of completing a Capital Improvement Program. Infrastructure upgrades and expansion will be further detailed through this process.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$19,000,000 loan would amount to approximately \$1.22 million per year. With 6,388 existing connections, monthly bills would have to be increased by approximately \$16 per month to fund this loan. New development in the USA would not affect these monthly payments much since the development potential is not high, but future development within the City could further reduce this amount. In reality, we would expect the City to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

### **7.4.1.2. Wastewater System**

#### **Service Area Description**

Upon annexation, the Arcata USA is expected to receive wastewater service from the City of Arcata. The City also provides wastewater services to Fieldbrook Glendale Community Services District through contract.

#### **System Standards**

The City of Arcata's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The City's current waste discharge requirements are contained in RWQCB Order No. R1-2004-0036, NPDES Permit No. CA0022713. The City is currently under Administrative Civil Liability Order (ACLO) No. R1-2006-0054 and Administrative Civil Liability Complaint (ACLC) No. R1-2007-0064 (see the Condition Assessment section below for a description of the ACLO and ACLC).

#### **Fiscal Condition/Capital Replacement Program**

According to City records, they operate their wastewater system on an annual budget of approximately \$2.9 million. The majority of this income is from service charges, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The City will be developing a Capital Improvement Plan in 2008, and they currently have approximately \$230,000 in built-up reserves.

#### **Wastewater Flows**

Approximately 6,000 connections receive wastewater service within the City of Arcata, and the City additionally receives and treats wastewater from approximately 165 residential connections in Glendale. Average dry weather flows totaled approximately 1.35 MGD in 2006. Peak wet weather flows totaled approximately 12 MGD in 2006 but have been known to reach as high as 14 MGD. This represents a system wide peaking factor of approximately ten.

#### **Wastewater Collection, Treatment, and Disposal**

Wastewater is collected from individual sources through the City's collection system. Wastewater flows by gravity to the City's wastewater treatment plant, where conventional primary treatment occurs in a series of clarifiers. Primary treatment is limited to 5 MGD. Any flows in excess of this bypass clarification and are routed straight to the oxidation ponds. Effluent from the clarifiers flows through a series of oxidation ponds and into the Arcata Marsh and Wildlife Sanctuary (AMWS) where the wastewater is further treated to post-secondary standards and re-used for wetlands, ponds, and related wildlife habitat.

The City's wastewater facilities are permitted to treat up to 2.3 MGD mean daily dry weather flow averaged over a period of one calendar month.

#### **Condition Assessment**

**Overview.** Significant portions of the City's collection system are in severe need of repair and/or replacement due to inflow and infiltration (I&I). The City is aware of the problem and in the process of finalizing a Capital Improvement Plan (CIP) for its wastewater system. A good portion of the plan will focus on the collection system.

The City is currently under an ACLO for not meeting treatment requirements within the AMWS during wet weather conditions. The cited reason for the ACLO is due to the City's failure to meet 85% removal requirements included in their discharge permit during wet weather conditions in the past. The City's I&I problem contributes to this problem. A good portion of the violations were under a discharge permit that expired in 2004. The new discharge permit adopted since then has better incorporated wet weather flows into the permit. The City has appealed the ACLO, as they do not believe the infractions are water quality related but more technical violations of permit parameters.

The City also received an ACLC in July 2007 for effluent limit violations and sanitary sewer overflows between June 2004 and March 2007. The effluent limit violations mostly involved failure to meet 85% removal of TSS and TSS loading (lbs/day) in excess of permitted amounts. However, cyanide and copper limits were also exceeded a number of times. Sanitary sewer overflows (raw sewage spilling out of the sewer system) occur during winter months as a result of excessive I&I. The City has prepared a CIP focused on increasing treatment efficiencies within the AMWS by reducing short-circuiting, installing solar mixers, and improving vegetation cover. The CIP will also focus on reducing I&I within the collection system.

**Current Deficiencies.** The City's collection system experiences significant I&I during winter months. Older neighborhoods, such as Sunnybrae, contribute the most I&I.

**Underserved Areas.** All areas within the City receive wastewater service.

### **Proposed Improvements**

**System Upgrades.** As described above, the City is in the process of developing a CIP to address shortfalls within their wastewater collection and treatment systems. The City is poised to invest significant effort and resources to reduce I&I within their collection system and improve efficiencies within the treatment system.

**Future Expansion.** The Arcata USA is within the Urban Services Boundary set forth in the Arcata General Plan. Therefore, it is likely that these areas will be annexed and services extended to these areas. The Pacific Manor subdivision is already built-out, so annexation to the City may be more difficult. These homes would likely be better served by the City's wastewater system rather than the existing on-site septic systems. However, individual homeowners or the developers would be responsible for installing service laterals and certain portions of the collection system in order to connect to the City wastewater system. Additional improvements to ensure adequate capacity would also be required by the City.

**Cost and Schedule of Improvements.** The City's CIP will be completed in 2008 and will cover costs and schedules of improvements to its wastewater system. At this time, the City estimates \$2 million will be invested in its collection system and \$1 million will be invested in its treatment system over the next five years.

### **7.4.2. Blue Lake USA**

There are a total of two areas within the City's sphere of influence that comprise the Blue Lake USA. A high build-out estimate for total development potential of 143 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.2 for a more detailed description of the USA and its development potential.

### **7.4.2.1. Summary**

#### **Findings**

The City of Blue Lake's wastewater system is in fair condition overall. The collection system has significant I&I and it appears the treatment facility is not meeting its waste discharge requirements related to organic loading. The WWTF is currently processing on average 400 lbs BOD/day, thereby exceeding its permitted loading of 300 lbs/day. The City will need to expand and upgrade its treatment capacity, as well as reduce I&I within its collection system.

The City is operating under a waste discharge permit (WDR) that was adopted in 1994 and does not reflect some of the current issues discussed in Section 7.2. Any improvements to this facility should be made so that it will be in compliance with the requirements that will be contained in a current permit.

The City's wastewater facilities are permitted to treat up to 0.25 MGD mean daily dry weather flow averaged over a period of one calendar month. Existing dry weather flows are currently 0.15 MGD, and peak wet weather flows are around 1 MGD. Therefore, the treatment facility is operating at approximately 60% of hydraulic capacity and could therefore accommodate the forecast development potential, as long as treatment capacity is expanded and I&I is controlled.

#### **Existing Capacity**

Availability of connections within the City of Blue Lake wastewater system is not as straightforward as with the water system. According to the City's discharge permit, the system has an average dry weather design flow of 0.25 MGD. Considering the City's average dry weather flows are currently around 0.15 MGD, this would indicate the City is operating at 60% of capacity. Although organic loading to the facility appears to be in excess of its design and the City has significant I&I, the facility has not had any orders imposed by the RWQCB. Therefore, it is assumed that the City has a limited, but unknown number of additional connections, without making improvements to the treatment plant or addressing the I&I issue.

#### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Blue Lake USA and addresses infrastructure needs for existing development served by the City of Blue Lake and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed. The existing capacity of the system also includes connections within the City of Blue Lake as well.

The existing discharge permit is 13 years old and it is likely that additional requirements will be contained in the new permit that will require significant improvements to their system. The estimated cost for these improvements represents an "order of magnitude" cost and should be refined in a detailed facilities plan.

**Table 7-3. Wastewater system infrastructure assessment for the Blue Lake USA.**

<b>WASTEWATER SYSTEM STATISTICS</b>	
# of Existing Connections	515
# of Available Connections <sup>1</sup>	343
Permitted Dry Weather Treatment Capacity (MGD)	0.25
Existing Dry Weather Flows (MGD)	0.15
Existing Peak Wet Weather Flows (MGD)	1.0
I&I Peaking Factor	6 – 7
<b>LOW &amp; HIGH BUILD-OUT ESTIMATES</b>	
# of Projected New Connections	46 – 143
# of Total Future Connections <sup>2</sup>	561 – 658
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Upgrade POTW to meet current regulations <sup>1</sup></i>	\$5,000,000
<i>Collection System I&amp;I Upgrades</i>	\$4,000,000
<i>New summer disposal alternative</i>	\$2,000,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$11,000,000</b>
<b>Est. Cost per Existing Connection (\$)</b>	<b>\$21,359</b>
<b>Est. Financing Cost per Existing Connection (\$/Month)</b>	<b>\$114.18</b>
<b>Est. Range of Costs per Total Future Connection (\$)</b>	<b>\$16,717 - \$19,608</b>
<b>Est. Financing Cost per Total Future Connection (\$/Month)</b>	<b>\$89.36 - \$104.82</b>

NOTES: <sup>1</sup> The number of available connections was estimated based on the City's current ADWF being at 60% of capacity as set forth in their NPDES permit.

<sup>2</sup> This number does not include development within City limits.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$11,000,000 loan would amount to approximately \$706,000 per year. With 515 existing connections, monthly bills would have to be increased by approximately \$115 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by over \$89 per month to fund this loan. Therefore, monthly bills would have to increase between \$89 and \$115 per month to fund these wastewater improvements. In reality, we would expect the City to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **7.4.2.2. Wastewater System Service Area Description**

The City of Blue Lake currently provides wastewater services to residents within the City and 17 parcels outside the City, most of which are within the Blue Lake WSA. The entire USA would be

expected to receive wastewater service from the City of Blue Lake, upon annexation. The City also provides wastewater services to the Blue Lake Rancheria through contract.

### **System Standards**

The City of Blue Lake's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The City's current waste discharge requirements are contained in RWQCB Order No. 94-28. The City no longer has an NPDES portion of their permit since discharges to the Mad River were discontinued.

### **Fiscal Condition/Capital Replacement Program**

According to City records, they operate their wastewater system on an annual budget of approximately \$230,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The City has not developed a Capital Improvement Plan to date, and their reserves status is currently unknown.

### **Wastewater Flows**

There are approximately 515 wastewater connections within the City of Blue Lake USA. Average dry weather flows are approximately 0.15 MGD, while peak wet weather flows are approximately 1.0 MGD. This represents a system wide peaking factor of approximately six to seven (Winzler & Kelly, 2006b).

### **Wastewater Collection, Treatment, and Disposal**

The City of Blue Lake uses a gravity collection system that serves the residential community, industrial park, and commercial Districts in the City. In addition, sewer service is provided to a few residences outside the City limits. Blue Lake's collection system is composed of vitrified clay, asbestos cement, polyethylene, and PVC pipe. The system collects domestic, commercial, and industrial wastewaters and terminates at the Chartin Road Pump Station where wastewater is pumped through force mains to the headworks at the treatment plant. Two additional lift stations are located in and serve the Industrial Park.

The Blue Lake wastewater treatment plant (WWTP) is located in the northwest corner of the City near the flood plain of the Mad River. The treatment plant is a domestic municipal treatment system that consists of headworks, four treatment ponds, a chlorine disinfection system, and three rapid infiltration basins. The infiltration basins are located near the bank of the Mad River. The City recently constructed a rock filter to try and improve their effluent quality.

The WWTP is designed to handle an average hydraulic loading of 0.25 MGD and a BOD loading of 300 lbs/day. The plant is likely exceeding its treatment capacity. Average flows are currently 0.15 MGD with an average BOD concentration of 325 mg/L, which results in a BOD loading of over 400 lbs/day. Maximum month influent loadings of 1,400 mg/L BOD and 1,700 mg/L TSS have been experienced at the plant (Winzler & Kelly, 2006b).

## Condition Assessment

**Overview.** Significant portions of the City's collection system are in severe need of repair and/or replacement due to excessive inflow and infiltration (I&I). In 1984, selected sections of the collection system and laterals with the worst I&I were replaced through the Clean Water Grant Project to help reduce hydraulic loads on the wastewater treatment plant. The City has continued the effort to reduce I&I problems by replacing deteriorated and leaking sections of pipe as funds become available.

The number of violations to the City's WDR have been relatively few. However, their permit is over 13 years old and these permits are generally renewed every 5 years. Based upon our understanding of the issues and the direction of the RWQCB, we envision that significant improvements will be needed to meet the City's future WDR.

**Current Deficiencies.** The City's collection system experiences significant I&I during winter months, and the WWTP is operating in excess of its designed treatment capacity.

**Underserved Areas.** All areas within the City receive wastewater service.

## Proposed Improvements

**System Upgrades.** As described above, the City continues to address shortfalls within their wastewater collection and treatment systems. The City will need to invest significant effort and resources to reduce I&I within their collection system and to make improvements to the treatment and disposal system.

**Future Expansion.** All areas within the Blue Lake USA are within the Urban Services Boundary set forth in the Blue Lake General Plan. Therefore, it is likely that these areas will be annexed and services extended to these areas. Studies have also been conducted to assess the feasibility of accepting wastewater flows from the Glendale USA.

**Cost and Schedule of Improvements.** The City's CIP will be completed in 2008 and will cover costs and schedules of improvements to its wastewater system. At this time, the City estimates \$2 million will be invested in its collection system and \$9 million will be invested in its treatment and disposal systems over the next ten years. However, we believe that these estimates may be low and have presented order of magnitude costs in Table 7-3 to reflect the potential costs associated with meeting their new WDR.

### 7.4.3. Fortuna USA

There are a total of four areas within the City's sphere of influence that comprise the Fortuna USA. A high build-out estimate for total development potential of 450 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.3 for a more detailed description of the USA and its development potential.

#### 7.4.3.1. Summary

##### Findings

The City of Fortuna's wastewater system is in good condition overall, and was recently expanded in 2006 to improve capacity and performance. The City's wastewater facilities are permitted to treat up to 1.5 MGD mean daily dry weather flow averaged over a period of one calendar month. Existing dry weather flows are currently 0.95 MGD. Therefore, the treatment facility is operating at approximately 63% of its dry weather flow capacity. However, wet weather flows continue to pose a problem for the City.

The facility has a design peak wet weather flow of 4.5 MGD, although it has experienced flows of around 7 MGD. Any flows in excess of this amount are directed to holding ponds with a storage capacity of 7 MG, so any wet weather flows in excess of this storage are discharged to Strong's Creek with disinfection being the only treatment provided. It is questionable whether this process will continue to be allowed, as these flows do not receive secondary treatment as mandated by the Clean Water Act (this is similar to the problem the City of Eureka faces with its existing blending process). The EPA strongly discourages reliance on peak wet weather flow diversions around secondary treatment units. The City and WWTP would greatly benefit from further reduction of I&I within the collection system and/or expansion of the WWTP's wet weather flow capacity.

Further, the City's WDR is currently up for renewal and it is expected that the issues outlined in Section 7.2 will require additional upgrades to their facility.

### **Existing Capacity**

Availability of connections within the City of Fortuna wastewater system is not as straightforward as with the water system. According to the City's discharge permit, the system has an average dry weather design flow of 1.5 MGD and a peak wet weather design flow of 4.5 MGD. Considering the City's average dry weather flows are currently around 0.95 MGD, this would indicate the City is operating at 63% of capacity. The City's peak wet weather flows are currently around 7 MGD but with the use of holding ponds, the facility operates at 4.5 MGD. Therefore, the City is operating at 100% of wet weather capacity and it is difficult to estimate how many, if any, connections are available. With improvements to the collection system and a reduction in I&I, the City could reduce its peak wet weather flows and allow for more connections.

### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Fortuna USA and addresses infrastructure needs for existing development served by the City of Fortuna and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed. The existing capacity of the system includes connections within the Palmer Creek CSD as well.

