

FY 2023-24

ENGINEER'S REPORT

Glenn County

Valley-wide Mosquito and Disease Control
Assessment

July 2023
Final Report

Engineer of Work:



4745 Mangels Boulevard
Fairfield, California 94534
707.430.4300
www.sci-cg.com

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Glenn County Valley-wide Mosquito Abatement District

Mosquito and Disease Control Assessment
Final Engineer's Report, FY 2023-24



Glenn County Valley-wide Mosquito Abatement District

Glenn County Board of Supervisors

| | |
|----------------|------------|
| Grant Carmon | District 1 |
| Monica Rossman | District 2 |
| Tom Arnold | District 3 |
| Jim Yoder | District 4 |
| Vacant | District 5 |

Glenn County Health and Human Services Agency Director

Christine Zoppi

Glenn County Counsel

William J. Vanasek

Engineer of Work

SCI Consulting Group

Glenn County Valley-wide Mosquito Abatement District

Mosquito and Disease Control Assessment
Final Engineer's Report, FY 2023-24



Table of Contents

| | |
|--|-----------|
| <i>Glenn County Board of Supervisors</i> | ii |
| <i>Glenn County Health and Human Services Agency Director</i> | ii |
| <i>Glenn County Counsel</i> | ii |
| <i>Engineer of Work</i> | ii |
| Introduction | 1 |
| Overview | 1 |
| Mosquito Control Services | 2 |
| Legislative Analysis | 4 |
| <i>Proposition 218</i> | 4 |
| <i>Silicon Valley Taxpayers Association, Inc. v. Santa Clara County Open Space Authority</i> | 5 |
| <i>Dahms v. Downtown Pomona Property</i> | 6 |
| <i>Bonander v. Town of Tiburon</i> | 6 |
| <i>Beutz v. County of Riverside</i> | 6 |
| <i>Compliance with Current Law</i> | 6 |
| General Description of the Services | 8 |
| About the Mosquito Abatement District | 8 |
| Summary of Services | 8 |
| Mosquitoes and Mosquito-borne Diseases in the Service Area..... | 10 |
| Mosquitoes..... | 10 |
| Integrated Pest Management | 13 |
| <i>Permanent water mosquitoes</i> | 14 |
| <i>Floodwater Mosquitoes</i> | 17 |
| Public Relations, Outreach, and Education | 17 |
| Research and Testing | 17 |
| Assessment | 18 |
| Cost Estimate | 21 |
| Method of Assessment..... | 23 |
| Discussion of Benefit | 23 |
| Mosquito Control Is a Special Benefit to Properties | 25 |
| Benefit Factors | 25 |
| Benefit Finding | 32 |
| General vs. Special Benefit | 32 |

Glenn County Valley-wide Mosquito Abatement District

Calculating General Benefit..... 34

Benefit to Property Outside the District 35

Benefit to Property Inside the District that is Indirect and Derivative 37

Benefit To The Public At Large 38

Summary of General Benefits 38

Method of Assessment..... 39

Zones of Benefit 42

Additional Information regarding Mosquito Control in Hamilton City 42

History of Recent Assessments in Hamilton City 42

Assessment Apportionment..... 43

Residential Properties 44

Commercial/Industrial Properties..... 45

Agricultural, Rangeland, and Cemetery Properties..... 46

Vacant Properties 47

Other Properties..... 48

Appeals and Interpretation 49

Duration of Assessment 49

Assessment Diagram 50

Assessment Roll 52

Glenn County Valley-wide Mosquito Abatement District

List of Figures

| | |
|---|----|
| Figure 1 – Summary Expenditures Estimate – FY 2023-24 Budget..... | 18 |
| Figure 2 – Cost Estimate – FY 2023-24 Budget | 21 |
| Figure 3 – Residential Assessment Factors | 45 |
| Figure 4 – Commercial/Industrial Benefit Assessment Factors | 47 |

Introduction

Overview

Most populated areas in California fund year-round mosquito and disease control services through local funding sources. Prior to 2007, no reliably funded mosquito control services had been provided in Glenn County outside of the two, relatively small, established mosquito control districts. Utilizing special emergency grants, which were authorized by the State Legislature and Governor for use in combating West Nile Virus, and other mosquito-borne diseases, the Glenn County Health and Human Services Agency (“HHS,” formerly known as the Glenn County Health Services Agency) provided limited mosquito services in 2005 and 2006. However, it became clear that State emergency funding for such services had been exhausted and it was highly unlikely that the State would continue to provide sufficient funding for future mosquito and disease control services in the County. Accordingly, in late 2006, the Glenn County Health and Human Services Agency decided to investigate the possibility of establishing a local funding source for focused mosquito and disease control services. The Agency conducted a survey which confirmed that property owners in the Valley area of the county would support local funding for these services.

In 2007, the Board of Supervisors directed the initiation of proceedings for a proposed special assessment for mosquito and disease control services in a “Service Area” including the City of Orland, Hamilton City, and most of unincorporated Glenn County east of the Tehama Colusa Canal and east of County Road “D”, and not including the areas currently served by the Glenn County Mosquito and Vector Control District (which, despite its’ name, serves only the City of Willows) nor the area served by Rice Pest Abatement District #1.

In the summer of 2007, the County conducted an assessment ballot proceeding pursuant to the requirements of Article XIID of the California Constitution (“The Taxpayer’s Right to Vote on Taxes Act”) and the Health and Safety Code. During this ballot proceeding, property owners in the proposed Service Area were provided with a notice and ballot for the proposed special assessment. A 45-day period was provided for balloting and a public hearing was conducted on July 17, 2007. After the public hearing, all ballots returned within the 45-day balloting period were tabulated.

Glenn County Valley-wide Mosquito Abatement District

It was determined by the tabulation that 60.81% of the weighted ballots returned were in support of the assessment. (A total of 2,128 valid ballots were returned - a 36% return rate.) Since the assessment ballots submitted in opposition to the proposed assessments did not exceed the assessment ballots submitted in favor of the assessments (with each ballot weighted by the proportional financial obligation of the property for which ballot was submitted), the County gained the authority to approve the levy of the assessments for fiscal year 2007-08 and to continue to levy them in future years. On August 31, 2007, the Glenn County Board of Supervisors approved the assessment per Resolution 2007-51. This funding helped establish a mosquito and disease control "Program" beginning in late 2007. The authority granted by the ballot proceeding includes an annual adjustment in the maximum authorized assessment rate equal to the annual change in the Consumer Price Index for the San Francisco Area, not to exceed 3%.

In each subsequent year for which the assessments will be levied, the County must direct the preparation of an Engineer's Report, budgets and proposed assessments for the upcoming fiscal year. A public hearing will be held on July 18, 2023. If the County approves this Engineer's Report and the proposed assessments following the public hearing, the assessments will be submitted to the County Auditor/Controller for inclusion on the property tax rolls for Fiscal Year 2023-24.

Mosquito Control Services

The Program's main services are summarized as follows:

- Early detection of public health threats through mosquito and disease surveillance.
- Elimination and control of mosquitoes to diminish the nuisance and harm caused by mosquitoes.
- Protection of public health by reducing mosquitoes or exposure to mosquitoes that transmit diseases.
- Response to requests to prevent/control mosquitoes, and the diseases they can transmit.

Prior to this assessment, the Program did not exist and there was effectively no comprehensive mosquito control in current Service Area. Hence, the “baseline” level of mosquito control services in the Service Area was zero. The Service Area was narrowly drawn to include only properties that may request and/or receive direct and more frequent service, that are located within the scope of the vector surveillance area, that are located within flying or traveling distance of potential vector sources monitored by the Program, and that benefit from a reduction in the amount of mosquitoes reaching and impacting the property as a result of the enhanced mosquito surveillance and control. The Assessment Diagram included in this report shows the boundaries of the Service Area.

As used within this Report and the benefit assessment ballot proceeding, the following terms are defined:

“Vector” means any animal capable of transmitting the causative agent of human disease or capable of producing human discomfort or injury, including, but not limited to, mosquitoes, flies, mites, ticks, other arthropods, and small mammals and other vertebrates (Health and Safety Code Section 2002(k)).

“Vector Control” shall mean any system of public improvements or services that is intended to provide for the surveillance, prevention, abatement, and control of vectors as defined in subdivision (k) of Section 2002 of the Health and Safety Code and a pest as defined in Section 5006 of the Food and Agricultural Code (Government Code Section 53750(m)).

The Program is controlled by Mosquito Abatement and Vector Control District Law of the State of California. Following are excerpts from the Mosquito Abatement and Vector Control District Law of 2002, codified in the Health and Safety Code, Section 2000, et seq. which serve to summarize the State Legislature’s findings and intent with regard to mosquito abatement and other vector control services:

2001. (a) The Legislature finds and declares all of the following:

(1) California's climate and topography support a wide diversity of biological organisms.

(2) Most of these organisms are beneficial, but some are vectors of human disease pathogens or directly cause other human diseases such as hypersensitivity, envenomization, and secondary infections.

(3) Some of these diseases, such as mosquito borne viral encephalitis, can be fatal, especially in children and older individuals.

(4) California's connections to the wider national and international economies increase the transport of vectors and pathogens.