**Table 7-4. Wastewater system infrastructure assessment for the Fortuna USA.**

<b>WASTEWATER SYSTEM STATISTICS</b>	
# of Existing Connections <sup>1</sup>	5,382
# of Available Connections <sup>2</sup>	0
Permitted Dry Weather Treatment Capacity (MGD)	1.5
Permitted Wet Weather Treatment Capacity (MGD)	4.5
Existing Dry Weather Flows (MGD)	0.95
Existing Peak Wet Weather Flows (MGD)	7.0
I&I Peaking Factor	7 – 8
<b>LOW &amp; HIGH BUILD-OUT ESTIMATES</b>	
# of Projected New Connections	294 – 450
# of Total Future Connections <sup>3</sup>	5,676 – 5,832
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Upgrade POTW to meet current regulations</i>	\$10,000,000
<i>Collection system I&amp;I upgrades</i>	\$5,000,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$15,000,000</b>
<b>Est. Cost per Existing Connection (\$)</b>	<b>\$2,787</b>
<b>Est. Financing Cost per Existing Connection (\$/Month)</b>	<b>\$14.90</b>
<b>Est. Range of Costs per Total Future Connection (\$)</b>	<b>\$2,572 – \$2,643</b>
<b>Est. Financing Cost per Total Future Connection (\$/Month)</b>	<b>\$13.75 - \$14.13</b>

NOTES: <sup>1</sup> 5,229 connections in City of Fortuna plus 153 connections in Palmer Creek CSD.

<sup>2</sup> The facility currently operates at peak wet weather design capacity.

<sup>3</sup> This number does not include development within City limits.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$15,000,000 loan would amount to approximately \$962,000 per year. With 5,382 existing connections, monthly bills would have to be increased by approximately \$15 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by \$14 per month to fund this loan. Therefore, monthly bills would have to increase between \$14 and \$15 per month to fund these wastewater improvements. In reality, we would expect the City to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

### **7.4.3.2. Wastewater System**

#### **Service Area Description**

The Palmer Creek CSD provides wastewater collection services to its residents and contracts with the City of Fortuna for wastewater treatment and disposal. Areas within the Fortuna USA, outside the Palmer Creek CSD, do not receive municipal wastewater service and must install individual

on-site septic systems. To realize full development potential, areas within the Fortuna USA would need to be annexed to the City of Fortuna. If the area currently served by Palmer Creek CSD were to be annexed, the existing collection system would likely come under the control of the City following any required upgrades to meet the City's development standards for annexations.

The City currently receives and treats wastewater from Palmer Creek CSD.

### **System Standards**

The City of Fortuna's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards. The City's current waste discharge requirements are contained in RWQCB Order No. R1-2001-0041, NPDES Permit No. CA0022730.

Palmer Creek CSD's wastewater collection system is subject to the California Sanitary Sewer System Overflow (SSO) program and must develop a sanitary sewer management plan and report regularly to the State Water Resources Control Board. Public agencies, such as CSD's, that contain more than one mile of sewer lines are subject to the SSO program.

### **Fiscal Condition/Capital Replacement Program**

According to City records, Fortuna operates their wastewater system on an annual budget of approximately \$325,000 (City of Fortuna Fiscal Year 2007-08 budget). The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. It is unknown when the City's latest Capital Improvement Plan was developed, and their reserves status is currently unknown.

Palmer Creek CSD operates their wastewater collection system on an annual budget of approximately \$100,000. The majority of this income is from service charges, but funding also comes from property taxes, assessments, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have approximately \$60,000 in reserves.

### **Wastewater Flows**

Approximately 5,229 units receive wastewater service within the City of Fortuna (City of Fortuna, 2007). Approximately 90% of these connections are residential, while the remaining 10% are commercial. Average dry weather flows totaled approximately 0.95 MGD in 2006. Peak wet weather flows reached approximately 7 MGD in 2006 (Gehrke, 2007). This represents a system wide peaking factor of approximately seven.

There are 153 existing residential wastewater connections within the Palmer Creek CSD generating an average dry weather flow of 20,000 gpd and wet weather flows of 30,000 gpd (Palmer Creek CSD, 2007). The Palmer Creek CSD reports that it is currently at its contracted limit with the City of Fortuna for wastewater flows. This contract would need to be amended to allow additional development within the District.

### **Wastewater Collection, Treatment, and Disposal**

Wastewater is collected throughout the City's collection system. Two main lines enter the WWTP: one is a gravity line and the other is a force main that pumps from the California Conservation

Corps wet well pump station on Alamar Way. There is one other pump station in the system (Strong's Creek Pump Station).

The City's WWTP has undergone several upgrades, the most recent of which was completed in 2006. The plant consists of headworks, primary clarification, activated sludge basins, secondary clarification, and anaerobic sludge digestion. The new facility has a dry weather capacity of 1.5 MGD, and a wet weather capacity of 4.5 MGD (Oscar Larson & Associates, 2006). Any wet weather flows in excess of this are stored in storage ponds. However, the storage ponds only have a one- to two-day capacity during wet weather and they need approximately one week of dry weather to recover. In extreme wet weather conditions, wastewater in the ponds is treated to meet effluent standards for waste stabilization ponds and is disinfected prior to overflow to Strong's Creek. Generally, treated effluent is disinfected prior to discharge to Strong's Creek at its confluence with the Eel River. During the discharge prohibition period, wastewater is discharged to a percolation pond on an exposed gravel bar.

Palmer Creek's wastewater collection system joins the City of Fortuna's collection system by the northern boundary of Fortuna.

### **Condition Assessment**

**Overview.** Portions of the City's collection system are in need of repair and/or replacement due to inflow and infiltration (I&I). The City will likely have to find an alternative for summertime disposal during the discharge prohibition period to the Eel River. In addition, the City will have to deal with CTR and disinfection by-products issues.

**Current Deficiencies.** The City's collection system experiences significant I&I during winter months. The storage ponds do not have sufficient capacity to hold excess flows during prolonged periods of wet weather flows.

**Underserved Areas.** All areas within the City receive wastewater service.

### **Proposed Improvements**

**System Upgrades.** As described above, the City has developed a CIP to address shortfalls within their wastewater collection system. The City has invested and remains poised to invest significant effort and resources to reduce I&I within their collection system. The City will also have to address many of the issues outlined in Section 7.2

**Future Expansion.** The City of Fortuna is looking to annex the USAs within the time frame of this General Plan, with the exception of the USA currently served by Palmer Creek CSD. The State forced Fortuna to accept Palmer Creek into its sphere of influence and take sewage from Palmer Creek's collection system. Fortuna requires all proposed annexations to be up to Fortuna's sewer/water/roads standards and would require a new assessment District where there are deficiencies. The City is currently in the process of updating its general plan, and that document should be referred to for additional information.

**Cost and Schedule of Improvements.** The City of Fortuna recently developed a five year Capital Improvement Plan in 2006 that covers costs and schedules for improvements to its wastewater collection and treatment system. These include routine maintenance activities in addition to improvements to both systems. Total project costs included in the CIP are nearly \$10.5 million dollars, of which approximately 10% will be covered through reserves built in the wastewater fund and the remaining 90% will be covered through bonds.

#### **7.4.4. Garberville USA**

Garberville's commercial downtown area and surrounding residential areas comprise the Garberville USA. A high build-out estimate for total development potential of 108 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.4 for a more detailed description of the USA and its development potential.

##### **7.4.4.1. Summary**

###### **Findings**

Garberville's wastewater system is generally in poor condition overall, and is currently operating under a Cease and Desist Order for hydraulic loading in excess of design capacity and chronic effluent limit violations. The District is currently under a self imposed moratorium for new development. Feasibility studies have been prepared outlining alternatives for treatment and disposal improvements, and the improvements must be completed by November 2009. It appears that a constructed wetlands alternative has been selected as the preferred alternative. I&I continues to be a significant problem and requires attention.

The City's wastewater facilities are permitted to treat up to 0.06 MGD mean daily dry weather flow averaged over a period of one calendar month. Existing dry weather flows are currently 0.14 MGD, or over twice the permitted amount. The treatment facility is operating at approximately 233% of its dry weather capacity. The facility is also exceeding its permitted wet weather capacity.

###### **Existing Capacity**

There are no available connections within Garberville's wastewater system. Average dry weather flows and peak wet weather flows currently exceed permitted amounts.

###### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Garberville USA and addresses infrastructure needs for existing development served by Garberville and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 7-5. Wastewater system infrastructure assessment for the Garberville USA.**

<b>WASTEWATER SYSTEM STATISTICS</b>	
# of Existing Connections	420
# of Available Connections <sup>1</sup>	0
Permitted Dry Weather Treatment Capacity (MGD)	0.06
Permitted Wet Weather Treatment Capacity (MGD)	0.3
Existing Dry Weather Flows (MGD)	0.14
Existing Peak Wet Weather Flows (MGD)	0.55
I&I Peaking Factor	4
<b>LOW &amp; HIGH BUILD-OUT ESTIMATES</b>	
# of Projected New Connections	63 – 108
# of Total Future Connections	483 – 528
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>WWTP Upgrades (Treatment &amp; Disposal)</i>	\$10,000,000
<i>Collection System I&amp;I Upgrades</i>	\$5,000,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$15,000,000</b>
<b>Est. Cost per Existing Connection (\$)</b>	<b>\$35,714</b>
<b>Est. Financing Cost per Existing Connection (\$/Month)</b>	<b>\$190.91</b>
<b>Est. Range of Costs per Total Future Connection (\$)</b>	<b>\$28,409 - \$31,056</b>
<b>Est. Financing Cost per Total Future Connection (\$/Month)</b>	<b>\$151.86 - \$166.01</b>

NOTES: <sup>1</sup> The facility currently operates in excess of both average dry weather and peak wet weather design capacity.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$15,000,000 loan would amount to approximately \$962,000 per year. With 420 existing connections, monthly bills would have to be increased by approximately \$191 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by nearly \$152 per month to fund this loan. Therefore, monthly bills would have to increase between \$152 and \$191 per month to fund these wastewater improvements. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **7.4.4.2. Wastewater System Service Area Description**

All potential development within the Garberville USA would receive wastewater service from the Garberville Sanitary District (GSD).

## **System Standards**

The District's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The District's current waste discharge requirements are contained in RWQCB Order No. R1-2000-0058. The District does not have an NPDES permit as they do not directly discharge to the Eel River, but rather discharge year-round to percolation ponds. Standards for percolation ponds are currently changing, and this type of discharge will likely not be allowed during the discharge prohibition period (May 15<sup>th</sup> to September 30<sup>th</sup>) in the very near future. The District is currently under a Cease and Desist Order (Order No. R1-2004-0097) for discharging effluent in violation of its waste discharge requirements.

## **Fiscal Condition/Capital Replacement Program**

According to District records, they operate their wastewater system on an annual budget of approximately \$225,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have \$125,000 in wastewater reserves.

## **Wastewater Flows**

Approximately 420 units receive wastewater service within the Garberville USA (Garberville Sanitary District, 2007). Average dry weather flows consistently exceed the permitted 0.06 MGD of the WWTP and averaged 0.14 MGD in 2003/2004. Peak wet weather flows have also exceeded the permitted 0.3 MGD of the WWTP, and were as high as 0.55 MGD during 2003/2004 (LACO Associates, 2005). This represents a system wide peaking factor of approximately four.

## **Wastewater Collection, Treatment, and Disposal**

The District's collection system consists of original portions of the system constructed by the CCC in the 1930s, portions that were reconstructed after the 1964 flood, and portions reconstructed more recently. The collection system flows by gravity with the aid of lift stations to convey the wastewater to the treatment facility. Treatment works consist of headworks, three treatment ponds designed to work in series, disinfection, and two percolation ponds used for year-round disposal. The treatment plant was constructed in 1984, and the design capacity of the system is for a peak wet weather flow of 0.3 MGD.

## **Condition Assessment**

**Overview.** The District is under a Cease and Desist Order (Order No. R1-2004-0097) for discharging effluent in violation of its waste discharge requirements due to increased population growth and summertime tourism activity. Violations cited in the Order include hydraulic loading in excess of design capacity and chronic effluent limit violations. In addition, the GSD imposed a development moratorium that prohibits new connections until treatment plant improvements are complete. The District has prepared a draft report analyzing viable alternatives to increase its treatment capacity and has decided on a constructed wetlands alternative as well as new locations for the summertime disposal of treated effluent. The Order has set forth a completion date for the new facility of November 2009.

The District currently relies on percolation ponds for disposal. This form of disposal is becoming increasingly difficult to permit due to stringent regulations governing disposal to the Eel River during the discharge prohibition period. Percolation ponds adjacent to the Eel River have been considered direct discharges. Other communities downstream such as Rio Dell and Ferndale are being required by the RWQCB at this time to find alternative methods of disposal.

**Current Deficiencies.** The District's collection system experiences significant I&I during winter months. Treatment capacity is currently exceeded during wet weather conditions.

**Underserved Areas.** All areas within the District receive wastewater service.

### **Proposed Improvements**

**System Upgrades.** As described above, the District is in the process of planning additional treatment and disposal capacity. A future reclamation project and collection system upgrades are also being planned at this time.

**Future Expansion.** The District is under a moratorium for additional connections until additional capacity is constructed and the WWTP is operating within its waste discharge requirements. Once the District completes planned treatment and disposal upgrades, the moratorium would be lifted allowing for additional development.

**Cost and Schedule of Improvements.** The District does not have a CIP in place at this time. Preliminary cost estimates for the treatment plant upgrades are approximately \$3 million. If a new disposal alternative is required, this could likely cost the District upward of \$10 million.

## **7.4.5. Glendale USA**

The Glendale USA is served by a collection system owned and operated by the FGCS, who contracts with the City of Arcata for treatment and disposal. A high build-out estimate for total development potential of 1,189 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.5 for a more detailed description of the USA and its development potential.

### **7.4.5.1. Summary**

#### **Findings**

Glendale's wastewater system is in very good condition overall. The collection system was installed in 1990, and raw wastewater is currently pumped to the City of Arcata for treatment and disposal. The system currently has approximately 165 connections, and flows currently range between 37,000 gpd during dry weather and 75,000 gpd during wet weather. The District's existing contract with the City allows for up to 71,200 gpd average dry weather flow, and therefore the system has capacity for approximately 80 to 100 more connections. The low buildout estimate can likely be accommodated through the existing contract with the City of Arcata. Alternative solutions to treatment and disposal must be found to accommodate any development in excess of this.

#### **Existing Capacity**

Availability of connections within Glendale's wastewater system is limited by contractual amount with the City of Arcata. The District engineer estimates there are approximately 80 to 100 available connections.

## Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Glendale USA and addresses infrastructure needs for existing development served by the FGCS D, for planned developments in the USA within the next 10-year planning horizon and for build-out conditions. There are some planned developments within the Glendale USA, so an infrastructure assessment for the next 10-year planning horizon is also presented.

**Table 7-6. Wastewater system infrastructure assessment for the Glendale USA.**

<b>WASTEWATER SYSTEM STATISTICS</b>	
# of Existing Connections	165
# of Available Connections <sup>1</sup>	100
Permitted Dry Weather Treatment Capacity (MGD) <sup>2</sup>	---
Existing Dry Weather Flows (MGD)	0.037
Existing Peak Wet Weather Flows (MGD)	0.075
I&I Peaking Factor	2
<b>LOW &amp; HIGH BUILD-OUT ESTIMATES</b>	
# of Projected New Connections	20 – 1,189
# of Total Future Connections	185 – 1,354
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>New treatment and disposal facility</i>	\$5,000,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$5,000,000</b>
<b>Est. Cost per Existing Connection (\$)</b>	<b>\$30,303</b>
<b>Est. Financing Cost per Existing Connection (\$/Month)</b>	<b>\$161.99</b>
<b>Est. Range of Costs per Total Future Connection (\$)</b>	<b>\$3,693 - \$27,027</b>
<b>Est. Financing Cost per Total Future Connection (\$/Month)</b>	<b>\$19.74 - \$144.48</b>

NOTES: <sup>1</sup> According to the District engineer, there are approximately 100 connections worth of capacity remaining in the existing contract with the City of Arcata.

<sup>2</sup> The FGCS D contracts with the City of Arcata for treatment and disposal.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$5,000,000 loan would amount to approximately \$321,000 per year. With 165 existing connections, monthly bills would have to be increased by \$162 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by approximately \$20 per month to fund this loan. Therefore, monthly bills would have to increase between \$20 and \$162 per month to fund these wastewater improvements. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

### **7.4.5.2. Wastewater System**

#### **Service Area Description**

All potential development within the Glendale USA would receive wastewater service from the Fieldbrook Glendale Community Services District (FGCSD). The District maintains a collection system and is under contract with the City of Arcata for treatment and disposal of wastewater, which is pumped into the City's collection system.

#### **System Standards**

The District's wastewater system is a public system and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

According to District records, they operate their wastewater system on an annual budget of approximately \$180,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have approximately \$80,000 in wastewater reserves.

#### **Wastewater Flows**

Approximately 165 units receive wastewater service within the Glendale USA, of which all are residential connections. Average dry weather flows were approximately 37,000 gpd in 2006. Peak wet weather flows were approximately 75,000 gpd during 2006. This represents a system wide peaking factor of approximately two, representative of the new collection system (Carnam, 2007).

#### **Wastewater Collection, Treatment, and Disposal**

The District's collection system was installed in 1990. Wastewater is pumped through a force main to a connection point with the City of Arcata's collection system located near Giuntoli Rd. Wastewater is then treated and disposed of by the City.

#### **Condition Assessment**

**Overview.** The District's contract with the City of Arcata allows for discharge of up to 71,200 gallons during average dry weather conditions. It is estimated an additional 80 to 100 single family homes could be added to the system under this contracted amount. The City has indicated it is not interested at this time to increase the District's contract amount and has recommended the District consider other alternatives. The District has approached the City of Blue Lake and will participate in other studies to evaluate alternatives and costs for potential interconnection.

**Current Deficiencies.** No deficiencies exist with the District's existing collection system. The District has two pump stations and only one (mobile) stand by generator that currently is transferred between the two stations during a power outage. Over the long term it would be beneficial to install a second stand by generator at the smaller of the two pump stations.

**Underserved Areas.** Some areas within the USA do not receive wastewater service.

## **Proposed Improvements**

**System Upgrades.** The District does not have plans for any system upgrades at this time.

**Future Expansion.** The District is interested in extending service to unserved areas within the USA and to any new development within the USA.

**Cost and Schedule of Improvements.** The District does not have a CIP in place at this time.

### **7.4.6. Loleta USA**

The Loleta USA is served by a community sewer system owned and operated by the Loleta Community Services District (LCSD). A high build-out estimate for total development potential of 116 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.7 for a more detailed description of the Loleta USA and its development potential.

#### **7.4.6.1. Summary**

##### **Findings**

Loleta's wastewater system is in marginal to fair condition overall. The treatment facilities have received a Cease and Desist Order (CDO), a Cleanup and Abatement Order (CAO), and an Administrative Civil Liability Order (ACLO) within the past three years. In 2004, the facility did not have a licensed operator on staff, and the CSD threatened to not staff the facility on a daily basis, which led to issuance of the Cleanup and Abatement Order. The facilities are quite old and regularly violate effluent limits as set forth in their waste discharge requirements. The facility is currently operated by the City of Fortuna as Loleta CSD does not have qualified personnel.

The system currently has approximately 240 connections, and flows range between .06 MGD during dry weather and 0.6 MGD during wet weather. The facility has an average dry weather flow design capacity of 0.1 MGD, and is therefore operating at approximately 60% of its dry weather capacity. However, wet weather flows are probably in excess of the facility's treatment capacity. The current method of disposal is discharge to percolation ponds aside the Eel River. This form of disposal is coming under increasing scrutiny within the Eel River basin, and other dischargers utilizing similar disposal methods are being forced to find alternative methods of disposal.

##### **Existing Capacity**

Availability of connections within the Loleta wastewater system is not as straightforward as with the water system. According to the City's discharge permit, the facility has an average dry weather flow design capacity of 0.1 MGD. Considering average dry weather flows are currently around 0.06 MGD, this would indicate the District is operating at 60% of capacity.

However, the District is currently having difficulty meeting their discharge requirements as evidenced by a recent CDO, CAO, and ACLO, which indicate the facilities' treatment capacity is being exceeded. Flows of up to 600% of the treatment plant design capacity are experienced during wet weather. Therefore, available capacity is estimated to be zero until these problems are resolved. With improvements to the treatment system and reduction in I&I, the District's wastewater system could likely realize its full dry weather capacity, allowing for an additional 160 connections.

## Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Loleta USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed. The estimated cost for these improvements represents an “order of magnitude” cost, assuming the issues discussed in section 7.2 are applied to this system and should be refined in a detailed facilities plan.

**Table 7-7. Wastewater system infrastructure assessment for the Loleta USA.**

<b>WASTEWATER SYSTEM STATISTICS</b>	
# of Existing Connections	240
# of Available Connections <sup>1</sup>	0
Permitted Dry Weather Treatment Capacity (MGD)	0.1
Existing Dry Weather Flows (MGD)	0.06
Existing Peak Wet Weather Flows (MGD)	0.6
I&I Peaking Factor	10
<b>LOW &amp; HIGH BUILD OUT ESTIMATES</b>	
# of Projected New Connections	87 – 116
# of Total Future Connections	327 – 356
Needed Infrastructure Upgrades	Estimated Cost (\$)
<i>Treatment facility upgrades</i>	\$5,000,000
<i>Collection System Upgrades</i>	\$4,000,000
<i>Alternative Disposal Method</i>	\$1,000,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$10,000,000</b>
<b>Est. Cost per Existing Connection (\$)</b>	<b>\$41,667</b>
<b>Est. Financing Cost per Existing Connection (\$/Month)</b>	<b>\$222.73</b>
<b>Est. Range of Costs per Total Future Connection (\$)</b>	<b>\$28,090 - \$30,581</b>
<b>Est. Financing Cost per Total Future Connection (\$/Month)</b>	<b>\$150.16 - \$163.47</b>

NOTES: <sup>1</sup> The number of available connections was estimated at zero given the District is failing to meet current discharge requirements.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$10,000,000 loan would amount to approximately \$641,000 per year. With 240 existing connections, monthly bills would have to be increased by approximately \$223 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by over \$150 per month to fund this loan. Therefore, monthly bills would have to increase between \$150 and \$223 per month to fund these wastewater improvements. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific

studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **7.4.6.2. Wastewater System**

##### **Service Area Description**

All proposed development within the Loleta USA would receive wastewater service from the LCSD. The District operates and maintains a wastewater collection, treatment, and disposal system.

##### **System Standards**

The District's wastewater system is a public system and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The District's current waste discharge requirements are contained in RWQCB Order No. R1-2001-0059 and NPDES Permit No. CA0023671.

##### **Fiscal Condition/Capital Replacement Program**

According to District records, they operate their wastewater system on an annual budget of approximately \$185,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently have \$220,000 in reserves.

##### **Wastewater Flows**

Approximately 240 connections currently receive wastewater service within the Loleta USA, of which all are residential connections except for two industrial connections serving the Loleta Cheese Factory and the Humboldt Creamery Association facility. 100% of homes within the USA are serviced. Average dry weather flows are estimated at approximately 60,000 gpd. Peak wet weather flows are estimated at approximately 600,000 gpd. This represents a system wide peaking factor of approximately ten.

##### **Wastewater Collection, Treatment, and Disposal**

The District's collection system consists of approximately 2.0 miles of pipe. Wastewater is collected from residences throughout the USA and flows by gravity to the Loleta WWTP. Treatment consists of an aeration basin, clarifier, sludge storage vault, chlorine contact chamber, chlorine and sulfur flow-proportioning equipment, and an evaporation/ percolation pond. According to the District's waste discharge requirements, the pond overflows to an unnamed slough, which is tributary to the Eel River, during periods of high rainfall. The treatment plant has a design capacity of 100,000 gpd.

##### **Condition Assessment**

**Overview.** The District is currently under a Cease and Desist Order No. R1-2004-0096 for chronic effluent limit violations, excessive I&I which during the winter of 2004 caused the clarifier to overflow within the WWTP, and lack of control systems and auxiliary power at the WWTP to power the activated sludge process and chlorination/dechlorination equipment in the event of a power outage.

The District was also served a Cleanup and Abatement Order in 2004 for not having a Grade II licensed operator on staff, for continued violations to the NPDES permit, and for threatening to not staff the facility on a daily basis. A rescission of the order was issued approximately five months later upon compliance with the order.

The District was also served Administrative Civil Liability Order No. R1-2007-0003 in February 2007 for 91 exceedances of effluent limitations between 2000 and 2005. A compliance project has been initiated. Projects completed to date include improvements to the disinfection system, modifications to the chlorine contact basin, and installation of a new alarm system and an emergency generator. The remaining planned expenditures include improvements to reduce I&I.

The District is under contract with a licensed operator to supervise operations at the Loleta WWTP.

**Current Deficiencies.** The District has significant problems with I&I within their collection system. The District currently relies on percolation ponds for disposal. This form of disposal is becoming increasingly difficult to permit due to stringent regulations governing disposal to the Eel River during the discharge prohibition period. Other communities such as Rio Dell and Ferndale are being required by the RWQCB at this time to find alternative methods of disposal.

**Underserved Areas.** All areas within the USA receive wastewater service from the District.

### **Proposed Improvements**

**System Upgrades.** The District does not have plans for any system upgrades at this time aside from scheduled improvements to the collection system as mandated by Administrative Civil Liability Order No. R1-2007-0003.

**Future Expansion.** The District is not interested in extending service to any new development within the USA aside from existing subdivision and infill plans.

**Cost and Schedule of Improvements.** The District does not have a CIP in place at this time but plans on spending approximately \$80,000 through the 2009/2010 budget year on collection system analysis and repair.

## **7.4.7. Manila USA**

The Manila USA is served by a community sewer system owned and operated by the Manila Community Services District (MCSD). A high build-out estimate for total development potential of 233 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.8 for a more detailed description of the Manila USA and its development potential.

### **7.4.7.1. Summary**

#### **Findings**

Manila's wastewater system is in good condition overall. The community relies on a STEP system that pumps liquid effluent from resident's septic tanks into a force main to treatment. The treatment system consists of three free surface wetlands, two surface aerated facultative ponds, and four percolation ponds (rapid infiltration basins) for disposal.

The system currently has approximately 444 connections, and flows currently range between .066 MGD during dry weather and 0.21 MGD during wet weather. The facility has an average dry

weather flow design capacity of 0.14 MGD, and is therefore operating at approximately 47% capacity.

This system is currently in compliance with its WDR and has sufficient capacity to serve forecasted potential future development without major improvements, other than extensions that might be needed to serve a particular parcel.

**Existing Capacity**

Manila's wastewater system is currently operating at approximately 47% of its average dry weather design capacity. The facility has not had any problems meeting its discharge requirements. Therefore, it is assumed the facility could realize its full average dry weather capacity, allowing for an additional 500 connections.

**Summary of Required Improvements**

This system has sufficient capacity to meet the needs of future development over the planning period without needing major improvements.

**Table 7-8. Wastewater system infrastructure assessment for the Manila USA.**

<b>WASTEWATER SYSTEM STATISTICS</b>	
# of Existing Connections	444
# of Available Connections <sup>1</sup>	500
Permitted Dry Weather Treatment Capacity (MGD)	0.14
Existing Dry Weather Flows (MGD)	0.066
Existing Peak Wet Weather Flows (MGD)	0.21
I&I Peaking Factor	3
<b>LOW &amp; HIGH BUILD-OUT ESTIMATES</b>	
# of Projected New Connections	233
Needed Infrastructure Upgrades	Estimated Cost (\$)
None needed	\$0
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$0</b>
<b>Est. Cost per Existing Connection (\$)</b>	<b>\$0</b>
<b>Est. Financing Cost per Existing Connection (\$/Month)</b>	<b>\$0</b>
<b>Est. Range of Costs per Total Future Connection (\$)</b>	<b>\$0</b>
<b>Est. Financing Cost per Total Future Connection (\$/Month)</b>	<b>\$0</b>

NOTES: <sup>1</sup> The number of available connections was estimated based on the District's current ADWF being at 47% of capacity as set forth in their NPDES permit.

Fortunately, Manila has no major existing deficiencies related to their wastewater infrastructure, and can serve future build-out estimates with this infrastructure. Future connections will need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **7.4.7.2. Wastewater System**

##### **Service Area Description**

All proposed development within the Manila USA would receive wastewater service from the MCSD. The District operates and maintains a wastewater collection, treatment, and disposal system.

##### **System Standards**

The District's wastewater system is a public system and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The District's current waste discharge requirements are contained in RWQCB Order No. R1-1995-0002. The District does not have an NPDES permit as they do not directly discharge to a surface water body.

##### **Fiscal Condition/Capital Replacement Program**

According to District records, they operate their wastewater system on an annual budget of approximately \$385,000. The majority of this income is from service charges, but funding also comes from interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues, but the District is implementing a rate increase to begin accumulating these funds. The District developed a preliminary Capital Improvement Plan in August 2007, and they currently do not have built up reserves.

##### **Wastewater Flows**

Approximately 444 parcels currently receive wastewater service within the Manila USA, of which 309 are single family connections, 72 are multi family connections, and 7 are non-residential connections. Approximately 99% of homes within the USA are serviced. Average dry weather flows are estimated at approximately 66,000 gpd. Peak wet weather flows are estimated at approximately 210,000 gpd (Manila CSD, 2007). This represents a system wide peaking factor of approximately three.

##### **Wastewater Collection, Treatment, and Disposal**

Historically, the residences within the District were served by on-site septic systems. Septic systems surveys performed by the Regional Water Quality Control Board (RWQCB) and the Humboldt County Health Department in the mid 1970s identified a high rate of failing on-site leachfield systems in the Manila community. These failing systems were ascertained to present a significant public health hazard in 1977. Consequently, a septic tank effluent pumping and leach bed disposal system was installed in 1978 by the District as an interim disposal system to be used until construction of a centralized municipal wastewater treatment plant by the Humboldt Bay Wastewater Authority. The concept of a centralized treatment plant was abandoned shortly thereafter (the City of Arcata opted for its own solution), and Manila was required to construct a long-range solution for its wastewater treatment and disposal.

In 1988, a dual pressure distribution leachfield disposal system was completed, consisting of approximately 20,000 feet of pressurized distribution and piping and occupying approximately six acres. A little over a year after construction and operation, the field showed signs of failing. In 1991, the leachfield system was certified as "failed" by the State Water Resources Control Board, which resulted in Manila's eligibility to receive modification/replacement grant funding for wastewater treatment and disposal remediation.