(5) Invasions of the United States by vectors such as the Asian tiger mosquito and by pathogens such as the West Nile virus underscore the vulnerability of humans to uncontrolled vectors and pathogens.

(b) The Legislature further finds and declares:

Glenn County Valley-wide Mosquito Abatement District

(1) Individual protection against the vector borne diseases is only partially effective.

(2) Adequate protection of human health against vector borne diseases is best achieved by organized public programs.

(3) The protection of Californians and their communities against the discomforts and economic effects of vector borne diseases is an essential public service that is vital to public health, safety, and welfare.

(4) Since 1915, mosquito abatement and vector control districts have protected Californians and their communities against the threats of vector borne diseases.

(c) In enacting this chapter, it is the intent of the Legislature to create and continue a broad statutory authority for a class of special districts with the power to conduct effective programs for the surveillance, prevention, abatement, and control of mosquitoes and other vectors.

(d) It is also the intent of the Legislature that mosquito abatement and vector control districts cooperate with other public agencies to protect the public health, safety, and welfare. Further, the Legislature encourages local communities and local officials to adapt the powers and procedures provided by this chapter to meet the diversity of their own local circumstances and responsibilities.

Further the Health and Safety Code, Section 2082 specifically authorizes the creation of benefit assessments for vector control, as follows:

(a) A district may levy special benefit assessments consistent with the requirements of Article XIID of the California Constitution to finance vector control projects and programs.

This Engineer's Report ("Report") was prepared by SCI Consulting Group (SCI) to establish the estimated costs for the mosquito, disease surveillance and control services and related costs that would be funded by the assessments, to determine the special benefits and general benefits received from the services and to apportion the proposed assessments to lots and parcels within the Program's Service Area based on the estimated special benefit each parcel receives from the services funded by the benefit assessment.

Legislative Analysis

Proposition 218

This assessment was formed consistent with Proposition 218, The Right to Vote on Taxes Act, which was approved by the voters of California on November 6, 1996, and is now Article XIIC and XIID of the California Constitution. Proposition 218 provides for benefit assessments to be levied to fund the cost of providing services, improvements, as well as maintenance and operation expenses to a public improvement which benefits the assessed property.

Glenn County Valley-wide Mosquito Abatement District

Proposition 218 describes a number of important requirements, including a property-owner balloting, for the formation and continuation of assessments, and these requirements are satisfied by the process used to establish this assessment. When Proposition 218 was initially approved in 1996, it allowed for certain types of assessments to be “grandfathered” in, and these were exempted from the property-owner balloting requirement.

Beginning July 1, 1997, all existing, new, or increased assessments shall comply with this article. Notwithstanding the foregoing, the following assessments existing on the effective date of this article shall be exempt from the procedures and approval process set forth in Section 4:

(a) Any assessment imposed exclusively to finance the capital costs or maintenance and operation expenses for sidewalks, streets, sewers, water, flood control, drainage systems or vector control.

Vector control was specifically “grandfathered in,” underscoring the fact that the drafters of Proposition 218 and the voters who approved it were satisfied that funding for vector control is an appropriate use of benefit assessments, and therefore confers special benefit to property.

Silicon Valley Taxpayers Association, Inc. v. Santa Clara County Open Space Authority

In July of 2008, the California Supreme Court issued its ruling on the Silicon Valley Taxpayers Association, Inc. v. Santa Clara County Open Space Authority (“SVTA vs. SCCOSA”). This ruling is the most significant legal document in further legally clarifying Proposition 218. Several of the most important elements of the ruling included further emphasis that:

- Benefit assessments are for special benefit to property, not general benefits¹
- The services and /or improvements funded by assessments must be clearly defined
- Special benefits are directly received by and provide a direct advantage to property in the assessment district

This Engineer’s Report, and the process used to establish this assessment are consistent with the SVTA vs. SCCOSA decision.

¹ Article XIII D, § 2, subdivision (d) of the California Constitution states defines “district” as “an area determined by an agency to contain all parcels which will receive a special benefit from the proposed public improvement or property-related service.”

Glenn County Valley-wide Mosquito Abatement District

Dahms v. Downtown Pomona Property

On June 8, 2009, the 4th Court of Appeal amended its original opinion upholding a benefit assessment for property in the downtown area of the City of Pomona. On July 22, 2009, the California Supreme Court denied review. On this date, Dahms became good law and binding precedent for assessments. In Dahms the Court upheld an assessment that was 100% special benefit (i.e. 0% general benefit) on the rationale that the services and improvements funded by the assessments were directly provided to property in the assessment district. The Court also upheld discounts and exemptions from the assessment for certain properties.

Bonander v. Town of Tiburon

On December 31, 2009, the 1st District Court of Appeal overturned a benefit assessment approved by property owners to pay for placing overhead utility lines underground in an area of the Town of Tiburon. The Court invalidated the assessments on the grounds that the assessments had been apportioned to assessed property based on in part on relative costs within sub-areas of the assessment district instead of proportional special benefits.

Beutz v. County of Riverside

On May 26, 2010 the 4th District Court of Appeals issued a decision on the Steven Beutz v. County of Riverside (“Beutz”) appeal. This decision overturned an assessment for park maintenance in Wildomar, California, primarily because the general benefits associated with improvements and services was not explicitly calculated, quantified and separated from the special benefits.

Compliance with Current Law

This Engineer’s Report is consistent with the requirements of Article XIIC and XIID of the California Constitution and with the *SVTA* decision because the Services to be funded are clearly defined; the Services are available to and will be directly provided to all benefiting property in the Assessment District; and the Services provide a direct advantage to property in the Assessment District that would not be received in absence of the Assessments.

This Engineer’s Report is consistent with *Dahms* because, similar to the Downtown Pomona assessment validated in *Dahms*, the Services will be directly provided to property in the Assessment District. Moreover, while *Dahms* could be used as the basis for a finding of 0% general benefits, this Engineer’s Report establishes a more conservative measure of general benefits.

Glenn County Valley-wide Mosquito Abatement District

The Engineer's Report is consistent with *Bonander* because the Assessments have been apportioned based on the overall cost of the Services and proportional special benefit to each property. Finally, the Assessments are consistent with *Buetz* because the general benefits have been explicitly calculated and quantified and excluded from the Assessments.

General Description of the Services

About the Mosquito Abatement District

The Glenn County Valley-wide Mosquito Abatement District Program (the “Program”) provides protection to property by controlling and monitoring disease-carrying insects such as mosquitoes. The Program protects the usefulness, desirability and livability of property and the inhabitants of property within its Service Area. In addition, the Program frequently tests for diseases carried by mosquitoes and helps prevent mosquito-borne disease outbreaks through mosquito control, regular surveillance and regularly educating the public about disease risks and how to protect themselves from diseases transmitted by mosquitoes.

Summary of Services

As mentioned earlier, the Program previously did not exist and provided a zero “baseline” level of services in the Service Area. This Assessment provides the funding to operate the Program and provide the services in the Service Area necessary to protect the usefulness, utility, desirability and livability of property within its jurisdictional area.

Following are the proposed Services, and resulting level of service for the Assessment Area. The formula below describes the relationship between the final level of service, the existing baseline level of service, and the enhanced level of service to be funded by the assessment.

$$\text{Final Level of Service} = \text{Baseline Level of Service (zero level – 2007 and prior)} + \text{Enhanced Level of Service}$$

The assessment provides funding for the surveillance, disease prevention, abatement, and control of mosquitoes within the most populated sections of Glenn County which are currently without mosquito control services. These areas are generally described as the areas including the City of Orland, Hamilton City, and most of unincorporated Glenn County east of the Tehama Colusa Canal and east of County Road “D”, and not including the areas currently served by the Glenn County Mosquito and Vector Control District (which, despite its name, serves only the City of Willows) nor the area served by Rice Pest Abatement District #1 (the “Service Area”). Mosquito abatement and disease prevention projects and programs include, but are not limited to, source reduction, biological control, larvicide applications, adulticide applications, disease monitoring, public education, reporting, accountability, research and interagency cooperative activities, as well as capital costs, maintenance, and operation expenses (collectively “Services”). The cost of these Services also includes capital costs comprised of equipment, capital improvements and facilities and other incidental expenses necessary and incidental to the mosquito control program.

Glenn County Valley-wide Mosquito Abatement District

Mosquitoes and Mosquito-borne Diseases in the Service Area

Mosquitoes

Mosquitoes generally occur where there is adequate vegetation for harborage and where water is standing and/or stagnant. Although these mosquitoes have seasonal cycles, they tend to reproduce continuously while conditions are suitable.