In 1994 the District adopted plans for a proposed treatment plant consisting of a surface aerated facultative pond followed by constructed wetlands and rapid infiltration in percolation ponds. The system was designed for an average daily flow of 140,000 gpd. This treatment plant became operational in 1995.

Wastewater is collected from throughout the District's sewer system through a series of septic tank effluent pumps (STEP). The District has pumps installed in septic tanks throughout the service area that pump raw wastewater into a force main to treatment. The treatment works are located on a large parcel, with four percolation ponds (rapid infiltration basins), three free surface wetlands, and two surface aerated facultative ponds. The treatment plant has a design capacity of 140,000 gpd.

### **Condition Assessment**

**Overview.** The District's collection system and treatment system are in overall good condition. The District estimates the treatment system is currently operating at approximately 47% of its design capacity.

**Current Deficiencies.** The District does not have any significant deficiencies at this time.

**Underserved Areas.** All areas within the USA receive wastewater service from the District.

### **Proposed Improvements**

**System Upgrades.** The District does not have plans for any system upgrades at this time aside from scheduled improvements to the collection system as may be needed to serve new parcels.

**Future Expansion.** The District is interested in expanding services one or two miles south of current service boundary depending on potential development. However, the District currently feels it is not economical to expand services due to permitting fees, rights of way, and costs associated with extending water and sewer mains. The District would be interested in expanding if a major developer were willing to finance the studies, permits, and pipeline extensions.

**Cost and Schedule of Improvements.** The District developed a preliminary CIP in August 2007.

## **7.4.8. McKinleyville USA**

The McKinleyville USA is served by a community sewer system owned and operated by the McKinleyville Community Services District (MCSD). A high build-out estimate for total development potential of 4,112 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.9 for a more detailed description of the McKinleyville USA and its development potential.

### **7.4.8.1. Summary**

#### **Findings**

McKinleyville's wastewater system is in very good condition overall and experiences some of the lowest I&I in the County. The District's collection system was installed in the mid 1980's and has been well maintained over the years. The District conducts smoke testing and manhole inspections every winter. The treatment system consists of two primary oxidation ponds, three secondary oxidation ponds, a new constructed wetland completed in 2005, and disinfection facilities. Disposal to the Mad River occurs during winter months, and treated wastewater is used for land application during the discharge prohibition period (May 15<sup>th</sup> to September 30<sup>th</sup>).

The system currently has approximately 4,600 connections, and flows currently range between .9 MGD during dry weather and 2 MGD during wet weather. The facility has a biological treatment capacity of 1.18 MGD, and is therefore operating at approximately 76% capacity.

### Existing Capacity

McKinleyville's wastewater system is currently operating at approximately 76% of its design capacity. Therefore, it is assumed the facility could realize its full average dry weather capacity, allowing for an additional 1,453 connections before upgrades would be needed.

### Summary of Required Improvements

The following table summarizes the infrastructure assessment for the McKinleyville USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 7-9. Wastewater system infrastructure assessment for the McKinleyville USA.**

<b>WASTEWATER SYSTEM STATISTICS</b>	
# of Existing Connections	4,600
# of Available Connections <sup>1</sup>	1,453
Permitted Dry Weather Treatment Capacity (MGD)	1.18
Existing Dry Weather Flows (MGD)	0.9
Existing Peak Wet Weather Flows (MGD)	2
I&I Peaking Factor	2
<b>LOW &amp; HIGH BUILD-OUT ESTIMATES</b>	
# of Projected New Connections	2,224 – 4,112
# of Total Future Connections <sup>2</sup>	6,824 – 8,712
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Improvements to collection system</i>	\$1,000,000
<i>CTR compliance</i>	\$2,000,000
<i>Expand treatment facilities</i>	\$5,000,000
<i>Additional disposal capacity</i>	\$2,000,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$10,000,000</b>
<b>Est. Cost per Existing Connection (\$)</b>	<b>\$2,173</b>
<b>Est. Financing Cost per Existing Connection (\$/Month)</b>	<b>\$11.62</b>
<b>Est. Range of Costs per Total Future Connection (\$)</b>	<b>\$1,148 - \$1,465</b>
<b>Est. Financing Cost per Total Future Connection (\$/Month)</b>	<b>\$6.14 - \$7.83</b>

NOTES: <sup>1</sup> The number of available connections was estimated based on the City's current ADWF (0.9 MGD) being 76% of capacity as set forth in their waste discharge requirements (1.18 MGD).

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$10,000,000 loan would amount to approximately \$641,000 per year. With 4,600 existing connections, monthly bills would have to be increased by approximately \$12 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by approximately \$6 per month to fund this loan. Therefore, monthly bills would have to increase between \$6 and \$12 per month to fund these wastewater improvements. In reality, we would expect the District to use built up reserves and apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and

have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **7.4.8.2. Wastewater System**

##### **Service Area Description**

The McKinleyville USA receives wastewater service from McKinleyville Community Services District (MCSD). The urban service area extends from North Bank Road in the South to the Arcata-Eureka Airport.

##### **System Standards**

MCSD's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

MCSD's current waste discharge requirements are contained in RWQCB Order No. R1-2001-60, NPDES Permit No. CA0024490. The District is currently under Administrative Civil Liability Order No. R1-2007-0018, which sets a compliance schedule for improving the performance of their new constructed wetland. To date, the wetlands seem to be performing as designed.

##### **Fiscal Condition/Capital Replacement Program**

According to MCSD records, they operate their wastewater system on an annual budget of approximately \$1.6 million. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are accumulated through revenues. The City's latest Capital Improvement Plan was developed in 2007, and they currently have approximately \$2.4 million in wastewater reserves.

##### **Wastewater Flows**

Approximately 4,600 connections receive wastewater service within the McKinleyville USA. This represents approximately 80% of those who receive water service, and 95% of homes within the USA. Average dry weather flows totaled approximately 0.9 MGD, and peak wet weather flows totaled approximately 2.4 MGD in 2006. This represents a system wide peaking factor of slightly over two – one of the lowest in the County.

##### **Wastewater Collection, Treatment, and Disposal**

The District's wastewater facilities consist of a collection system, a treatment facility, and a disposal system. Wastewater is collected from individual sources throughout the District's service area, and the collection system converges at the Fischer Road Pump Station where it is pumped to the McKinleyville wastewater treatment facilities at Hiller Park. The treatment facilities originally consisted of two primary oxidation ponds with a total area of 11.2 acres (Ponds 1A and 1B), three secondary oxidation ponds with a total area of 8.1 acres (Ponds 2, 3, and 4), a chlorine disinfection system, and an effluent pumping system. The facility was originally designed as a

facultative lagoon system. Twelve 5 HP aerators, five each in Ponds 1A and 1B and two in Pond 2 provide additional oxygen for treatment and odor control. In general, the aerators are only used during summer months, when temperatures are warmer, to keep the surface of the primary ponds aerobic; hours are reduced for winter periods.

The facility was upgraded in 2005 as part of a compliance project in response to a series of effluent violations as outlined in Administrative Civil Liability Order No. R1-2006-0034. One of the secondary oxidation ponds was converted into a constructed wetland, and a new constructed wetland pond was added to the treatment train. Full maturity of the wetland plants and maximum treatment levels are not expected to be attained until 2008. Biological treatment capacity of the facility is 1.18 MGD, and the hydraulic capacity of the disinfection facilities (chlorine contact chamber) is estimated at 3.3 MGD, about 2,300 gallon per minute peak flow (the present NPDES permit limits chlorine contact chamber peak flows to 2,236 gpm).

Treated wastewater is discharged to the Mad River during winter months when the river flow rate surpasses 200 cfs (cubic feet per second). During summer months (May 15<sup>th</sup> through September 30<sup>th</sup>) and low flow periods of the Mad River, treated wastewater is discharged into either of two percolation ponds located adjacent to the river, flood irrigated to several rapid infiltration basins, or is irrigated on dairy pastures southwest of McKinleyville and in the Arcata bottoms. The irrigated areas include 105 acres of the Fisher Ranch property, 40 acres of the Pialorsi Ranch adjacent to the District property, 40 acres of the Rylander property adjacent to Hiller Park and 103 acres of the Homen Ranch south of the Mad River is also available.

## Condition Assessment

**Overview.** MCSD's wastewater system is in overall very good condition. The District has experienced dry weather wastewater disposal problems in the recent past during low flow periods in the Mad River when the District relies solely on land application for disposal. The District has also been involved in extensive efforts to reduce inflow and infiltration during wet weather and experiences some of the lowest I&I rates in the County. No surcharging currently occurs within the collection system. MCSD is presently at about 76% of permitted through-flow/discharge quantities at its treatment facilities.

**Current Deficiencies.** Some of the District's main trunk lines, such as the Thiel Avenue line under Hiller Park and the Widow White Creek line under the freeway, are nearing capacity. The District is considering adding additional capacity, either by addition of parallel lines or pulling and replacing the existing lines. Some lines are also being considered for pipe bursting.

**Underserved Areas.** All areas within the USA receive wastewater service.

## Proposed Improvements

**System Upgrades.** As described above, the District is currently investigating improvements to some main trunk lines to increase capacity and reduce inflow and infiltration. Pump station upgrades are also being planned. The Letz Lane pump station is in need of additional pumping capacity. The pump station at the existing WWTF is not currently having problems, but if flows from the Letz Lane pump station increase, then pumping capacity at the WWTF will also have to be increased. The District is also interested in upgrading their wastewater computer model to better understand tradeoffs associated with various proposed improvements.

**Future Expansion.** The area immediately north of the Norton and Airport Road intersection, as addressed in the McKinleyville Community Plan is an area of eventual expansion for sewer service. This would include a sewer collection system extending north up to Grange Road on

Central Avenue and Dows Prairie Road. Sewer flows would be south toward Murray Road. A sewer force main and pump station in the Murray Road area would be constructed to pump flow toward the treatment plant via the Letz pump station or construct a new crossing under Highway 101 in the Murray Road area. The preferred alignment will be determined by engineering and cost analysis. The wastewater treatment plant would need to be expanded to accommodate this new capacity requirement.

This Assessment Zone would need to be voted upon by the residents of the area to provide the capital to construct the needed improvements.

**Cost and Schedule of Improvements.** The District updates its ten-year CIP every year and last did so in 2007. Planned and scheduled improvements include expansion of the Collection system in the Thiel Road area and highway under-crossing. The Hiller sewer lift station will add pumping capacity as growth requires. The wastewater treatment plant will be expanded as conditions require and modification will be required to meet the California Toxic Rule implementation date of May 2010. These projects will be designed and engineered in response to growth and the regulatory environment.

#### **7.4.9. Miranda USA**

The Miranda USA is served by a community sewer system owned and operated by the Miranda Community Services District (MCSD). A high build-out estimate for total development potential of 74 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.10 for a more detailed description of the Miranda USA and its development potential.

##### **7.4.9.1. Summary**

###### **Findings**

Miranda's wastewater system is in good condition but will likely face increasing regulatory difficulties over its method of summertime disposal. The wastewater system consists of small diameter gravity sewer mains that collect effluent from septic tanks in the community and direct flows to a recirculating sand filter, followed by disinfection. Disposal consists of percolation ponds on the South Fork Eel River, which will likely not be allowed in the near future during the discharge prohibition period. Miranda will likely have to find alternative methods of summertime disposal, as will all communities in the Eel River Basin that currently rely on this form of disposal. This could prove difficult (and expensive) as much of the nearby land is unsuitable for disposal and suitable land is likely a good distance from the treatment plant.

###### **Existing Capacity**

The system currently has approximately 110 connections, and flows currently range between 0.03 MGD during dry weather and 0.10 MGD during wet weather. The facility has a permitted treatment capacity of 0.046 MGD, and is therefore operating at approximately 65% capacity. Therefore, it is assumed the facility could realize its full average dry weather capacity, allowing for an additional 59 connections.

###### **Summary of Required Improvements**

This facility does not require any major improvements and could serve some of the future development except for the issue of being able to continue to use the percolation ponds during the discharge prohibition period (summer). These improvements would serve both existing and future development.

The following table summarizes the infrastructure assessment for the Miranda USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 7-10. Wastewater system infrastructure assessment for the Miranda USA.**

<b>WASTEWATER SYSTEM STATISTICS</b>	
# of Existing Connections	110
# of Available Connections <sup>1</sup>	59
Permitted Dry Weather Treatment Capacity (MGD)	0.046
Existing Dry Weather Flows (MGD)	0.03
Existing Peak Wet Weather Flows (MGD)	0.10
I&I Peaking Factor	3 – 4
<b>LOW &amp; HIGH BUILD-OUT ESTIMATES</b>	
# of Projected New Connections <sup>1</sup>	48 – 74
# of Total Future Connections	158 – 184
Needed Infrastructure Upgrades	Estimated Cost (\$)
<i>Collection System I&amp;I Upgrades</i>	\$1,000,000
<i>Alternative (Summer) Disposal Method</i>	\$3,000,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	
<b>\$4,000,000</b>	
<b>Est. Cost per Existing Connection (\$)</b>	
<b>\$36,364</b>	
<b>Est. Financing Cost per Existing Connection (\$/Month)</b>	
<b>\$194.39</b>	
<b>Est. Range of Costs per Total Future Connection (\$)</b>	
<b>\$21,739 - \$25,317</b>	
<b>Est. Financing Cost per Total Future Connection (\$/Month)</b>	
<b>\$116.21 - \$135.33</b>	

NOTES: <sup>1</sup> The number of available connections was estimated based on the District's current ADWF being at 65% of capacity as set forth in their NPDES permit.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$4,000,000 loan would amount to approximately \$257,000 per year. With 110 existing connections, monthly bills would have to be increased by \$194 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by over \$116 per month to fund this loan. Therefore, monthly bills would have to increase between \$116 and \$194 per month to fund these wastewater improvements. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

## **7.4.9.2. Wastewater System**

### **Service Area Description**

All proposed development within the Miranda USA would receive wastewater service from the MCSD. The District operates and maintains a collection, treatment, and disposal system.

### **System Standards**

The District's wastewater system is a public system and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The District's current waste discharge requirements are contained in RWQCB Order No. R1-2003-0008. The District does not have an NPDES permit as they do not directly discharge to the Eel River, but rather discharge year-round to percolation ponds. Standards for percolation ponds are currently changing, and this type of discharge will likely not be allowed during the discharge prohibition period in the very near future.

### **Fiscal Condition/Capital Replacement Program**

According to District records, they operate their wastewater system on an annual budget of approximately \$57,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District has not developed a Capital Improvement Plan to date, and they currently do not have built up reserves.

### **Wastewater Flows**

Approximately 110 connections currently receive wastewater service within the Miranda USA, all of which are residential connections. Approximately 50% of homes within the USA are serviced. Average dry weather flows are estimated at approximately 30,000 gpd (Miranda CSD, 2007). Peak wet weather flows are estimated at approximately 100,000 gpd (Ristow, 2007). This represents a system wide peaking factor of approximately three.

### **Wastewater Collection, Treatment, and Disposal**

Miranda CSD's collection system consists of small diameter, gravity sewers that collect effluent from individual septic tanks in the community. The system is a combined septic tank effluent gravity and pump system (STEG/STEP). Approximately ten septic tanks within the community are outfitted with pumps. The treatment and disposal system consists of a recirculating sand filter, disinfection, and a percolation pond located approximately 100 yards from the South Fork Eel River.