The following species are currently important in the Service Area:

| SPECIES | HABITAT | ABUNDANCE | SEASON | DISEASE ASSOCIATIONS |
|-------------------------------|---------------------------------|-----------|----------------------|--|
| <i>Culex tarsalis</i> | Many | Great | Spring, Summer, Fall | West Nile virus, St. Louis encephalitis, Western equine encephalitis |
| <i>Culex pipiens</i> | Many | Great | Spring, Summer, Fall | West Nile virus, St. Louis encephalitis |
| <i>Culiseta incidens</i> | Many | Moderate | Winter, Spring, Fall | None, serious pest in urban/suburban areas |
| <i>Culiseta inornata</i> | Many | Moderate | Winter, Spring, Fall | None, serious pest in urban/suburban areas |
| <i>Anopheles freeborni</i> | Creeks, lakes, wetlands | Great | Year Round | Malaria |
| <i>Anopheles punctipennis</i> | Creeks, lakes | Moderate | Summer, Fall | Malaria |
| <i>Aedes sierrensis</i> | Oak tree holes, walnut orchards | Moderate | Late winter, Spring | Canine heartworm, serious pest in urban/suburban areas |
| <i>Aedes melanimon</i> | Pastures, wetlands | Moderate | Spring, Summer, Fall | Western equine encephalitis, serious pest |
| <i>Aedes nigromaculis</i> | Pastures, irrigated crops | Moderate | Spring, Summer, Fall | None, serious pest species in agricultural areas |
| <i>Aedes washinoi</i> | Fresh floodwater sites | Moderate | Winter, Spring | none |
| <i>Aedes vexans</i> | Fresh floodwater sites | Moderate | Summer | None, serious pest in recreational areas |

Glenn County Valley-wide Mosquito Abatement District

Culex erythrothorax could become an important mosquito in Glenn County. This mosquito variety is associated with large emergent vegetation in fresh water (e.g., tules), and is abundant throughout Glenn County. *Culex erythrothorax* is a strong vector of West Nile virus and an avid human biter.

New species of the *Aedes* mosquitos, "*Aedes aegypti*" and "*Aedes albopictus*", are both associated with the Zika virus and the Chikungunya virus and are potentially invasive vectors. In order to control these species, ongoing communication between local vector control agencies, local health departments and the California Department of Public Health will be extremely important. If the Zika virus is contracted, the Program will conduct extensive and enhanced surveillance and control of the *Aedes* mosquito.

Mosquitoes that lay their eggs in damp soil that might be flooded up to two years later occupy floodwater habitats. Once the area floods, most of the eggs hatch, producing a large number of mosquitoes for a short period of time. The Service Area has two floodwater species of concern. Floodwater mosquitoes prefer to bite in the evening, but they also bite during the day. One species, *Aedes washinoi* has only one generation annually, spending most of the year as eggs. *Aedes vexans* has multiple generations, but its numbers are restricted by the lack of rainfall during the warm part of the season when it occurs.

Aedes and *Ochlerotatus spp.* are major pests in the Central Valley of California and can potentially take advantage of changing conditions in Glenn County. *Ochlerotatus nigromaculis* is abundant in parts of the County associated with irrigated pastures. It can have many generations per year, can travel long distances, and is an aggressive hard-biting pest species.

Outdoor containers that hold standing water are another common mosquito habitat in Orland and Hamilton City. Containers can range from naturally occurring holes in trees, to discarded tires, swimming pools, ornamental ponds, bird baths, discarded cans, cemetery flower cups, crumpled plastic and plugged rain gutters. Both *Culex pipiens* and *Culiseta incidens* commonly occur in containers other than tree holes. The tree hole-breeders are characterized by day-biting activity, bright markings, and deposition of eggs above the water line in the container. Glenn County has a native tree-hole mosquito, *Aedes sierrensis*, which normally hatches only one generation per year. It can reach great abundance locally but it does not fly far. *Aedes sierrensis* is commonly considered the area's most important vector of dog heartworm. *Aedes albopictus* and *Aedes aegypti* are two potentially important container breeders that could get introduced into the Service Area. Historically these types of mosquitoes have been introduced to many other areas of the U.S. through transportation associated with international commerce. *Aedes albopictus* is an important species because it reaches great abundance, bites during the day, and reproduces continuously in containers often associated with human habitations. *Aedes aegypti* has similar habits, but has the additional drawback of being a powerful virus vector, specifically, dengue and yellow fever.

Mosquito-transmitted diseases in the Service Area are caused by either viruses or the protozoan parasite of malaria (*Plasmodium falciparum* or *Plasmodium vivax*). This region has historically had sporadic detections of common California viruses like Western equine encephalitis and St. Louis encephalitis. Starting in 2004, West Nile virus was found in wild birds, sentinel chicken flocks, mosquito pools and horses. Malaria does not circulate in California at this time, but it used to be a major health problem in the Central Valley. Trappers, miners and other immigrants introduced malaria into California in the 1800s from areas where malaria was common. Effective mosquito control and drugs to cure malaria in humans led to the eradication of malaria in California in the 1950s. Consistent reintroduction in humans from overseas creates a constant threat from malaria. In addition, some strains of malaria found in the world today are resistant to drugs that helped to eradicate the disease in the 1950s. The mosquitoes that can spread malaria are still abundant in the region and are capable of redistributing this serious health threat if the virus should somehow be reintroduced to the area.

The diseases of most concern are: Western equine encephalitis (WEE), St. Louis encephalitis (SLE), West Nile virus (WNV), Malaria, Zika virus, and Chikungunya virus, which are all transmitted by mosquitoes. Among the principal threats to which the Glenn County Health and Human Services Agency intends to respond to are:

- Human and animal diseases associated with mosquitoes
- Annoyance and economic disruption caused by mosquitoes

Glenn County Valley-wide Mosquito Abatement District

Integrated Pest Management

The Program's services address several types of vectors and share general principles and policies. These include the identification of vector problems; responsive actions to control existing populations of vectors, prevention of new sources of vectors from developing, and the management of habitat minimize vector production; education of land-owners and others on measures to minimize vector production or interaction with vectors; and provision and administration of funding and institutional support necessary to accomplish these goals.

In order to accomplish effective and environmentally sound vector management, the manipulation and control of vectors must be based on careful surveillance of their abundance, habitat (potential abundance), pathogen load, and/or potential contact with people; the establishment of treatment criteria (thresholds); and appropriate selection from a wide range of control methods. This dynamic combination of surveillance, treatment criteria, and use of multiple control activities in a coordinated program is generally known as Integrated Pest Management (IPM) (Glass 1975, Davis et al 1979, Borror et al 1981, Durso 1996, Robinson 1996).

The Glenn County Valley-wide Mosquito Abatement District's Vector Management Program, like any other IPM program, by definition involves procedures for minimizing potential environmental impacts. The Program employs IPM principles by first determining the species and abundance of vectors through evaluation of public service requests and field surveys and trapping of immature and adult pest populations; and then, if the populations exceed predetermined criteria, using the most efficient, effective, and environmentally sensitive means of control. For all vector species, public education is an important control strategy. In appropriate situations, water management or other physical control activities (historically known as "source reduction" or "physical control") can be instituted to reduce vector-breeding sites. **The Program also uses biological control such as the planting of mosquitofish (in ornamental ponds, unused swimming pools and other standing water bodies).** When these approaches are not effective or are otherwise inappropriate, natural materials that have been found to be environmentally safe are used to treat specific pest-producing or pest-harboring areas.

The Glenn County Valley-wide Assessment District is organized into two principle sections to accomplish IPM. First, the administrative element provides leadership, expertise, public relations/education, and interface with other governmental authorities. Second, the operational section includes a technician that performs IPM in the field. The technician performs control and surveillance functions by responding to complaints from individual residents and by examination of aquatic sites for mosquito larvae. The technician also monitors the treated areas to be sure that their control efforts have been successful.

The Program maintains the capability of applying aerosolized insecticide for area treatment of adult mosquitoes. The method used to abate severe pest problems caused by active adult mosquitoes within the Service Area, to quickly reduce significant populations of adult mosquitoes and to prevent or to reduce the spread of mosquito-borne disease in the environment. The Program uses only products that have been deemed safe, approved and labeled by the U.S. Environmental Protection Agency for this purpose. Applications are made by personnel licensed by the California Department of Public Health and trained in the proper use of the products and specialized equipment used for this type of public health pest control. In addition, the administrative staff holds a Qualified Applicator Certificate issued by the California Department of Pesticide Regulation.

Permanent water mosquitoes

Risk assessment: Historically, *Culex tarsalis* and *Culex pipiens* have been very abundant in Glenn County. The great disease transmission potential of these species documented in this and other parts of the State suggests that they are the principal vector mosquito species within the Service Area. *Anopheles spp.* mosquitoes have persisted as a problem in standing water isolations in fields, wetlands and along a number of major drainages that provide persistent areas of standing water in the Service Area. The threat of *Anopheles* as vectors is reduced by the absence of resident malaria pathogens in the area, but they remain an important pest species in this area. *Culiseta*, particularly *Culiseta incidens* and *Culiseta inornata*, are very widespread in the area, occurring in many kinds of habitats during most of the year. However, tests of their ability to transmit viral pathogens show them to be of little significance as vectors.

Surveillance: Surveillance of these mosquitoes is accomplished by a combination of methods. First, a technician actively examines potential sites by sampling water, collecting larvae, and identifying the larvae to species. Second, various traps (carbon dioxide baited traps, foul water traps to attract ovipositing females) are used to collect adult mosquitoes. The traps are set weekly during the season and the collected mosquitoes are subsequently classified and identified to species. Finally, individual residents and property owners call the Program directly with complaints about mosquito bites or to report standing water and potential larval sites.