The treatment plant has a dry weather design capacity of 46,000 gpd, as set forth in their waste discharge requirements.

### **Condition Assessment**

**Overview.** The District's collection system and treatment system are in generally good condition. The District estimates the treatment system is currently operating at approximately 65% of its design capacity.

The District currently relies on percolation ponds for disposal. This form of disposal is becoming increasingly difficult to permit due to stringent regulations governing disposal to the South Fork

Eel River during the discharge prohibition period. Other communities such as Rio Dell and Ferndale are being required by the RWQCB at this time to find alternative methods of disposal.

**Current Deficiencies.** The District does not have any significant deficiencies at this time. I&I within the collection system will need to be addressed. In addition, summertime disposal through their percolation ponds will likely become increasingly difficult to permit in the near future.

**Underserved Areas.** All areas within the USA receive wastewater service from the District.

### **Proposed Improvements**

**System Upgrades.** The District does not have plans for any system upgrades at this time aside from scheduled improvements to the collection and treatment systems.

**Future Expansion.** The District is not interested in expanding services or District boundaries but feels capable of serving additional growth at the current rate of development.

**Cost and Schedule of Improvements.** The District does not have a CIP in place at this time.

## **7.4.10. Orick USA**

Orick's commercial center and surrounding residential areas comprise the Orick USA. Although the USA does not currently have a community wastewater system, the community has expressed interest in developing such a system. A high build-out estimate for total development potential of 30 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.11 for a more detailed description of the USA and its development potential.

### **7.4.10.1. Summary**

#### **Findings**

Orick has been in the process of evaluating alternatives for a community wastewater system for a number of years now. Pollution from failing septic tanks has been found to be widespread and contaminating local groundwater sources. A report titled Feasibility Study – Wastewater Collection, Treatment and Disposal was completed in September 2004 by SHN Consulting Engineers & Geologists, Inc. as part of a Housing and Community Development Block Grant. However, Orick is still investigating collection, treatment, and disposal alternatives for the community. The community has received Proposition 50 funding to assist with the project.

The system is forecast to have approximately 144 connections (245 EDUs), and flows are expected to range between an average dry weather flow of 29,400 gpd to a peak day average flow of 102,532 gpd (SHN, 2004).

#### **Summary of Required Improvements**

The following table summarizes the infrastructure assessment for the Orick USA and addresses infrastructure needs for existing development and for build-out conditions. It is assumed that a new wastewater collection, treatment and disposal system will be sized to accommodate both existing and all future development.

**Table 7-11. Wastewater system infrastructure assessment for the Orick USA.**

<b>WASTEWATER SYSTEM STATISTICS</b>	
# of Existing Connections	0
# of Available Connections <sup>1</sup>	According to design
<b>LOW &amp; HIGH BUILD-OUT ESTIMATES</b>	
# of Projected Connections <sup>1</sup>	144
Needed Infrastructure Upgrades	Estimated Cost (\$)
<i>New Collection System</i>	\$4,000,000
<i>New Treatment System</i>	\$2,000,000
<i>New Disposal System</i>	\$1,000,000
<b>Secured Grant Funding (\$)</b>	<b>\$2,500,000</b>
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$4,500,000</b>
<b>Est. Cost per Total Future Connection (\$)</b>	<b>\$31,250</b>
<b>Est. Financing Cost per Total Future Connection (\$/Month)</b>	<b>\$167.05</b>

NOTES: <sup>1</sup> The wastewater treatment plant is being designed to serve an estimated 144 connections.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$4,500,000 loan would amount to approximately \$289,000 per year. With 144 potential connections, monthly bills would have to be approximately \$167 per month to fund this loan. In reality, this is clearly unaffordable and the District would have to obtain additional grant funding to reduce the local cost.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **7.4.10.2. Wastewater System**

##### **Service Area Description**

All existing development within the USA currently relies on on-site septic systems for wastewater treatment and disposal. However, the community has recently expressed interest in developing a community-wide system to collect, treat, and dispose of wastewater. The community has received Proposition 50 funding for the system, and is in the process of identifying a preferred consultant to prepare studies and identify an alternative best suited for the community. They are evaluating several alternatives, including a wetland system and a STEP system. Under the new system, all potential development within the downtown portion of the Orick USA would receive wastewater service from the Orick Community Services District (OCSD). Extension of services to the northern portion of the Orick USA would require additional planning and consideration by the OCSD. The construction of a community system would also foster growth and development within the USA.

##### **System Standards**

The District's proposed wastewater system would be a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

## **Fiscal Condition/Capital Replacement Program**

The District should investigate grant funding for a community wastewater system. Potential grant funding sources are summarized in Section 12.2.5

## **Wastewater Flows**

The community system would likely serve approximately 140 connections within the Orick USA, of which approximately 85% would be residential connections. It is estimated that average dry weather flows would amount to approximately 29,400 gpd, and peak day average flows would be approximately 102,532 gpd. I&I would be low for such a new collection system (SHN, 2004).

## **Wastewater Collection, Treatment, and Disposal**

The District will soon be completing a supplemental facilities plan and will be selecting a wastewater collection, treatment and disposal system. Following completion of the facilities plan and a CEQA review, a Report of Waste Discharge will need to be filed with the RWQCB prior to permit approval. It is expected the process will take five to ten years.

## **Proposed Improvements**

**System Upgrades.** The District is proposing a community wastewater system for the Orick USA.

**Future Expansion.** A community system would facilitate growth and development in the future. The OCSD is proposing to provide service the households and businesses currently served by its domestic water system. Extension of wastewater service to the northern portion of the Orick USA would require additional planning and consideration by the OCSD.

**Cost and Schedule of Improvements.** It is estimated that the collection, treatment, and disposal facilities would cost approximately \$7 million.

## **7.4.11. Redway USA**

Redway's commercial downtown area and surrounding residential areas comprise the Redway USA. The Redway USA is served by a community sewer system owned and operated by the Redway Community Services District (RCSD). A high build-out estimate for total development potential of 589 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.12 for a more detailed description of the USA and its development potential.

### **7.4.11.1. Summary**

#### **Findings**

Redway's wastewater system is in fair condition overall but is currently under an ACLO for effluent limit violations. The treatment capacity of the facility is likely being exceeded, as most of the violations entailed suspended solids and total coliform exceedance of the maximum permitted value and not deficiencies in percent removal generally related to wet weather flows and excessive dilution. The District's compliance project involves converting a clarifier to a sludge thickener with the hopes of improving suspended solids removal and general performance at the plant. The District's collection system also experiences moderate I&I, which is proposed to be addressed over the coming years.

## Existing Capacity

The system currently has approximately 524 connections, and flows currently range between 0.14 MGD during dry weather and 0.43 MGD during wet weather. The facility has a permitted dry weather capacity of 0.186 MGD and wet weather capacity of 0.64 MGD, and is therefore operating at approximately 75% capacity with respect to both dry weather and wet weather capacities. Therefore, the facility has capacity for an additional 175 connections.

## Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Redway USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 7-12. Wastewater system infrastructure assessment for the Redway USA.**

<b>WASTEWATER SYSTEM STATISTICS</b>	
# of Existing Connections	524
# of Available Connections <sup>1</sup>	175
Permitted Dry Weather Treatment Capacity (MGD)	0.186
Permitted Wet Weather Treatment Capacity (MGD)	0.64
Existing Dry Weather Flows (MGD)	0.14
Existing Peak Wet Weather Flows (MGD)	0.43
I&I Peaking Factor	3
<b>FULL BUILD OUT</b>	
# of Projected New Connections	298 – 589
# of Total Future Connections	822 – 1,113
Proposed Infrastructure Upgrades	Estimated Cost (\$)
Upgrade treatment facility	\$3,000,000
Collection System I&I Upgrades	\$2,000,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$5,000,000</b>
<b>Est. Cost per Existing Connection (\$)</b>	<b>\$9,542</b>
<b>Est. Financing Cost per Existing Connection (\$/Month)</b>	<b>\$51.01</b>
<b>Est. Range of Costs per Total Future Connection (\$)</b>	<b>\$4,492 - \$6,083</b>
<b>Est. Financing Cost per Total Future Connection (\$/Month)</b>	<b>\$24.01 - \$32.52</b>

NOTES: <sup>1</sup> The number of available connections was estimated based on the District's current ADWF being at 75% of capacity as set forth in their NPDES permit.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$5,000,000 loan would amount to approximately \$321,000 per year. With 524 existing connections, monthly bills would have to be increased by approximately \$51 per month to fund this loan. If the loan were to be spread out over high future build-out as well, monthly bills would have to be increased by approximately \$24 per month to fund this loan. Therefore, monthly bills would have to increase between \$24 and \$51 per month to fund these wastewater improvements. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **7.4.11.2. Wastewater System**

##### **Service Area Description**

All potential development within the Redway USA would receive wastewater service from the Redway Community Services District (RCSD).

##### **System Standards**

The District's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The District's current waste discharge requirements are contained in RWQCB Order No. R1-2006-0022 and NPDES Permit No. CA0022978. The District is under Administrative Civil Liability Order No. R1-2007-0010 for BOD and TSS effluent limit violations.

##### **Fiscal Condition/Capital Replacement Program**

According to District records, they operate their wastewater system on an annual budget of approximately \$286,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District's latest Capital Improvement Plan was developed in 2006, and they currently have \$281,500 in reserves.

##### **Wastewater Flows**

Approximately 524 connections receive wastewater service within the Redway USA, of which approximately 80% are residential connections (Humboldt County LAFCO, 2004). This represents approximately 82% of those who receive water service, and 93% of homes within the District. Average dry weather flows currently amount to approximately 140,000 gpd (Redway CSD, 2007). Peak wet weather flows are estimated at approximately 470,000 gpd (Harrington-Dean, 2007).

##### **Wastewater Collection, Treatment, and Disposal**

The Redway CSD's collection system incorporates both gravity mains and five lift stations, and one aerial crossing to connect the Eel River Conservation Camp to the Redway WWTP. The WWTP includes a 300,000 gallon oxidation ditch, clarification, and a chlorination/dechlorination system. Effluent is primarily discharged to upland percolation ponds located on land owned by the District, but flows to these ponds are limited by transmission capacity. Therefore, when wintertime flows exceed 0.350 MGD, effluent flows are diverted to the Eel River for disposal. Dried sludge is buried on land near the plant that is also owned and controlled by the District.

The District's NPDES Permit states that the WWTP has a dry weather design flow of 0.186 MGD and a peak wet weather design flow of 0.615 MGD.

## Condition Assessment

**Overview.** The District is very near capacity at its WWTP. They are currently under an ACLO for effluent limit violations, indicating that loading at the WWTP is currently exceeding its treatment capacity. The facility is currently operating at approximately 75% of its hydraulic capacity with respect to both dry and wet weather flows.

**Current Deficiencies.** The District's collection system experiences significant I&I during winter months. The District plans on improving its collection system over the next five years to reduce I&I in the system.

**Underserved Areas.** Not all areas within the District receive wastewater service.

## Proposed Improvements

**System Upgrades.** The District is in the process of planning improvements to the WWTP as part of a compliance project for its current ACLO. The project will entail converting an old clarifier into a sludge thickener which is intended to reduce or eliminate effluent limit violations. The project must be completed by November 2007. The District also plans on reviewing and improving the collection system to reduce I&I.

**Future Expansion.** The District has no major plans for expansion other than servicing additional growth at existing rates of development. The entire USA is within the Redway CSD boundaries or SOI. Proponents of new development within the SOI would need to seek LAFCo approval to annex to the Redway CSD.

**Cost and Schedule of Improvements.** The District does not have a CIP in place at this time.

## 7.4.12. Rio Dell USA

There are two areas within the City's sphere of influence that comprise the Rio Dell USA. A high build-out estimate for total development potential of only 8 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.13 for a more detailed description of the USA and its development potential.

### 7.4.12.1. Summary

#### Findings

Rio Dell's wastewater system is in fair condition overall and is currently under both a CDO for summertime disposal and an ACLO for effluent violations. The City is actively exploring options for summertime disposal and is currently completing a Wastewater Effluent Disposal Facilities Plan in hopes of securing funding for alternative disposal methods. The City is also upgrading its treatment plant as part of a compliance project of the ACLO. The City's collection system also experiences significant I&I, which they will be addressing over the coming years.

#### Existing Capacity

Availability of connections within the City of Rio Dell's wastewater system is not as straightforward as with the water system. The system currently has approximately 1,310 connections, and flows currently range between 0.43 MGD during dry weather and 2.82 MGD during wet weather conditions. The facility has a permitted dry weather capacity of 0.9 MGD, and is therefore operating at approximately 48% capacity with respect to its dry weather capacity. However, wet weather flows (I&I) are excessive and need to be addressed. Therefore, available capacity is estimated to be near zero until these problems are resolved. With

improvements to the treatment system and reduction in I&I, the City's wastewater system could likely realize its full dry weather capacity, allowing for 1,419 additional connections.

### Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Rio Dell USA and addresses infrastructure needs for existing development and for build-out conditions. The planned improvements are assumed to be able to handle both existing and future development.

**Table 7-13. Wastewater system infrastructure assessment for the Rio Dell USA.**

<b>WASTEWATER SYSTEM STATISTICS</b>	
# of Existing Connections	1,310
# of Available Connections <sup>1</sup>	0
Permitted Dry Weather Treatment Capacity (MGD)	0.9
Existing Dry Weather Flows (MGD)	0.43
Existing Peak Wet Weather Flows (MGD)	2.82
I&I Peaking Factor	6 – 7
<b>EXISTING CAPACITY &amp; FULL BUILD OUT</b>	
# of Projected New Connections	2 – 8
# of Total Future Connections <sup>2</sup>	1,312 – 1,318
Needed Infrastructure Upgrades	Estimated Cost (\$)
<i>Collection system upgrades to reduce I&amp;I</i>	\$5,000,000
<i>New disposal facilities</i>	\$15,000,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$20,000,000</b>
<b>Est. Cost per Existing Connection (\$)</b>	<b>\$15,267</b>
<b>Est. Financing Cost per Existing Connection (\$/Month)</b>	<b>\$81.61</b>
<b>Est. Range of Costs per Total Future Connection (\$)</b>	<b>\$15,174 - \$15,244</b>
<b>Est. Financing Cost per Total Future Connection (\$/Month)</b>	<b>\$81.12 - \$81.49</b>

NOTES: <sup>1</sup> The number of available connections was estimated at zero based on the fact that the City is currently under a Cease and Desist Order.

<sup>2</sup> This number does not include development within City limits.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$20 million loan would amount to approximately \$1.283 million per year. With 1310 existing connections, monthly bills would have to be increased by approximately \$82 per month to fund this loan. Monthly financing would not be lowered significantly due to high build-out estimates in the Rio Dell USA but would be due to additional growth within the City itself. In reality, we would expect the City to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

## **7.4.12.2. Wastewater System**

### **Service Area Description**

All potential development within the Rio Dell USA would receive wastewater service from the City of Rio Dell upon annexation. The City's existing service area includes all lands within the City limits.

### **System Standards**

The City of Rio Dell's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The City's current waste discharge requirements are contained in RWQCB Order No. R1-2006-0021, NPDES Permit No. CA0022748. The City is currently under Cease and Desist Order No. R1-2005-0034, and was more recently issued Administrative Civil Liability Order No. R1-2007-0042.