The Program's one full-time-equivalent mosquito control technician routinely inspects and treat residential, agricultural, industrial and natural standing water sources known to produce mosquitoes within the Service Area. These sources need to be monitored on a regular schedule for the presence of standing water and mosquito larvae. One type of standing water of particular concern to the Program is runoff held in catch basins throughout the Program, particularly in the urbanized areas. Catch basins can produce *Culex pipiens* in great numbers at locations close to residences and businesses. In rural areas of the Service Area, standing water in fields, wetlands, and other man-made sources produce *Culex tarsalis* in great numbers. This species is capable of flying long distances and is considered the primary vector of West Nile virus.

Viruses transmitted by permanent water mosquitoes are surveyed by testing the mosquito vectors, the avian reservoirs, horses and humans. West Nile virus can be detected by submitting samples to neighboring mosquito districts which will test using a commercial strip immunoassay and rapid assay instrument. The California Department of Health Services, the California Department of Food and Agriculture, and the University of California perform other viral tests of mosquitoes, birds, or mammals. The Glenn County Health and Human Services Agency has contracted with Glenn County Mosquito and Vector Control Program participated in the statewide dead bird surveillance program for West Nile virus, responding to reports of dead birds from the public. In the future, these results can be mapped using a Geographic Information System. Various County, State and private laboratories throughout California and elsewhere test humans and horses for WNV. The California Department of Health Services tries to obtain and compile human and horse test results from all testing facilities and reports them to the appropriate local mosquito control agencies.

The Program has found mosquito and other potential vector sources scattered throughout its Service Area. All properties within the Service Area are within mosquito-flying range of one or more mosquito sources. Furthermore, the Service Area has long suffered from mosquitoes and other vectors and includes a large number of sources.

Glenn County Valley-wide Mosquito Abatement District

Surveillance is conducted in a manner based upon an equal spread of resources throughout the Service Area, focusing on areas of likely sources. Treatment strategies are based upon the results of the surveillance program, and are specifically designed for individual area. The surveillance traps are located and spread throughout the Service Area in a balanced approach such that the traps measure mosquito levels throughout the Service Area.

Control: The Program intends to use several techniques to control permanent-water mosquito larvae, including biological, chemical, and physical control. Chemical control agents include the toxin of the natural bacteria *Bacillus thuringiensis israelensis* (Bti), which can be applied as either a liquid or a granule. This toxin must be eaten by larvae, restricting its use to the first through third instar stages of development. Bti has the tremendous advantage of specificity, only affecting mosquitoes and related groups of flies. The spores of *Bacillus sphaericus* (Bs) are also available for liquid spray or granular application. This product has the advantage over Bti of sometimes reproducing in the water, extending the life of its effectiveness. Bs is only effective against *Culex* and works well in highly polluted water. Methoprene is an analogue of a natural insect hormone that prevents successful development of larvae. It is available as a short-lived liquid and longer-acting granules and briquets. Finally, the Program may use a short life-cycle oil combined with surfactants in situations where the materials above will not work.

The Program may use the mosquito fish, *Gambusia affinis*, for biological control. These mosquito-eating fish work particularly well during warm months in decorative ponds, unused swimming pools, animal watering troughs, and a variety of other permanent, natural or artificial sources of standing water (stock ponds).

In the future, the Program may use physical control as required; its application can temporarily or permanently alter habitats so that they do not produce mosquitoes. Property owners and residents are educated to use physical control when it is appropriate. Examples of physical control include clearing vegetation around pond or stream banks, improving drainage, and providing access for other types of control work.

Monitoring: For the most part, monitoring is the continuation of surveillance activities. Staff specifically checks treatment sites to be sure that applications were successful. In addition to physically checking the site, traps can be utilized to evaluate the success of the program.

Floodwater Mosquitoes

Risk assessment: Freshwater floodwater species are an intermittent major pest and potential disease vector problem in the Service Area when irrigated pastures or wetland flood-up cause sudden increases in the numbers of *Aedes nigromaculis* and *Aedes melanimon*, which can also affect the very large surrounding areas. These species as well as *Aedes vexans* mosquitoes will frequently create pest and potential disease vector problems when their populations rise due to intermittently flooded areas. The Service Area is susceptible to seasonal flooding. The vector potential of all of these species is low in Glenn County, though the isolation of West Nile virus from a mosquito identified as *Aedes squamiger* in San Luis Obispo raises some concern about the potential for spread of this disease by floodwater mosquito species not normally thought of as vectors.

Monitoring: *Aedes melanimon*, *Aedes nigromaculis*, and *Aedes vexans* are aggressive day-time and night-time biters. As a result, public complaints are helpful in pinpointing intermittently flooded areas where these mosquitoes breed. Calls from the public help assess success or failure of treatments. However, field inspections of intermittently flooded areas known to create mosquito habitat can also be used by the Program to determine the need for treatment and to assess the effectiveness of treatments. Carbon dioxide baited traps are also an effective means of monitoring the adults of these species.

Public Relations, Outreach, and Education

The emergence of West Nile Virus has created a need for regular and fairly extensive media contacts, outreach and education. Health and Human Services Agency staff has introduced public relations, outreach, and educational materials when needed. This includes making press releases, publishing brochures, responding to requests for interviews from all media and contact with other government agencies. If the funding is available, the Program could develop an elementary school program. The Program's employees could visit classrooms to present information about mosquito and vector biology and control issues, as well as personal protection, and techniques used by Glenn County to control pests of public health importance.

Research and Testing

If requested, the Program will cooperate with University of California researchers and scientists to perform special research projects. These projects could be those that relate directly to operational problems so that the results enhance protection of health and property within the Service Area.

Glenn County Valley-wide Mosquito Abatement District

Assessment

WHEREAS, the Glenn County Board of Supervisors contracted with the undersigned Engineer of Work to prepare and file a report presenting an estimate of costs of Services, a diagram for the benefit assessment Service Area, an assessment of the estimated costs of Services, and the special benefit conferred thereby upon all assessable parcels within the Glenn County Valley-wide Mosquito Abatement District, Mosquito and Disease Control Assessment;

NOW, THEREFORE, the undersigned, by virtue of the power vested in me under Article XIID of the California Constitution, the Government Code and the Health and Safety Code and the order of the Glenn County Board of Supervisors, hereby make the following determination of an assessment to cover the portion of the estimated cost of said Services, and the costs and expenses incidental thereto to be paid by the Mosquito and Disease Control Assessment.

The amount to be paid for said Services and the expenses incidental thereto, to be paid by the Glenn County Valley-wide Mosquito Abatement District for fiscal year 2023-24 is generally as follows:

Figure 1 – Summary Expenditures Estimate – FY 2023-24 Budget

| Budget Item | Cost |
|--|------------|
| Vector & Disease Control Services | \$218,800 |
| Fixed Asset & Capital Equipment | \$0 |
| Dedicated Emergency Response Fund ¹ | \$0 |
| Subtotal (a) | \$218,800 |
| Less: | |
| Contribution from other Sources | -\$13,000 |
| Contribution from Fund Balance | -\$208,334 |
| Subtotal (b) | -\$221,334 |
| Incidentals (c) | \$13,000 |
| Net Amount To Assessments (a+b+c) | \$10,466 |

Notes:

1. The Program currently has a fully funded Working Capital Fund and Contingency Fund (as shown in Figure 2, below) and does not expect any expenditures from these funds for 2023-24. The Capital Replacement Fund is funded with one year's contribution of \$8,800 and no expenditures are expected from this fund for 2023-24.

Glenn County Valley-wide Mosquito Abatement District

An Assessment Diagram is hereto attached and made a part hereof showing the exterior boundaries of said Assessment Service Area. The distinctive number of each parcel or lot of land in the said Assessment Service Area is its Assessor Parcel Number appearing on the Assessment Roll.

I do hereby determine and apportion said net amount of the cost and expenses of said Services, including the costs and expenses incidental thereto, upon the parcels and lots of land within said Mosquito and Disease Control Assessment, in accordance with the special benefits to be received by each parcel or lot, from the Services, and more particularly set forth in the Cost Estimate hereto attached and by reference made a part hereof.

Said assessment determination is made upon the parcels or lots of land within said Assessment Service Area in proportion to the special benefits to be received by said parcels or lots of land, from said Services.

The assessment is subject to an annual adjustment tied to the Consumer Price Index for Northern California (the San Francisco Bay Area Index) as of December of each succeeding year (the CPI), with a maximum annual adjustment not to exceed 3%. The annual increase for fiscal year 2023-24, based on the yearly CPI change from December, 2022 is 4.8818%, and the maximum allowable rate for 2022-23 is \$31.89.

An annual rate of \$1.22 per Single Family Equivalent is proposed for 2023-24 which is a \$4.37 decrease from the 2022-23 rate of \$5.59, and is \$30.67 below the maximum allowable rate of \$31.89. (This proposed low rate results from lower-than-expected costs and the 2nd year continuation of efforts to “spend down” the fund balance as required by the adopted Glenn County Valley-wide MAD Program Fund Balance Policy in 2022-23. It was anticipated that this rate reduction would be for 2022-23 and 2023-24 only, and that the rate would be similar to previous rates beginning in 2024-25.)


Each parcel or lot of land is described in the Assessment Roll by reference to its parcel number as shown on the Assessor's Maps of the County of Glenn for the fiscal year 2023-24. For a more particular description of said property, reference is hereby made to the deeds and maps on file and of record in the office of the County Assessor of the County of Glenn.

I hereby place opposite the Assessor Parcel Number for each parcel or lot within the Assessment Roll, the proposed amount of the assessment for the fiscal year 2023-24 for each parcel or lot of land within the said Mosquito and Disease Control Assessment Service Area.

Glenn County Valley-wide Mosquito Abatement District

Dated: July 11, 2023

Engineer of Work



John W. Bliss, License No. C52091

Glenn County Valley-wide Mosquito Abatement District

Mosquito and Disease Control Assessment
Final Engineer's Report, FY 2023-24



Cost Estimate

Figure 2 – Cost Estimate – FY 2023-24 Budget

| Glenn County Mosquito Control Program | | | <i>Total</i> |
|--|---------------------------------------|------------------------------------|----------------------------------|
| Mosquito and Disease Control Assessment | | | <i>Budget</i> |
| Beginning Dedicated Fund Balance⁶ | | | \$400,634 |
| Working Capital Fund | (Fully funded amount = \$74,700) | | \$74,700 |
| Capital Replacement Fund | (Fully funded amount = \$ 88,000) | | \$17,600 |
| Contingency Fund | (Fully funded amount = \$100,000) | | \$100,000 |
| Fund Balance Overage (a) | | | \$208,334 |
| Vector Control Services and Related Expenditures | | | |
| Vector Control and Disease Prevention Operations | | | \$100,000 |
| Materials, Utilities and Supplies | | | \$110,000 |
| Capital Equipment and Fixed Assets | | | \$0 |
| Annual 10% (\$8,800) Contribution towards Capital Replacement Fund (Year 3) | | | \$8,800 |
| Total Vector Control Services and Related Expenditures (b) | | | \$218,800 |
| Less: | | | |
| Contributions from other Sources ¹ | | | (\$13,000) |
| Contribution from Fund Balance (from a, above) | | | (\$208,334) |
| Net Cost of Vector Control, Fixed Asset Equipment, Operation | | | (\$2,534) |
| Incidental Costs² | | | |
| Allowance for Uncollectable Assessments | | | \$1,000 |
| County Collection and Levy Administration, and Other Incidentals | | | \$12,000 |
| Total Mosquito, Vector & Disease Control Services and Incidentals⁵ | | | \$10,466 |
| (Net Amount to be Assessed) | | | |
| Budget Allocation to Property | | | |
| | Total SFE Units ³ | Assessment per SFE ⁴ | Total Assessment ⁵ |
| | 8,570.00 | \$1.22 | \$10,466 |
| | <i>Last Year's Rate</i> | \$5.59 | |
| | <i>Adjustment to Last Year's Rate</i> | (\$4.37) | |

Glenn County Valley-wide Mosquito Abatement District

Notes:

1. Contribution from other sources to cover the costs of any general benefits, and special benefits not funded by the assessments.
2. Incidental Costs includes allowance for uncollectible assessments from assessments on public agency parcels, county collection charges and assessment administration costs.
3. SFE Units means Single Family Equivalent benefit units. See method of assessment in the following Section for further definition.
4. The assessment rate per SFE is the total amount to assessment per Single Family Equivalent benefit unit.
5. The proceeds from the assessments will be deposited into a special fund for the Assessment. Funds raised by the assessment shall be used only for the purposes stated within this Report. Any balance remaining at the end of the fiscal year, June 30, must be carried over to the next fiscal year.
6. In early 2021, the Glenn County Board of Supervisors reviewed and approved a Fund Balance Policy for the assessment, including a Working Capital Fund which is fully funded at \$125,500; a Capital Replacement Fund which is fully funded at \$88,000, and a Contingency Fund which is fully funded at \$100,000. For 2021-22, the Working Capital Fund and Contingency Fund were fully funded and the Program did not incur any expenditures from the funds for 2021-22. The Capital Replacement Fund was funded with one year's contribution of \$8,800 and no expenditures were made from this fund for 2021-22. A review of the total fund balance indicated an overage of \$14,525 which was returned to the property owners in 2021-22 in the form of a reduced assessment as required by the plan. The reduction was \$0.98 per SFE.

In early 2022, an audit of the program projected a total fund balance of \$441,325.37. The Working Capital Fund and the Contingency Fund are both fully funded. However, the Capital Replacement Fund is only funded to \$8,800, with a plan to contribute \$8,800 each year until it is fully funded. As a result, the 2022-23 assessment rate is \$5.59 per Single Family Equivalent which is a reduction of \$22.20 per Single Family Equivalent.

For 2023-24, the excess fund balance will continue to be "spent down" consistent the 2022-2023 Fund Balance Policy. To be clear, the excess Fund Balance plus general benefit contribution less all annual costs justify a total assessment of only \$10,466, or \$1.22 per single family equivalent.

7. The assessment amounts are rounded down to the even penny for purposes of complying with the collection requirements from the County Auditor. Therefore, the total assessment amount for all parcels subject to the assessments may vary slightly from the net amount to be assessed.

Glenn County Valley-wide Mosquito Abatement District

Method of Assessment

This section of the Report includes an explanation of the benefits to be derived from the Services to be provided by the Glenn County Valley-wide Mosquito Abatement District, and the methodology used to apportion the total assessment to properties within the Mosquito and Disease Control Assessment Service Area.

The Mosquito and Disease Control Assessment Service Area consist of all Assessor Parcels in the Service Area in Glenn County as defined by the approved boundary description (see the Assessment Roll for a list of all the parcels included in the Mosquito and Disease Control Assessment Service Area).

The method used for apportioning the assessment is based upon the proportional special benefits to be derived by the properties in the Service Area over and above general benefits conferred on real property or to the public at large. The apportionment of special benefit is a multi step process, as shown below:

1. Identification of total benefit to the properties derived from the Services
2. Calculation of the proportion of these benefits that are special vs. general
3. Determination of the relative special benefit within different areas within the Service Area
4. Determination of the relative special benefit per property type and property characteristic
5. Calculation of the specific assessment for each individual parcel based upon special vs. general benefit; location, property type and property characteristics,

Discussion of Benefit

The below benefit factors, when applied to property in the Service Area, confer special benefits to property and ultimately improve the safety, utility, functionality and usability of property in the Service Area. These are special benefits to property in the Service Area in much the same way that storm drainage, sewer service, water service, lighting, sidewalks and paved streets enhance the safety, utility and functionality of each parcel of property served by these improvements, providing them with more utility of use and making them safer and more usable for occupants.

Glenn County Valley-wide Mosquito Abatement District

It should also be noted that Proposition 218 included a requirement that existing assessments in effect upon its effective date were required to be confirmed by either a majority vote of registered voters in the Service Area, or by weighted majority property owner approval using the new ballot proceeding requirements. However, certain assessments were excluded from these voter approval requirements. Of note is that in California Constitution Article XIID Section 5(a) this special exemption was granted to assessments for sidewalks, streets, sewers, water, flood control, drainage systems and vector control. The Howard Jarvis Taxpayers Association explained this exemption in their Statement of Drafter's Intent:

*"This is the "traditional purposes" exception. These existing assessments do not need property owner approval to continue. However, future assessments for these traditional purposes are covered."*²

Therefore, the drafters of Proposition 218 acknowledged that vector control assessments were a "traditional" and therefore acknowledged and accepted use.

Since all assessments, existing before or after Proposition 218 must be based on special benefit to property, the drafters of Proposition 218 inherently found that vector control services confer special benefit on property. Moreover, the statement of drafter's intent also acknowledges that any new or increased vector control assessments after the effective date of Proposition 218 would need to comply with the voter approval requirements it established. This is as an acknowledgement that additional assessments for such "traditional" purposes would be established after Proposition 218 was in effect. Therefore, the drafters of Proposition 218 clearly recognized vector assessments as a "traditional" use of assessments, acknowledged that new vector assessments may be formed after Proposition 218 and inherently were satisfied that vector control services confer special benefit to properties.

The Legislature also made a specific determination after Proposition 218 was enacted that vector control services constitute a proper subject for special assessment. Health and Safety Code section 2082, which was signed into law in 2002, provides that a district may levy special assessments consistent with the requirements of Article XIID of the California Constitution to finance vector control projects and programs. The intent of the Legislature to allow and authorize benefit assessments for vector control services after Proposition 218 is shown in the Assembly and Senate analysis the Mosquito Abatement and Vector Control District Law where it states that the law:

² Howard Jarvis Taxpayers Association, "Statement of Drafter's Intent", January 1997.

Glenn County Valley-wide Mosquito Abatement District

Allows special benefit assessments to finance vector control projects and programs, consistent with Proposition 218.³

Therefore the State Legislature unanimously found that vector control services are a valuable and important public service that can be funded by benefit assessments. To be funded by assessments, vector control services must confer special benefit to property.