### **Fiscal Condition/Capital Replacement Program**

According to City records, they operate their wastewater system on an annual budget of approximately \$575,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are accumulated through revenues for vehicles and other specialty equipment but not for water infrastructure. The City has not developed a CIP to date, and they currently have not built up reserves.

### **Wastewater Flows**

Approximately 1,310 units receive wastewater service within the City of Rio Dell (Winzler & Kelly, 2007). Approximately 94% of these connections are residential and the remaining 10% are commercial and institutional. Average dry weather flows totaled approximately 0.430 MGD, while peak wet weather flows totaled approximately 2.820 MGD in 2005 (Winzler & Kelly, 2006). This represents a system wide peaking factor of approximately six to seven.

### **Wastewater Collection, Treatment, and Disposal**

Wastewater is collected throughout the City's collection system and flows to the WWTP. The City's WWTP consists of a flow-metering flume, primary clarification, secondary treatment by rotating biological contactors, secondary clarification, and chlorination/dechlorination. Sludge is digested aerobically and dried on sludge drying beds before being land applied. Treated wastewater is discharged to the South Fork Eel River between October 1 and May 15 of each year, and to percolation ponds during the discharge prohibition period. The City's facility has a design flow of 0.9 MGD.

The City is currently exploring irrigation options for summertime discharge as part of a Wastewater Effluent Disposal Facilities Plan being prepared to meet the SWRCB's Small Community Wastewater Grant Guidelines.

### **Condition Assessment**

**Overview.** The City has made significant improvements to its water system in recent years, and is now focusing to improve its wastewater collection, treatment and disposal systems. Overall, the wastewater system is in fair condition and requires significant upgrades to address existing and near term future regulations.

The City is currently under a Cease and Desist Order for its use of percolation ponds as a summertime disposal method. The City is in the process of actively exploring alternative disposal methods and funding mechanisms. The City is also considering the construction of a new WWTP as a part of their evaluation of disposal alternatives.

The City is also under Administrative Civil Liability Order for effluent violations to the discharge requirements. A compliance project has been agreed upon, which includes automation of the City's chlorination and dechlorination facilities. The project must be completed by February 2008.

**Current Deficiencies.** The City's summertime disposal method will become increasingly difficult to permit. Therefore, the City has been exploring other disposal options including land irrigation. The City has also had trouble meeting its effluent discharge requirements and is completing a compliance project to improve performance of the treatment plant.

**Underserved Areas.** All areas within the City receive wastewater service.

### **Proposed Improvements**

**System Upgrades.** As described above, the City is currently developing a Wastewater Effluent Disposal Facilities Plan to meet the City's long-term wastewater treatment and disposal needs and the requirements of the RWQCB. The City is currently pursuing the reuse of treated effluent for irrigation of pastureland in Metropolitan (preferred alternative), although irrigation in Scotia is also being considered. The City is also investigating both upgrading the existing treatment system and construction of a new treatment system. The plan is being prepared to meet the SWRCB's Small Community Wastewater Grant (SCWG) Guidelines.

The City has developed a CIP to address shortfalls within their wastewater collection system. The City is poised to invest significant effort and resources to reduce I&I within their collection system.

**Future Expansion.** The City of Rio Dell is looking to annex the USAs within the time frame of this General Plan. Rio Dell requires all proposed annexations to be up to the City's sewer/water/roads standards and would require a new assessment District where there are deficiencies.

**Cost and Schedule of Improvements.** The City of Rio Dell recently developed a five year Capital Improvement Plan in 2006 that covers costs and schedules for improvements to its wastewater collection and treatment system. Scheduled improvements include automatic solids removal at the head works, refurbishing the rotating biological contactors, disinfection of pumps, replacing stand by generator switching equipment, a fuel storage system, and alarm and control panels. These improvements are estimated at approximately \$256,500. Other collection system improvements have been identified by staff as less critical.

### **7.4.13. Samoa USA**

The small residential and industrial area just north of the LP Samoa pulp mill and south of the intersection of New Navy Base Road and Cookhouse Road comprise the Samoa USA. The proposed Samoa Town Master Plan developed by Samoa Pacific Group LLC comprises the Samoa USA. A high build-out estimate for total development potential of 318 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.14 for a more detailed description of the USA and the proposed Samoa Town development.

### 7.4.13.1. Summary

#### Findings

Samoa's existing wastewater facilities are in poor condition. The entire system will be upgraded and expanded as part of the Samoa Town Master Plan proposed development. The existing collection system will be upgraded, and a new collection system installed for any new development. New treatment and disposal facilities will also be constructed. Treatment will likely consist of some mechanical treatment technology, such as a Sequencing Batch Reactor. Disposal will likely consist of discharge to leaky wetlands.

The system is forecast to serve approximately 350 new connections in addition to the approximately 104 existing connections. Flows are expected to range between an average dry weather flow of 0.2 MGD to a peak hourly flow of 1.0 MGD (Winzler & Kelly, 2003).

#### Existing Capacity

Availability of connections within the Town of Samoa wastewater system is not as straightforward as with the water system. The system currently has approximately 104 connections. Flows are currently not metered and it has been estimated that they are around 0.02 MGD during dry weather. Samoa Pacific Group, LLC recognizes that the existing wastewater collection, treatment and disposal system will need significant replacement and upgrades to support their future development plan. We estimate that there is a limited amount of capacity in the existing system. A more detailed analysis, which is beyond the scope of this effort, would be needed to quantify how much existing capacity currently exists.

#### Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Samoa USA and addresses infrastructure needs for existing development, for planned developments in the USA within the next 10-year planning horizon, and for build-out conditions.

**Table 7-14. Wastewater system infrastructure assessment for the Samoa USA.**

<b>HIGH BUILD-OUT ESTIMATE <sup>1</sup></b>	
# of Existing Connections	104
# of Projected New Connections	318
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>New Collection System</i>	<i>\$Unknown</i>
<i>New Treatment System</i>	<i>\$1,200,000</i>
<i>New Disposal System</i>	<i>\$1,200,000</i>
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	
<b>Est. Cost per Existing Connection (\$)</b>	
<b>Est. Financing Cost per Existing Connection (\$/Month)</b>	
<b>Est. Range of Costs per Total Future Connection (\$)</b>	
<b>Est. Financing Cost per Total Future Connection (\$/Month)</b>	

NOTES: <sup>1</sup> Existing wastewater system statistics are not shown because under the proposed development, all wastewater facilities (collection, treatment, and disposal) will be new.

It is uncertain at this point what new wastewater infrastructure for the Samoa USA will cost. However, most likely these costs will be borne by the developer. All connections will need to buy into the infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. Specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

### **7.4.13.2. Wastewater System**

#### **Service Area Description**

There are currently two permitted wastewater treatment and disposal facilities serving the town of Samoa. The north system serves about 25 residences and consists of a 15,000 gallon septic tank and leachfield. The south system serves about 75 residences, the Samoa Block, Hostelry, and the Samoa Cookhouse through a series of septic tanks, bark filters, a treatment pond/wetland, and approximately 2.5 acres of infiltration area.

All existing and potential development within the Samoa USA would receive wastewater service from a proposed management entity formed by the Samoa Pacific Group, LLC. The entity's proposed service area would include both existing and proposed residences within the USA.

#### **System Standards**

The future wastewater system would be a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

#### **Fiscal Condition/Capital Replacement Program**

The wastewater system will be constructed as part of the Samoa Town development.

#### **Wastewater Flows**

The community system would serve approximately 454 connections within the Samoa USA, of which approximately 99% would be residential connections. It is estimated that average dry weather flows would amount to approximately 0.2 MGD. Peak hourly flowrates are estimated at 1 MGD, using a peaking factor of 5 (Winzler & Kelly, 2003). I&I would be low for such a new collection system.

#### **Wastewater Collection, Treatment, and Disposal**

Winzler & Kelly investigated treatment and disposal options for the Samoa Town Master Plan in 2003. The study recommended use of a mechanical treatment system, such as a sequencing batch reactor, to treat the wastewater and remove nutrients to the maximum extent practicable for land disposal. Due to the small size of the development and low flows, a packaged treatment plant could likely be found. The recommended disposal method was discharge to leaky wetlands (Winzler & Kelly, 2003). This form of disposal is not expected will be considered a prohibited direct discharge during summer months due to the discharge location's distance from the Bay.

#### **Condition Assessment**

**Overview.** The Samoa Pacific Group will be responsible for construction of the collection, treatment, and disposal facilities. At this point, it is unclear what type of entity will operate and maintain these systems.

**Current Deficiencies.** The existing collection system experiences significant I&I during winter months. The system will be upgraded as part of the proposed development.

**Underserved Areas.** All areas within the USA will receive wastewater service from a newly formed management entity.

## Proposed Improvements

**System Upgrades.** As described above, the Samoa Pacific Group will be responsible for upgrading and expanding the collection system and construction of new collection, treatment and disposal facilities as part of the development proposal.

**Future Expansion.** The Samoa Town Master Plan is the only expansion planned for the USA.

**Cost and Schedule of Improvements.** There is no plan to date that covers costs and schedules for improvements to the wastewater system. It is unclear at this time how much the town's wastewater system will cost to construct.

### 7.4.14. Scotia USA

Scotia's town center and surrounding residential areas comprise the Scotia USA. The County has not prepared development estimates for the USA to date, as the town is still owned by PALCO and not zoned. However, PALCO is currently in the process of subdividing the town so that individual lots can be sold. See Section 6.4.15 for a more detailed description of the USA.

#### 7.4.14.1. Summary

##### Findings

Scotia's wastewater system is in poor condition. The WWTP is located within the 100-year floodplain. The treatment capacities of multiple unit processes within the facility are exceeded even by average day maximum month flows (Winzler & Kelly, 2006). However, under current conditions the three treatment ponds at the WWTP provide the necessary treatment to meet current permit conditions (SHN, 2007). Since October 2006 the facility has been operating under a new NPDES permit and to date has met the WWTP permit treatment requirements. Prior to the permit going into effect however there was concern that the facility would not meet the secondary treatment standards for 85% removal of BOD and TSS. PALCO requested the facility be placed under a Cease and Desist Order (CDO) that set forth a time schedule for compliance with the BOD and TSS percent removal permit requirements. The Scotia WWTP currently discharges to percolation ponds adjacent to the Eel River during the summertime discharge prohibition period. The town will likely have to find alternative methods for summertime disposal, as percolation ponds on the Eel River are becoming more difficult to permit with time.

##### Existing Capacity

The system currently has approximately 295 connections, and flows currently range between 0.178 MGD during dry weather and 0.287 during wet weather conditions, with peak flows up to 1.4 MGD. The facility does not currently have a permitted design capacity as part of its waste discharge requirements, but has been ordered to evaluate the hydraulic and biological treatment capacities of the facility by 2010 as part of the CDO. According to a capacity evaluation performed as part of the annexation study, the facility was found to not have sufficient capacity to meet maximum month average flows. Although the annexation study found the facility did not have sufficient capacity, it is important to note that there are also three treatment ponds that are currently functioning as part of the permitted wastewater treatment system. With the inclusion of the treatment ponds, the WWTP system has sufficient capacity under existing conditions and has consistently met secondary treatment requirements as outlined in the current NPDES permit. However, all of these improvements are located within the 100 year flood plain.

## Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Scotia USA and addresses infrastructure needs for existing development and for build-out conditions. PALCO has indicated that it has no interest in developing new residential housing, although they are interested in converting Mill A to other light industrial and commercial uses.

**Table 7-15. Wastewater system infrastructure assessment for the Scotia USA.**

<b>WASTEWATER SYSTEM STATISTICS</b>	
# of Existing Connections	295
# of Available Connections <sup>1</sup>	0
Permitted Dry Weather Treatment Capacity (MGD) <sup>1</sup>	None available
Existing Dry Weather Flows (MGD)	0.178
Existing Peak Wet Weather Flows (MGD)	1.4
I&I Peaking Factor	7 – 8
<b>EXISTING CAPACITY &amp; FULL BUILD OUT</b>	
# of Projected New Connections <sup>2</sup>	0
Needed Infrastructure Upgrades	Estimated Cost (\$)
Collection System Upgrades	\$4,000,000
WWTP Upgrades (Primary & Secondary Clarifiers/Trickling Filters)	\$7,000,000
New disposal facilities	\$5,000,000
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$16,000,000</b>
<b>Est. Cost per Existing Connection (\$)</b>	<b>\$54,237</b>
<b>Est. Financing Cost per Existing Connection (\$/Month)</b>	<b>\$289.93</b>

NOTES: <sup>1</sup> The number of available connections was estimated at zero until waste discharge requirements are established for the facility.

The above estimated costs are based upon assumptions and the actual costs will be different. With a lack of reserves in place, funding for infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. At this rate, annual payments for a \$16 million loan would amount to approximately \$1.026 million per year. With only 295 existing connections, monthly bills would have to be increased by approximately \$290 per month to fund this loan. In reality, we would expect the Owner to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale. Additional development in the area would be another method for spreading these costs over a larger ratepayer base.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. Site specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **7.4.14.2. Wastewater System**

##### **Service Area Description**

It is unclear at this time what management entity would serve existing and potential development within the Scotia USA with wastewater service. PALCO currently serves Scotia's industrial operations, commercial businesses, and residences and is interested in selling the commercial and residential buildings within the town, including the wastewater collection and treatment systems. Options for the management of the wastewater system include annexation to the City of Rio Dell and formation of a new Community Services District (CSD), as well as a Home Owners Association and private utilities. This issue is currently under review by LAFCO.

##### **System Standards**

PALCO's wastewater system currently is a private system but must still be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

PALCO's current waste discharge requirements are contained in RWQCB Order No. R1-2006-0020 and NPDES Permit No. CA0006017. PALCO's WWTP is also currently under Cease and Desist Order No. R1-2006-0073, which sets forth a time schedule for compliance with BOD and TSS percent removal regulations.

##### **Fiscal Condition/Capital Replacement Program**

This will be a critical issue for the subdivision of the town to proceed so that the owners of the new parcels will have sufficient income to fund on-going operations, maintenance and the building of a capital reserve fund to meet future needs. Currently, this issue, along with the other issues related to the subdivision of the town is before LAFCO.

##### **Wastewater Flows**

Approximately 295 connections currently receive wastewater service within the Scotia USA, of which approximately 92% are residential connections. This represents 100% of those who receive water service, and 100% of homes within the service area. Average dry weather flows currently amount to approximately 0.178 MGD, while peak wet weather flows are estimated at approximately 1.4 MGD (Winzler & Kelly, 2006). This represents a system wide peaking factor of approximately eight.

##### **Wastewater Collection, Treatment, and Disposal**

Scotia's collection system consists of approximately five miles of gravity sewer mains and two lift stations. The WWTP is currently located within the 100 year flood plain of the South Fork Eel River and consists of headworks (screening, grinding, and grit removal), a primary clarifier, a redwood media trickling filter, a secondary clarifier, a chlorine contact chamber, three treatment/polishing ponds, and an anaerobic sludge digester. Disposal to the Eel River occurs between October 1<sup>st</sup> and May 14<sup>th</sup>. The facility discharges to a percolation pond located on the river bar during the summer discharge prohibition period, from October 1<sup>st</sup> to May 15<sup>th</sup>.