Mosquito Control Is a Special Benefit to Properties

As described below, this Engineer's Report concludes that mosquito control is a special benefit that provides direct advantages to property in the Service Area. For example, if approved, the assessment would provide reduced levels of mosquitoes on property throughout the Service Area. Moreover, the assessment reduces the risk of the presence of diseases on property throughout the Service Area, which is another direct advantage received by property in the Service Area. Moreover, the assessment funds Services that improve the use of property and reduce the nuisance and harm created by vectors on property throughout the Service Area. These are tangible and direct special benefits that are received by property throughout the specific area covered by the Assessment.

The following section, Benefit Factors, describes how and why vector control services specially benefit properties in the Service Area. These benefits are particular and distinct from its effect on property in general or the public at large.

Benefit Factors

In order to allocate the assessments, the Engineer identified the types of special benefit arising from the aforementioned Services and that would be provided to property in the Service Area. The following benefit factors have been established that represent the types of special benefit to parcels resulting from the Services to be financed with the assessment proceeds. These types of special benefit are as follows:

Reduced mosquito populations on property and as a result, enhanced desirability, utility, usability and functionality of property in the Service Area

³ Senate Bill 1588, Mosquito Abatement and Vector Control District Law, Legislative bill analysis

The assessments provide enhanced services for the control and abatement of nuisance and disease-carrying mosquitoes. These Services materially reduce the number of mosquitoes on properties throughout the Service Area. The lower mosquito populations on property in the Service Area is a direct advantage to property that serves to increase the desirability and “usability” of property. Clearly, properties are more desirable and usable in areas with lower mosquito populations and with a reduced risk of vector-borne disease. This is a special benefit to residential, commercial, agricultural, industrial and other types of properties because all such properties directly benefits from reduced mosquito populations and properties with lower mosquito populations are more usable, functional and desirable.

Excessive mosquitoes in the area can materially diminish the utility and usability of property. For example, prior to the commencement of mosquito control and abatement services, properties in many areas in the State were considered to be nearly uninhabitable during the times of year when the mosquito populations were high.⁴ The prevention or reduction of such diminished utility and usability of property caused by mosquitoes is a clear and direct advantage and special benefit to property in the Service Area.

The State Legislature made the following finding on this issue:

“Excess numbers of mosquitoes and other vectors spread diseases of humans, livestock, and wildlife, reduce enjoyment of outdoor living spaces, both public and private, reduce property values, hinder outdoor work, reduce livestock productivity; and mosquitoes and other vectors can disperse or be transported long distances from their sources and are, therefore, a health risk and a public nuisance; and professional mosquito and vector control based on scientific research has made great advances in reducing mosquito and vector populations and the diseases they transmit.”⁵

⁴ Prior to the commencement of modern mosquito control services, areas in the State of California such as the San Mateo Peninsula, Napa County, Lake County and areas in Marin and Sonoma Counties had such high mosquito populations or other vector populations that they were considered to be nearly unlivable during certain times of the year and were largely used for part-time vacation cottages that were occupied primarily during the months when the natural vector populations were lower.

⁵ Assembly Concurrent Resolution 52, chaptered April 1, 2003

Glenn County Valley-wide Mosquito Abatement District

Mosquitoes emerge from sources throughout the Service Area, and with an average flight range of two miles, mosquitoes from known sources can reach all properties in the Service Area. These sources include standing water in rural areas, such as marshes, pools, wetlands, ponds, drainage ditches, drainage systems, tree holes and other removable sources such as old tires and containers. The sources of mosquitoes also include numerous locations throughout the urban areas in the Service Area. These sources include underground drainage systems, containers, unattended swimming pools, leaks in water pipes, tree holes, flower cups in cemeteries, over-watered landscaping and lawns, rice and other agricultural fields, and many other sources. By controlling mosquitoes at known and new sources, the Services materially reduces mosquito populations on property throughout the Service Area.

A recently increasing source of mosquitoes is unattended swimming pools:

“Anthropogenic landscape change historically has facilitated outbreaks of pathogens amplified by peridomestic vectors such as Cx. pipiens complex mosquitoes and associated commensals such as house sparrows. The recent widespread downturn in the housing market and increase in adjustable rate mortgages have combined to force a dramatic increase in home foreclosures and abandoned homes and produced urban landscapes dotted with an expanded number of new mosquito habitats. These new larval habitats may have contributed to the unexpected early season increase in WNV cases in Bakersfield during 2007 and subsequently have enabled invasion of urban areas by the highly competent rural vector Cx. tarsalis. These factors can increase the spectrum of competent avian hosts, the efficiency of enzootic amplification, and the risk for urban epidemics.”⁶

⁶ Riesen William K. (2008). Delinquent Mortgages, Neglected Swimming Pools, and West Nile Virus, California. Emerging Infectious Diseases. Vol. 14(11).

Increased safety of property in the Service Area.

The assessments have resulted in improved proactive Services to control and abate mosquitoes that otherwise would occupy properties throughout the Service Area. Mosquitoes are transmitters of diseases, so the reduction of mosquito populations makes property safer for use and enjoyment. In absence of the assessments, these Services would not be provided, so the Services funded by the assessments make properties in the Service Area safer, which is a distinct special benefit to property in the Service Area.⁷ This is not a general benefit to property in the Service Area or the public at large because the Services are tangible mosquito and disease control services that is provided directly to the properties in the Service Area and the Services are over and above what otherwise would be provided by the District or any other agency.

This finding was confirmed in 2003 by the State Legislature:

“Mosquitoes and other vectors, including but not limited to, ticks, Africanized honey bees, rats, fleas, and flies, continue to be a source of human suffering, illness, death, and a public nuisance in California and around the world. Adequately funded mosquito and vector control, monitoring and public awareness programs are the best way to prevent outbreaks of West Nile Virus and other diseases borne by mosquitoes and other vectors.”⁸

Also, the Legislature, in Health and Safety Code Section 2001, finds that:

“The protection of Californians and their communities against the discomforts and economic effects of vectorborne diseases is an essential public service that is vital to public health, safety, and welfare.”

Reductions in the risk of new diseases and infections on property in the Service Area

Mosquitoes have proven to be a major contributor to the spread of new diseases such as West Nile Virus, among others. A highly mobile population combined with migratory bird patterns can introduce new mosquito-borne diseases into previously unexposed areas.

“Vector-borne diseases (including a number that are mosquito-borne) are a major public health problem internationally. In the United States, dengue and malaria are frequently brought back from tropical and subtropical countries by travelers or migrant laborers, and autochthonous transmission of malaria and dengue occasionally occurs. In 1998, 90 confirmed cases of dengue and 1,611 cases of

⁷ By reducing the risk of disease and increasing the safety of property, the proposed Services will materially increase the usefulness and desirability of certain properties in the Assessment Area.

⁸ Assembly Concurrent Resolution 52, chaptered April 1, 2003

malaria were reported in the USA and dengue transmission has occurred in Texas.”⁹

“During 2004, 40 states and the District of Columbia (DC) have reported 2,313 cases of human WNV illness to CDC through ArboNET. Of these, 737 (32%) cases were reported in California, 390 (17%) in Arizona, and 276 (12%) in Colorado. A total of 1,339 (59%) of the 2,282 cases for which such data were available occurred in males; the median age of patients was 52 years (range: 1 month--99 years). Date of illness onset ranged from April 23 to November 4; a total of 79 cases were fatal.”¹⁰ (According to the Centers for Disease Control and Prevention on January 19, 2004, a total of 2,470 human cases and 88 human fatalities from WNV have been confirmed).

A study of the effect of aerial spraying conducted by the Sacramento-Yolo Mosquito and Vector Control District (SYMVCD) to control a West Nile Virus disease outbreak found that the SYMVCD’s mosquito control efforts materially decreased the risk of new diseases in the treated areas:

After spraying, infection rates decreased from 8.2 (95% CI 3.1–18.0) to 4.3 (95% CI 0.3–20.3) per 1,000 females in the spray area and increased from 2.0 (95% CI 0.1–9.7) to 8.7 (95% CI 3.3–18.9) per 1,000 females in the untreated area. Furthermore, no additional positive pools were detected in the northern treatment area during the remainder of the year, whereas positive pools were detected in the untreated area until the end of September (D.-E.A Elnaiem, unpub. data). These independent lines of evidence corroborate our conclusion that actions taken by SYMVCD were effective in disrupting the WNV transmission cycle and reducing human illness and potential deaths associated with WNV.¹¹

The Services funded by the assessments help prevent on a focused basis the presence of vector-borne diseases on property in the Service Area. This is another tangible and direct special benefit to property in the Service Area that would not be received in absence of the assessments.

⁹ Rose, Robert. (2001). Pesticides and Public Health: Integrated Methods of Mosquito Management. Emerging Infectious Diseases. Vol. 7(1); 17-23.

¹⁰ Center for Disease Control. (2004). West Nile Virus Activity --- United States, November 9--16, 2004. Morbidity and Mortality Weekly Report. 53(45); 1071-1072.

¹¹ Carney, Ryan. (2008), Efficiency of Aerial Spraying of Mosquito Adulticide in Reducing the Incidence of West Nile Virus, California, 2005. Emerging Infectious Diseases, Vol 14(5)

Glenn County Valley-wide Mosquito Abatement District

Protection of economic activity on property in the Service Area.

As demonstrated by the SARS (2002-2004) outbreak in China and outbreaks of Avian Flu, outbreaks of pathogens can materially and negatively impact economic activity in the affected area. Such outbreaks and other public health threats can have a drastic negative effect on tourism, business and residential activities in the affected area. The assessments help to prevent the likelihood of such outbreaks in the District.

Mosquitoes hinder, annoy and harm residents, guests, visitors, farm workers, and employees. A vector-borne disease outbreak and other related public health threats would have a drastic negative effect on agricultural, business and residential activities in the Service Area.

The economic impact of diseases is well documented. According to a study prepared for the Centers for Disease Control and Prevention, economic losses due to the transmission of West Nile Virus in Louisiana was estimated to cost over \$20 million over approximately one year:

*The estimated cost of the Louisiana epidemic was \$20.1 million from June 2002 to February 2003, including a \$10.9 million cost of illness (\$4.4 million medical and \$6.5 million nonmedical costs) and a \$9.2 million cost of public health response. These data indicate a substantial short-term cost of the WNV disease epidemic in Louisiana.*¹²

Moreover, a study conducted in 1996-97 of La Crosse Encephalitis (LACE), a human illness caused by a mosquito-transmitted virus, found a lifetime cost per human case at \$48,000 to \$3,000,000 and found that the disease significantly impacted lifespans of those who were infected. Following is a quote from the study which references the importance and value of active vector control services of the type that would be funded by the assessments:

*The socioeconomic burden resulting from LACE is substantial, which highlights the importance of the illness in western North Carolina, as well as the need for active surveillance, reporting, and prevention programs for the infection.*¹³

¹² Zohrabian A, Meltzer MI, Ratard R, Billah K, Molinari NA, Roy K, et al. West Nile Virus economic impact, Louisiana, 2002. Emerging Infectious Disease, 2004 Oct. Available from <http://www.cdc.gov/ncidod/EID/vol10no10/03-0925.htm>

¹³ Utz, J. Todd, Apperson, Charles S., McCormack, J. Newton, Salyers, Martha, Dietz, E. Jacquelin, Mcpherson, J. Todd, Economic And Social Impacts Of La Crosse Encephalitis In Western North Carolina, Am J Trop Med Hyg 2003 69: 509-518

The Services funded by the assessments help prevent the likelihood of such outbreaks on property in the Service Area and reduces the harm to economic activity on property caused by existing mosquito populations. This is another direct advantage received by property in the Service Area that would not be received in absence of the assessments.

Protection of Service Area’s agriculture, tourism, and business industries.

The agriculture, tourism and business industries benefit from reduced levels of harmful or nuisance mosquitoes. Conversely, any outbreaks of emerging vector-borne pathogens such as West Nile Virus could also materially negatively affect these industries. Diseases transmitted by mosquitoes can adversely impact business and recreational functions.

A study prepared for the United States Department of Agriculture in 2003 found that over 1,400 horses died from West Nile Virus in Colorado and Nebraska and that these fatal disease cases created over \$1.2 million in costs and lost revenues. In addition, horse owners in these two states spent over \$2.75 million to vaccinate their horses for this disease. The study states that “Clearly, WNV has had a marked impact on the Colorado and Nebraska equine industry.”¹⁴

Pesticides for mosquito control impart economic benefits to agriculture in general. Anecdotal reports from farmers and ranchers indicate that cattle, if left unprotected, can be exsanguinated by mosquitoes, especially in Florida and other southeast coastal areas. Dairy cattle produce less milk when bitten frequently by mosquitoes¹⁵

The assessments serve to protect the businesses and industries and the employees and residents that benefit from these businesses and industries. This is a direct advantage and special benefit to property in the Service Area.

Reduced risk of nuisance and liability on property in the Service Area

In addition to health related factors, uncontrolled mosquito populations create a nuisance for the occupants of property in the Service Area. Properties in the Service Area, therefore, benefit from the reduced nuisance factor that will be created by the Services. Agricultural and rangeland properties also benefit from the reduced nuisance factor and harm to livestock and employees from lower mosquito populations.

¹⁴ S. Geiser, A. Seitzinger, P. Salazar, J. Traub-Dargatz, P. Morley, M. Salman, D. Wilmot, D. Steffen, W. Cunningham, Economic Impact of West Nile Virus on the Colorado and Nebraska Equine Industries: 2002, April 2003, Available from http://www.aphis.usda.gov/vs/ceah/cnabs/nahms/equine/wnv2002_CO_NB.pdf

¹⁵ Jennings, Allen. (2001). USDA Letter to EPA on Fenthion IRED. United States Department of Agriculture, Office of Pest Management Policy. March 8, 2001.

Agricultural, range, golf course, cemetery, open space and other such lands in the Service Area contain large areas of mosquito habitat and are therefore a significant source of mosquito populations. In addition, residential and business properties in the Service Area can also contain significant sources.¹⁶ It is conceivable that sources of mosquitoes could be held liable for the transmission of diseases or other harm. For example, in August 2004, the City of Los Angeles approved new fines of up to \$1,000 per day for property owners who don't remove standing water sources of mosquitoes on their property.

The Services serve to protect the businesses and industries in the Service Area. This is a direct advantage and a special benefit to property in the Service Area.

Benefit Finding

In summary, the direct special benefits described in this Report ultimately enhance the economic values of all benefiting real properties in excess of the assessments for these properties. Therefore, the assessment engineer finds that the cumulative benefits to property from the Services are reasonably equal or greater than the assessment of only \$1.22 per home and benefit unit. (Please see Note 6 of Table 2 for a discussion of the 2023-24 rate)

General vs. Special Benefit

Article XIII C of the California Constitution requires any local agency proposing to increase or impose a benefit assessment to "separate the general benefits from the special benefits conferred on a parcel." The rationale for separating special and general benefits is to ensure that property owners subject to the benefit assessment are not paying for general benefits. The assessment can fund the special benefits to property in the Assessment Area but cannot fund any general benefits. Accordingly, a separate estimate of the special and general benefit is given in this section.

In other words:

$$\text{Total Benefit} = \text{General Benefit} + \text{Special Benefit}$$

¹⁶ Sources of mosquitoes on residential, business, agricultural, range and other types of properties include removable sources such as containers that hold standing water.

There is no widely-accepted or statutory formula for general benefit from vector control services. General benefits are benefits from improvements or services that are not special in nature, are not “particular and distinct” and are not “over and above” benefits received by other properties. General benefits are conferred to properties located “in the district,¹⁷” but outside the narrowly-drawn Service Area and to “the public at large.” SVTA vs. SCCOSA provides some clarification by indicating that general benefits provide “an indirect, derivative advantage” and are not necessarily proximate to the improvements and services funded by the assessments.

A formula to estimate the general benefit is listed below:

| | | | | | | |
|------------------------|----------|---|----------|--|----------|-----------------------------------|
| General Benefit | = | Benefit to real property outside of improvement district | + | Benefit to real property inside of improvement district | + | Benefit to public at large |
|------------------------|----------|---|----------|--|----------|-----------------------------------|

¹⁷ SVTA vs. SCCOSA explains as follows:

OSA observes that Proposition 218’s definition of “special benefit” presents a paradox when considered with its definition of “district.” Section 2, subdivision (i) defines a “special benefit” as “a particular and distinct benefit over and above general benefits conferred on real property located in the district or to the public at large.” (Art. XIII D, § 2, subd. (i), italics added.) Section 2, subdivision (d) defines “district” as “an area determined by an agency to contains all parcels which will receive a special benefit from a proposed public improvement or property-related service.” (Art. XIII D, § 2, subd. (d), italics added.)

In a well-drawn district — limited to only parcels receiving special benefits from the improvement — every parcel within that district receives a shared special benefit. Under section 2, subdivision (i), these benefits can be construed as being general benefits since they are not “particular and distinct” and are not “over and above” the benefits received by other properties “located in the district.”

We do not believe that the voters intended to invalidate an assessment district that is narrowly drawn to include only properties directly benefiting from an improvement. Indeed, the ballot materials reflect otherwise. Thus, if an assessment district is narrowly drawn, the fact that a benefit is conferred throughout the district does not make it general rather than special.

Glenn County Valley-wide Mosquito Abatement District

Special benefit, on the other hand, is defined in the state constitution as “a particular and distinct benefit over and above general benefits conferred on real property located in the district or to the public at large.” The SVTA v. SCCOSA decision indicates that a special benefit is conferred to a property if it “receives a direct advantage from the improvement (e.g., proximity to a park).” In this assessment, the overwhelming proportion of the benefits conferred to property is special, since the advantages from the mosquito and disease control/protection funded by the Assessments are directly received by the properties in the Service Area and are only minimally received by property outside the Service Area or the public at large.

Proposition 218 twice uses the phrase “over and above” general benefits in describing special benefit. (Art. XIID, sections 2(i) & 4(f).) Prior to the assessment there was effectively no mosquito related services being provided to the Service Area. Consequently, by the Program services are over and above this baseline. Arguably, all of the Services funded by the assessment therefore are special benefit because the Services particularly and distinctly benefit and protect the Service Area over and above the previous baseline benefits and service.