The design capacity of the facility is currently not known, and as part of the facility's existing Cease and Desist Order, PALCO is to perform a special study to evaluate the hydraulic and biological treatment design capacity of the facility. These studies are not expected to be finalized until 2010. However, a capacity analysis was performed as part of the annexation study. This study found that a number of unit processes' treatment capacity are exceeded even under average day maximum month flows (Winzler & Kelly, 2006). The study estimated the treatment

capacity at between 0.30 and 0.35 MGD, and the hydraulic capacity between 1.0 MGD and 1.5 MGD.

### **Condition Assessment**

**Overview.** Based on the annexation study results Scotia exceeds the treatment capacity of its WWTP quite regularly. However the use of the 3 treatment ponds, which are also located in the 100 year flood plain, is enabling this facility to meet the NPDES permit discharge limitations at the permitted discharge point (SHN, 2007). Since October 2006 the facility has been operating under a new NPDES permit and to date has met the WWTP permit treatment requirements. Prior to the permit going into effect however there was concern that the facility would not meet the secondary treatment standards for 85% removal of BOD and TSS. PALCO requested the facility be placed under a CDO that set forth a time schedule for compliance with the BOD and TSS percent removal permit requirements.

According to the annexation study, the hydraulic capacity of the primary clarifier, the trickling filters, and the secondary clarifier are all currently exceeded by average day maximum month flow (Winzler & Kelly, 2006).

**Current Deficiencies.** Scotia's collection system experiences significant I&I during winter months. The WWTP is located in the 100-year flood plain, which poses significant problems with respect to flooding but also makes funding for improvements more difficult to obtain. Several unit processes at the WWTP are undersized and in need of additional capacity. Scotia's summertime disposal methods will face increasing regulatory scrutiny, and will likely not be allowed in the near future. The current NPDES permit requires completion of a study for an alternative summertime disposal method by 2011.

**Underserved Areas.** All areas within Scotia receive wastewater service.

### **Proposed Improvements**

**System Upgrades.** System upgrades will largely depend on which option PALCO chooses to divest itself of its wastewater infrastructure. Under the proposed annexation alternative, PALCO would be required to upgrade the collection system and WWTP to City standards prior to annexation. Under the CSD alternative, PALCO has proposed making significantly less improvements to their system, as outlined in the MSR. As this issue is still being evaluated by LAFCO, it is unclear at this time what upgrades would be required of PALCO and how they would be funded.

**Future Expansion.** There are no major plans for expansion within the Scotia USA. However, additional development could partially fund some of the required improvements that are needed.

**Cost and Schedule of Improvements.** The Scotia WWTP does not have a formal CIP in place at this time, It is anticipated that this will be developed as the subdivision application moves through the LAFCO approval process.

## **7.4.15. Shelter Cove USA**

Shelter Cove's town center and surrounding residential areas comprise the Shelter Cove USA. The Shelter Cove USA is served by a community sewer system owned and operated by the Resort Improvement District #1 (RID). A high build-out estimate for total development potential of 1,214 new housing units in the USA was used for infrastructure assessment and

recommendations. See Section 6.4.16 for a more detailed description of the USA and its development potential.

### 7.4.15.1. Summary

#### Findings

Shelter Cove's wastewater system is in fair condition overall but is currently under an ACLO for effluent violations. The violations are related to deficiencies in percent removal generally related to wet weather flows and excessive dilution. The District's compliance project involves converting a clarifier to a sludge thickener with the hopes of improving suspended solids removal and general performance at the plant. The District's collection system also experiences significant I&I, which was recently addressed through an ACLO compliance project completed in early 2007.

#### Existing Capacity

The system currently has approximately 415 connections, and flows currently range between 0.1 MGD during dry weather and 0.5 MGD during wet weather. The facility has a permitted dry weather capacity of 0.17 MGD, and is therefore operating at approximately 59% capacity with respect to dry weather capacity. The facility recently completed an ACLO compliance project to address I&I issues within the collection system. If these projects were successful in reducing the I&I sufficiently, the facility could realize its full average dry weather capacity, allowing for an additional 288 connections.

#### Summary of Required Improvements

The following table summarizes the infrastructure assessment for the Shelter Cove USA and addresses infrastructure needs for existing development and for build-out conditions. There are no planned developments within the USA, and therefore infrastructure for the next 10-year planning horizon was not assessed.

**Table 7-16. Wastewater system infrastructure assessment for the Shelter Cove USA.**

<b>WASTEWATER SYSTEM STATISTICS</b>	
# of Existing Connections	415
# of Available Connections <sup>1</sup>	288
Permitted Dry Weather Treatment Capacity (MGD)	0.17
Existing Dry Weather Flows (MGD)	0.1
Existing Peak Wet Weather Flows (MGD)	0.5
I&I Peaking Factor	5
<b>EXISTING CAPACITY &amp; FULL BUILD OUT</b>	
# of Projected New Connections	1,088 – 1,214
# of Total Future Connections	1,503 – 1,629
Needed Infrastructure Upgrades	Estimated Cost (\$)
<i>Treatment plant upgrades</i>	\$ Unknown
<i>Collection system upgrades</i>	\$ Unknown
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	
<b>Est. Cost per Existing Connection (\$)</b>	
<b>Est. Financing Cost per Existing Connection (\$/Month)</b>	
<b>Est. Range of Costs per Total Future Connection (\$)</b>	
<b>Est. Financing Cost per Total Future Connection (\$/Month)</b>	

NOTES: <sup>1</sup> The number of available connections was estimated based on the District's current ADWF being at 59% of capacity as set forth in their NPDES permit.

Due to uncertainties involving Shelter Cove's treatment plant and collection system, costs for future improvements were not estimated. However, funding for this infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. In reality, we would expect the District to apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, we would expect the actual improvements to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. District specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

#### **7.4.15.2. Wastewater System**

##### **Service Area Description**

All potential development within the Shelter Cove USA would receive wastewater service from the Resort Improvement District #1 (RID).

##### **System Standards**

The District's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The District's current waste discharge requirements are contained in RWQCB Order No. R1-2003-0044 and NPDES Permit No. CA0023027. The District is currently under Administrative Civil Liability Order No. R1-2007-0009 for BOD and TSS effluent limit violations, primarily related to excessive I&I during winter storms.

##### **Fiscal Condition/Capital Replacement Program**

According to District records, they operate their wastewater system on an annual budget of approximately \$465,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District recently developed a ten year Capital Improvement Plan in 2006, and they currently have not built up reserves.

##### **Wastewater Flows**

Approximately 393 residential connections and 22 commercial connections receive wastewater service within the Shelter Cove USA (Resort Improvement District #1, 2007). This represents approximately 91% of those who receive water service, and 89% of homes within the USA. Average dry weather flows currently amount to approximately 0.1 MGD, while peak wet weather flows are estimated at approximately 0.5 MGD (Luce, 2007). This represents a system wide peaking factor of approximately five.

## **Wastewater Collection, Treatment, and Disposal**

RID's collection system incorporates both gravity mains and five lift stations. The WWTP consists of coarse screening, two oxidation ditches, two clarifiers, and chlorination/dechlorination facilities. During fall and winter months, the District discharges treated effluent into the surf zone of the Pacific Ocean within the King Range National Conservation Area. During spring and summer months, some or all of the treated effluent receives additional filtration and disinfection prior to being discharged to a storage pond that supplies a spray irrigation system on the District's nine-hole golf course. Sludge is dewatered and transported to the Humboldt County solid waste transfer station for landfill disposal.

According to the District's discharge permit, the WWTP is designed for an average dry weather flow of 0.17 MGD, an average wet weather flow of 0.27 MGD, and a peak wet weather flow of 0.77 MGD.

### **Condition Assessment**

**Overview.** The District is currently under an Administrative Civil Liability Order due to the District's inability to meet percent removal requirements for BOD and TSS. In essence, the influent to the treatment plant is so diluted, it is virtually impossible to meet these requirements. A mandatory compliance project to reduce I&I has been developed with the RWQCB and was recently completed in early 2007. Based on existing flows, the District is approximately at 59% of dry weather treatment capacity and approximately 78% wet weather capacity at its WWTP.

The District last developed a Master Plan Update for its wastewater treatment and disposal facilities in 1997, which outlines necessary improvements to meet different forecasted growth scenarios. The District also developed a ten-year CIP in 2007 to address required maintenance and upgrades to their wastewater system.

**Current Deficiencies.** The District's collection system experiences significant I&I during winter months. The District recently completed a compliance project in early 2007 to reduce I&I in its collection system through manhole inspections and spot repairs.

**Underserved Areas.** All areas within the District receive wastewater service with the exception of those on septic systems.

### **Proposed Improvements**

**System Upgrades.** As described above, the District is in the process of upgrading its collection system to reduce I&I as part of a compliance project for its current ACLO. The project is forecast to be complete by summer 2007. Other CIP projects include investigation into chlorine alternatives and upgrades to existing sewer lift stations.

**Future Expansion.** The District has no major plans for expansion other than servicing additional growth at existing rates of development.

**Cost and Schedule of Improvements.** The District has budgeted approximately \$2.2 million in its CIP for sewer over the next ten years.

## **7.4.16. Weott USA**

Weott's town center and surrounding residential areas comprise the Weott USA. The Weott USA is served by a community sewer system owned and operated by the Weott Community Services

District (WCSD). A high build-out estimate for total development potential of 61 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.17 for a more detailed description of the USA and its development potential.

#### **7.4.16.1. Summary**

##### **Findings**

Weott's wastewater system is in good condition overall. The operation of the facility is occurring well within its design capacity. No orders have been leveled against the District, indicating the facility is meeting its waste discharge requirements. The community has two discharge alternatives available, including direct discharge to the Eel River which is permitted between October 1<sup>st</sup> and May 15<sup>th</sup> and a community leachfield which can be operated year-round. However, since the POTW began operation it has only discharged to the community leachfield.

##### **Existing Capacity**

The system currently has approximately 134 connections, and flows currently range between 0.014 MGD during dry weather and 0.03 MGD during wet weather. The facility has a permitted dry weather capacity of 0.03 MGD, and is therefore operating at approximately 47% capacity. Therefore, the system has capacity for an additional 151 connections.

##### **Summary of Required Improvements**

The system currently is operating without any problems and no improvements are planned. Future development within the service area can be served by the existing facilities.

#### **7.4.16.2. Wastewater System**

##### **Service Area Description**

All potential development within the Weott USA would receive wastewater service from the Weott Community Services District (WCSD).

##### **System Standards**

The District's wastewater system is a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

The District's current waste discharge requirements are contained in RWQCB Order No. R1-1994-0032.

##### **Fiscal Condition/Capital Replacement Program**

According to District records, they operate their wastewater system on an annual budget of approximately \$70,000. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are not accumulated through revenues. The District does not have a Capital Improvement Plan to date, and they currently have not built up reserves.

##### **Wastewater Flows**

Approximately 134 connections receive wastewater service within the Weott USA, of which all are residential connections (Dyett & Bhatia, 2002). This represents approximately 96% of those who receive water service, and 88% of homes within the District. Average dry weather flows

currently amount to approximately 14,000 gpd (Weott CSD, 2007), while peak wet weather flows are estimated at approximately 30,000 gpd. This represents a system wide peaking factor of approximately two.

### **Wastewater Collection, Treatment, and Disposal**

Weott CSD's collection system incorporates gravity mains and one lift station that direct wastewater to a community septic tank where preliminary treatment occurs. From here, raw wastewater flows through a recirculation tank and pea gravel filter, a chlorine contact basin, and dechlorination facilities. Disposal facilities consist of both a community leachfield and direct discharge to the South Fork Eel River, although the direct discharge disposal is not currently used. Sludge is dewatered and transported to the Humboldt County solid waste transfer station for landfill disposal. The original facilities were constructed in 1989 – 1991 and have a permitted capacity of 30,000 gpd.

Improvements to the WWTP were made in 2000 under a USDA grant and included improvements to the lift station, chlorination/dechlorination equipment, and the gravel filter distribution piping. The WWTP is currently operating at approximately 47% of design capacity.

### **Condition Assessment**

**Overview.** Wastewater service within the Weott USA is generally very good. It is uncertain at this point whether the District's disposal methods will face increased opposition in the future due to AB 885.

**Current Deficiencies.** There are no significant deficiencies with the District's wastewater collection, treatment, or disposal systems. Groundwater levels often reach within five feet of the bottom of the leachfield trenches, which could pose problems if AB 885 legislation is passed.

**Underserved Areas.** All areas within the District receive wastewater service with the exception of those on septic systems.

### **Proposed Improvements**

**System Upgrades.** The District has no plans for system upgrades other than typical maintenance of the system.

**Future Expansion.** The District has no plans for expansion other than servicing additional growth at existing rates of development.

**Cost and Schedule of Improvements.** The District does not have a CIP in place at this time. If AB 885 is passed and affects operation of the District's existing leachfield, this could likely cost the District upward of \$2 million to find an alternative summertime disposal method.

### **7.4.17. Willow Creek USA**

Willow Creek's commercial center and surrounding residential areas comprise the Willow Creek USA. Although the USA does not currently have a community wastewater system, the community has expressed interest in developing such a system. A high build-out estimate for total development potential of 76 new housing units in the USA was used for infrastructure assessment and recommendations. See Section 6.4.18 for a more detailed description of the USA and its development potential.

#### **7.4.17.1. Summary**

##### **Findings**

Willow Creek has been in the process of evaluating alternatives for a community wastewater system for a number of years now. Willow Creek's business center along Highway 299 is in need of a centralized wastewater system due to existing disposal field problems which currently limit development. The Jurin Project will need to address wastewater issues and is the site for the proposed wastewater treatment and disposal. A preliminary engineering report is being completed for the system. Current levels of service are still being determined and are therefore unknown at this time.

##### **Summary of Required Improvements**

No summary of improvements is included as the preliminary engineering report is still being completed. Based upon past experience we estimate that the total costs for a community wastewater collection, treatment and disposal system will cost between \$5 and \$15 million. We would expect that a portion of the project will receive grant funding so that the local share is affordable.

#### **7.4.17.2. Wastewater System**

##### **Service Area Description**

All existing development within the USA currently relies on on-site septic systems for wastewater treatment and disposal. However, the community and the Willow Creek CSD have recently expressed interest in developing a community-wide system to collect, treat, and dispose of wastewater. Under such a system, all potential development within the Willow Creek USA would receive wastewater service from the Willow Creek CSD. The construction of a community wastewater system would foster growth and development within the USA and would support the County's goals for redevelopment within the Willow Creek study area.

##### **System Standards**

The District's proposed wastewater system would be a public system, including publicly owned treatment works (POTW), and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

##### **Fiscal Condition/Capital Replacement Program**

The District should investigate grant funding for a community wastewater system. Potential grant funding sources are summarized in Section 12.2.5.

##### **Wastewater Flows**

The community system would likely serve approximately 220 connections within the Willow Creek USA, of which approximately 80% would be residential connections. Potential flows have not been estimated. I&I would be low for such a new collection system.

##### **Wastewater Collection, Treatment, and Disposal**

Plans for development of wastewater services in the central business district of Willow Creek are underway. The District is currently preparing feasibility studies to identify preferred methods of treatment. The District has identified a site for the treatment plant at 130 Flower-McNeil Road, formerly known as the Rochlin Mill. The preferred method of disposal is subsurface disposal.

## Proposed Improvements

**System Upgrades.** The District is proposing a community wastewater system for the Willow Creek USA. Construction is expected to begin in 2010.

**Future Expansion.** There are three phases to the proposed wastewater system. A community system would facilitate growth and development in the future.

**Cost and Schedule of Improvements.** It is estimated that the collection, treatment, and disposal facilities will cost approximately \$5 million.

## 7.5. Humboldt Community Services District USAs

See Section 6.6 for a general discussion of HCSD USAs and WSAs and Section 7.3 for a detailed discussion of issues affecting the HCSD and City of Eureka collection systems and the Elk River WWTP. Each of the USAs that receive HCSD wastewater collection services are analyzed below.

### 7.5.1. Humboldt Hill USA

A high build-out estimate for total development potential of 2,070 new housing units in the Humboldt Hill USA was used for infrastructure assessment and recommendations. See Section **Error! Reference source not found.**2 for a more detailed description of the Humboldt Hill USA and its development potential.

All proposed development within the Humboldt Hill USA would receive wastewater service from the HCSD. Humboldt Hill's collection system was originally part of the now dissolved CSA No. 3, and was taken over by HCSD in 1982. The District maintains a collection system and is under contract with the City of Eureka for treatment and disposal of wastewater. Development in the Humboldt Hill USA, when considered in aggregate with the other HCSD USAs, is mainly constrained by the City's treatment system.

Wastewater is collected from residences throughout the USA and flows by gravity to the South Broadway pump station, where it is then pumped through a 14-inch force main to the Elk River WWTP.

### Findings

Humboldt Hill's wastewater system is in generally good condition overall. Wastewater from the study area flows by gravity to the South Broadway Pump Station. High build-out development will require an upgrade to this station's pumping capacity. Efforts to reduce I&I within the collection system will continue. Development potential in the Humboldt Hill USA, when aggregated with development potential in the other HCSD USAs, is mainly limited by the City of Eureka's treatment capacity at its Elk River WWTP.

The Humboldt Hill USA could receive up to an additional 2,070 units before reaching build-out conditions. Humboldt CSD will need to expand its wastewater infrastructure, and coordinate closely with the City of Eureka regarding the Elk River WWTP, to serve this additional growth.

Development within the Humboldt Hill USA is not as constrained by capacity limitations in the City's collection system as are other areas served by HCSD. However, development is still constrained by the City's treatment and disposal capacity at their Elk River WWTP (see Section 7.3 for a full discussion of the Elk River WWTP), as the facility is nearing its permitted capacity

especially during wet weather conditions. The South Broadway pump station will also require increased pump capacity to serve additional growth.

### **7.5.2. Myrtle town USA**

A high build-out estimate for total development potential of 1,021 new housing units in the Myrtle town USA was used for infrastructure assessment and recommendations. See Section 6.6.2 for a more detailed description of the Myrtle town USA.

#### **Findings**

Myrtle town's wastewater system is generally in good condition overall, although some efforts are needed to reduce I&I. Development within the study area is dependent upon the City of Eureka's collection, treatment, and disposal systems.

All proposed development within the Myrtle town USA would receive wastewater service from HCSD. The District maintains a collection system and is under contract with the City of Eureka for treatment and disposal of wastewater. The District's collection system within the Myrtle town USA was installed in 1965. Myrtle town's collection system enters the City's collection system at the Hill St. Pump Station after being pumped from the HCSD Hoover St. Pump Station. Wastewater is then pumped from Hill St. Pump Station to the Elk River Treatment Plant.

Development within the Myrtle town USA is constrained by the capacity of both HCSD's and the City's collection system as well as the City's treatment and disposal capacity, in aggregate with other HCSD USAs. Myrtle town development is constrained by the City's pressure sewer capacity from the City's Hill Street pump station to the Elk River WWTP. The District and City are currently evaluating the limited pressure sewer capacity and options available to resolve these capacity limitations and provide sewer service for anticipated development build-out. Issues related to wet weather flows (I&I) continue to be addressed to reduce I&I and improve capacity as part of the City and HCSD's ongoing I&I reduction program.

### **7.5.3. South Eureka USA**

A high build-out estimate for total development potential of 8,048 new housing units in the South Eureka USA was used for infrastructure assessment and recommendations. There is potential for over 11,602 new housing units within the study areas provided sewer service by HCSD. See Section 6.6.3 for a more detailed description of the South Eureka USA and its development potential.

#### **Findings**

South Eureka's collection system services the Ridgewood, Cutten, and Pine Hill areas, which are served by a number of pump stations that pump to the City's collection system. South Eureka's wastewater system is in fair condition overall. Further development within the study area is dependent on both HCSD's and the City of Eureka's collection system and the City's treatment and disposal capacity. Development within the Pine Hill and Cutten sub-areas is mostly built-out. The majority of development potential lies within the Ridgewood sub-area, including large-scale developments described in the 1995 Eureka Community Plan as the Robinson Dunn, and Eggert North and Eggert South projects. These developments will largely depend on either the Martin Slough Interceptor project or other alternatives for collecting and transporting wastewater from these areas to the Elk River WWTP.

As discussed previously, HCSD has requested that its Sphere of Influence be expanded to include areas to the adjacent East of its boundary in an area known as Ryan Slough (areas E and F). See Section 7.3 for a discussion of proposed HCSD sewer service to these areas.

#### 7.5.4. Humboldt Community Services District Infrastructure Assessment

The following table summarizes the infrastructure assessment for all study areas served by Humboldt CSD, including the Humboldt Hill USA, Myrtle town USA, and South Eureka USA. Due to the interconnectedness of the wastewater system, the study areas could not be assessed individually and were instead assessed collectively. The following table addresses the District's infrastructure needs for existing development and for build-out conditions.

**Table 7-17. Wastewater system infrastructure assessment for the Humboldt CSD service area.**

<b>WASTEWATER SYSTEM STATISTICS</b>	
# of Existing Connections	6,285
# of Available Connections <sup>1</sup>	4,980
Permitted Dry Weather Treatment Capacity (MGD) <sup>2</sup>	----
Existing Dry Weather Flows (MGD)	0.97
Existing Peak Wet Weather Flows (MGD)	Estimated at 6 – 9
I&I Peaking Factor	3.3 – 10
<b>LOW &amp; HIGH BUILD-OUT ESTIMATES</b>	
# of Projected New Connections	4,314 – 11,602
# of Total Future Connections	10,599 – 17,887
Proposed Infrastructure Upgrades	Estimated Cost (\$)
<i>Pumping System Upgrades</i>	\$ Unknown
<i>Collection System I&amp;I Upgrades</i>	\$4,000,000
<i>Martin Slough Interceptor Share</i>	\$ Unknown
<i>Additional treatment capacity at Elk River WWTF</i>	\$ Unknown
<b>Estimated Cost for Build-Out Infrastructure (\$)</b>	<b>\$ Unknown</b>
<b>Est. Cost per Existing Connection (\$)</b>	<b>\$ Unknown</b>
<b>Est. Financing Cost per Existing Connection (\$/Month)</b>	<b>\$ Unknown</b>
<b>Est. Range of Costs per Total Future Connection (\$)</b>	<b>\$ Unknown</b>
<b>Est. Financing Cost per Total Future Connection (\$/Month)</b>	<b>\$ Unknown</b>

NOTES: <sup>1</sup> The number of available connections was estimated based on the District being at 60% of its contracted allotment for average dry weather flows.

<sup>2</sup> The District contracts with the City of Eureka for treatment at its Elk River WWTP.

Due to uncertainties involving the Elk River treatment plant and the Martin Slough Interceptor, costs for future improvements were not estimated. However, funding for this infrastructure would likely come in the form of a low interest loan, like a State Revolving Fund loan with a loan term of 20 years at 2.5% interest. It is expected that the City and District would apply for and hopefully obtain some grant funding that would reduce the local cost. In addition, actual improvements are expected to be sized to correct both existing deficiencies and have additional capacity to serve future development. To the extent that this can be done it will provide savings through economies of scale.

Future connections will also need to buy into the existing infrastructure through connection fees in order to build sufficient reserves for infrastructure replacement in the future. These should be determined by detailed rate studies and financial analyses. The unit costs shown under the low and high build-out estimates represent a minimum value for a connection fee, as these numbers do not reflect new connections' cost for sharing of the existing infrastructure. City and District

specific studies (master plans) or project specific studies (facility plans) should be used to appropriately distribute the costs between existing and new users.

## **Wastewater System**

### **System Standards**

The District's wastewater system is a public system and as such must be operated to meet the requirements of the Federal Clean Water Act and California Water Code. See Section 7.2 for additional information regarding system standards.

### **Fiscal Condition/Capital Replacement Program**

According to District records, they operate their wastewater system on an annual budget of approximately \$2.6 million. The majority of this income is from service charges, but funding also comes from property taxes, interest revenue, connection fees, and other smaller sources. Replacement or depreciation funds are accumulated through revenues for vehicles and other specialty equipment but not for water infrastructure. The District's latest Capital Improvement Plan was developed in 2007, and they currently have \$2.84 million in water and wastewater reserves.

### **Wastewater Flows**

Wastewater is collected from approximately 6,285 connections throughout HCSD's service areas. Average dry weather flows for the District were approximately 0.97 MGD in 2006. Flow data is collected on a daily basis. The maximum month flow for 2006 occurred in January and totaled approximately 97 MG, which yields an average day maximum month flow of slightly over 3 MGD. Peak wet weather flows are likely two to three times this amount. The peaking factor for the system is estimated to be around six.

### **Wastewater Collection, Treatment, and Disposal**

HCSD is contracted with the City of Eureka for treatment and disposal, whose Elk River WWTP is operated under waste discharge requirements set forth in Order No. R1-2004-0013 and NPDES Permit No. CA0024449.

### **Condition Assessment**

**Overview.** HCSD's contract with the City of Eureka allows for average August flows of up to 30.5% of the permitted capacity of the Elk River WWTP, which is 5.24 MGD. Therefore, based on data provided by HCSD, its share is approximately 1.6 MGD, so the District's existing flows are approximately 60% of its contracted allotment.

**Current Deficiencies.** No significant deficiencies exist with the District's existing collection system. Although I&I has historically been a problem, the District has been making progress in addressing problem areas in its collection system. The District is only limited by treatment and disposal capacity at the Elk River WWTP.

**Underserved Areas.** All district areas can receive wastewater service from the District; however, significant additional development will require the completion of the Martin Slough Interceptor Project. Areas outside the district could receive wastewater service upon annexation.

### **Proposed Improvements**

**System Upgrades.** The District has no major plans for system collection system upgrades, aside from regular maintenance efforts. The District has been very proactive in implementing an

intensive maintenance program throughout its system. The District and City of Eureka are currently evaluating the existing capacity of and anticipating expansion of the City's Elk River Wastewater Treatment Plant, and evaluating pressure sewer capacity limitations from the City's Hill Street pump station to the Elk River WWTP.

**Future Expansion.** The District is interested in extending its SOI and boundaries in order to provide service to any new development within the current or proposed expanded SOI and district boundary.

**Cost and Schedule of Improvements.** The District has an intensive CIP program that is updated annually and projects out five years. The latest was developed in 2006 and has planned the following improvements to its system:

- 1) Convert obsolete, antiquated dry well lift stations to submersible pump operation (ongoing).
- 2) Replace electrical control panels (completed).
- 3) Add emergency transfer switches to all control panels (completed).
- 4) Implement a video inspection program to determine the condition of the underground sewer pipeline system (ongoing).
- 5) Implement an I&I program to identify and reduce surface and groundwater from entering the sewer system (ongoing).
- 6) Finalize a Sewer Capital Improvement Program based on the above findings analysis (ongoing).

## 7.6. On-Site Systems

Many communities within the County rely strictly on on-site septic systems for wastewater treatment. Examples include the communities of Carlotta and Hydesville. Both communities are part of the County identified Hydesville USA, which indicates the County would like to see a community sewer system in place. However, neither community is interested in a community system or the development that would be facilitated by such a system. In addition, all development that occurs outside of USA's utilizes on site wastewater systems for treatment and disposal.

If AB 885 (as currently drafted) gets approved at the State level, this could potentially have a significant negative effect for these and other on-site systems spread throughout the County. This bill would require a minimum depth of five feet between the bottom of leaching trenches and the anticipated highest level of groundwater. Many areas within the County would not meet these new criteria making future development difficult if not impossible. While existing systems are typically exempt from these new regulations, it will affect future development. In addition the law allows the use of bottom area only when computing leachfield loading and does not allow one to also use the sidewall area. This will require significantly larger areas for disposal.

There are a number of areas that are a "waiver prohibition" area. These areas, which include Jacoby Creek, Fieldbrook, Indianola and Elk River, are locations where high groundwater normally occurs during the winter. This condition is a result of poorly draining soils so that a perched water table develops that will severely limit the potential for new development to occur in these areas.

Another area of concern is in Fairhaven and other locations on the Humboldt Bay peninsula that utilize on site systems. In these locations the soils are beach sand and the current regulations require a 40 foot separation to groundwater due to the lack of fines. New development in this area will not occur unless the regulations are changed to reduce the separation requirement. This should be feasible as there is significant data available that shows that 2 feet of sand, similar to what is used in the design of Wisconsin mound systems provide adequate separation for effective treatment.

The other critical issue facing the use of on-site wastewater systems is the effluent nitrate concentration. Standard septic tank and leachfield systems are not designed to achieve nitrate removal to the levels set for drinking water (10 mg/l). While there are advanced treatment systems that can reduce nitrate levels, these add significantly to the capital and operational costs for these systems. That said, these systems are very suitable for locations where there is high ground water or poor soils so that the soils are only used for disposal and not for treatment. Essentially, by providing all of the necessary treatment in a specially designed facility, like a recirculating filter, the effluent can be treated to a tertiary level such that it does not impact groundwater.

## 7.7. Policy Recommendations

This technical report presents a basis for describing and assessing wastewater services being provided in Humboldt County. As documented in this report and as was similar with the water infrastructure, in many cases, service providers need to make considerable improvements to their wastewater infrastructure to provide acceptable levels of service. The service providers will need significant resources and revenue to appropriately respond to this need, and the County may need to provide a supporting role to ensure these service providers succeed in accomplishing this.

This technical report will be used to guide development of the Community Infrastructure and Services Element and the recommended policies therein.

### **ISSUES TO BE ADDRESSED IN THE COMMUNITY INFRASTRUCTURE AND SERVICES ELEMENT**

The Community Infrastructure and Services Element will include goals, policies and programs for the following issues;

**Ability to Function.** Many of the service providers within the County lack the technical, managerial, and financial capacity to continue providing acceptable levels of service given aging infrastructure, population growth, and an increasingly complex regulatory environment. The policy document will recommend policies and programs the County can implement to assist and enable these service providers.

**Rates.** Most service providers within the County have historically charged low rates that generally do not adequately cover the costs of providing water service. This practice has led to degraded systems, deteriorating levels of service, and a lack of reserves to address and improve the situation. The Element will recommend policies and programs the County can implement to get the service providers to conduct rate studies and reduce costs of providing services to reduce "rate shock" within the County.

**Funding of Infrastructure.** The most significant obstacle when planning capital improvements for both rehabilitation and construction of new infrastructure is funding. Many of the providers serve

small communities with limited resources. Assistance from the County would likely help the agencies secure the needed funding. The Element will recommend policies and programs the County can implement to secure funding and assist service providers in developing competitive grant and loan applications.