Nevertheless, arguably some of the Services benefit the public at large and properties outside the Assessment District. In this report, the general benefit is conservatively estimated and described, and then budgeted so that it is funded by sources other than the assessment.

Calculating General Benefit

Without this assessment the Program would lack the funds to provide the Service Area. Consistent with footnote 8 of SVTA v. SCCOSA, and for the reasons described above, the Program has determined that all parcels in the Service Area receive a shared direct advantage and special benefit from the Services. The Services directly and particularly serve and benefit each parcel, and are not a mere indirect, derivative advantage. As explained above, Proposition 218 relies on the concept of “over and above” in distinguishing special benefits from general benefits. As applied to an assessment proceeding concurrent with the annexation this concept means that all vector control services, which provide direct advantage to property in the Assessment District, are over and above the baseline and therefore are special.

Nevertheless, the Services may provide a degree of general benefit, in addition to the predominant special benefit. This section provides a conservative measure of the general benefits from the Assessments.

Benefit to Property Outside the District

Properties within the Assessment District receive almost all of the special benefits from the Services because the Services funded by the Assessments are provided directly to protect property within the Assessment District from mosquitoes-borne diseases. However, properties adjacent to, but just outside of, the boundaries may receive some benefit from the Services in the form of reduced mosquito populations on property outside the Assessment District. Since this benefit, is conferred to properties outside the Program boundaries, it contributes to the overall general benefit calculation and is not funded by the assessment.

A measure of this general benefit is the proportion of Services that would affect properties outside of the Assessment District. Each year, the Program provides some of its Services in areas near the boundaries of the Service Area. By abating mosquito populations near the borders of the Service Area, the Services could provide benefits in the form of reduced mosquito populations and reduced risk of disease transmission to properties outside the Service Area. If mosquitoes were not controlled inside the Service Area, more of them would fly from the Service Area. Therefore control of mosquitoes within the Service Area provides some benefit to properties outside the Service Area but within the normal flight range of mosquitoes, in the form of reduced mosquito populations and reduced disease transmission. This is a measure of the general benefits to property outside the Assessment District because this is a benefit from the Services that is not specially conferred upon property in the assessment area.

Criteria:

Mosquitoes may fly up to 2 MILES from their breeding source.

2000 parcels within 2 miles of, but outside of the District, may receive some mosquito and disease protection benefit (includes portions of Willows)

6% portion of relative benefit that is received

9,116 Parcels in the District

Calculations:

Total Benefit = 2000 parcels * 6% = 120 parcels equivalents

Percentage of overall parcel equivalents = $(120 / (120 + 9,116)) = 1.3 \%$

The mosquito potential outside the Assessment District is based on studies of mosquito dispersion concentrations. Mosquitoes can travel up to two miles, on average, so this destination range is used. Based on studies of mosquito destinations, relative to parcels in the Service Area average concentration of mosquitoes from the Service Area on properties within two miles of the Service Area is calculated to be 6%.¹⁸ This relative vector population reduction factor within the destination range is combined with the number of parcels outside the Service Area and within the destination range to measure this general benefit and is calculated as follows:

Therefore, for the overall benefits provided by the Services to the Assessment District, it is determined that 1.3% of the benefits would be received by the parcels within two miles of the Assessment District boundaries.

¹⁸ Tietze, Noor S., Stephenson, Mike F., Sidhom, Nader T. and Binding, Paul L., "Mark-Recapture of *Culex Erythrothorax* in Santa Cruz County, California", Journal of the American Mosquito Control Association, 19(2):134-138, 2003.

Glenn County Valley-wide Mosquito Abatement District

Benefit to Property *Inside* the District that is *Indirect and Derivative*

The “indirect and derivative” benefit to property within the Assessment District is particularly difficult to calculate. As explained above, all benefit within the Assessment District is special because the mosquito and disease control services in the Assessment District would provide direct service and protection that is clearly “over and above” and “particular and distinct” when compared with the level of such protection under current conditions. Further the properties are within the Service Area boundaries and this Engineer’s Report demonstrates the direct benefits received by individual properties from mosquito and disease control services.

In determining the Service Area, the Program was careful to limit it to an area of parcels that will directly receive the Services. All parcels directly benefit from the surveillance, monitoring and treatment that are provided on an equivalent basis throughout the Service Area in order to maintain the same improved level of protection against mosquitoes and other vectors and reduced mosquito populations throughout the area. The surveillance and monitoring sites would be spread on a balanced basis throughout the area. Mosquito control and treatment would be provided as needed throughout the area based on the surveillance and monitoring results. The shared special benefit - reduced mosquito levels and reduced presence of mosquito-borne diseases - would be received on an equivalent basis by all parcels in the Service Area. Furthermore, all parcels in the Service Area directly benefit from the ability to request service from the Program and to have a Program field technician promptly respond directly to the parcel and address the owner’s or resident’s service need. The SVTA vs. SCCOSA decision indicates that the fact that a benefit is conferred throughout the Service Area does not make the benefit general rather than special, so long as the Assessment district is narrowly drawn and limited to the parcels directly receiving shared special benefits from the service. This concept is particularly applicable in situations involving a landowner-approved assessment-funded extension of a local government service to benefit lands previously not receiving that particular service. The Program therefore concludes that, other than the small general benefit to properties outside the Service Area (discussed above) and to the public at large (discussed below), all of the benefits of the Services to the parcels within the Assessment District are special benefits and it is not possible or appropriate to separate any general benefits from the “indirect and derivative” benefits conferred on parcels in the Assessment District.

Benefit To The Public At Large

With the type and scope of Services to be provided to the Assessment District, it is very difficult to calculate and quantify the scope of the general benefit conferred on the public at large. Because the Services directly serve and benefit all of the property in the Assessment Area, any general benefit conferred on the public at large would be small. Nevertheless, there would be some indirect general benefit to the public at large.

The public at large uses the public highways, and other regional facilities, when traveling in and through the Assessment Area they benefit from the Services. A fair and appropriate measure of the general benefit to the public at large therefore is the amount of highway and other regional facilities area within the Assessment Area relative to the overall land area. An analysis of maps of the Assessment Area shows that approximately 3.5% of the land area in the Assessment Area is covered by highways, and other regional facilities. This 3.5% therefore is a fair and appropriate measure of the general benefit to the public at large within the Assessment Area

Summary of General Benefits

Using a sum of the measures of general benefit for the public at large and land outside the Assessment Area, we find that approximately 5.0% of the benefits conferred by the Mosquito and Disease Control Assessment may be general in nature and should be funded by sources other than the Assessment.

General Benefit Calculation

| | | |
|----------|--------------|--|
| | 1.3% | (Outside the Assessment District) |
| + | 0.0% | (Inside the District – indirect and Derivative) |
| + | 3.59% | (Public at Large) |
| | = 4.8 | ≈ 5.0% (Total General Benefit) |

Although this analysis supports the findings that 4.8% of the assessment may provide general benefit only, this number is increased by the Assessment Engineer to 5% to conservatively ensure that no assessment revenue is used to support general benefit. This additional amount allocated to general benefit also covers general benefit to parcels in the Assessment Area if it is later determined that there is some general benefit conferred on those parcels.

The Mosquito and Disease Control Assessment total budget for mosquito abatement, disease control, and capital improvement is \$218,800. Of this total budget amount, Glenn County will contribute \$13,000 or over 5% of the total budget, from sources other than the Mosquito and Disease Control assessment. This contribution offsets any general benefits, estimated as 5%, from the Mosquito and Disease Control Assessment Services.

(In the 2009 Dahms case, the court upheld an assessment that was 100% special benefit on the rationale that the services funded by the assessments were directly provided to property in the assessment district. Similar to the assessments in Pomona that were validated by Dahms, the Assessments described in this Engineer's Report fund mosquito, control services directly provided to property in the assessment area. Moreover, as noted in this Report, the Services directly reduce mosquito populations on all property in the assessment area. Therefore, Dahms establishes a basis for minimal or zero general benefits from the Assessments. However, in this report, the general benefit is more conservatively estimated and described, and then budgeted so that it is funded by sources other than the assessment.)

Method of Assessment

As previously discussed, the Assessments fund enhanced, comprehensive, focused mosquito control, disease surveillance and control Services that reduce mosquito populations on property and clearly confer special benefits to properties in the Assessment Area. These benefits can also partially be measured by the occupants on property in the Improvement District because such parcel population density is a measure of the relative benefit a parcel receives from the Improvements. Therefore, the apportionment of benefit is partially based the population density of parcels. It should be noted that many other types of "traditional" assessments also use parcel population densities to apportion the assessments. For example, the assessments for sewer systems, roads and water systems are typically allocated based on the population density of the parcels assessed.

As previously discussed, the assessments fund focused mosquito control and disease surveillance and control Services that clearly confer special benefits to the underlying properties in the Service Area. These benefits are initially enjoyed by the property owners, guests, employees, tenants, pets and animals who enjoy a more habitable, safer and more desirable place to live, work or visit. As noted, these benefits ultimately flow to the underlying property.

Glenn County Valley-wide Mosquito Abatement District

Therefore, the apportionment of benefit is largely based on people who potentially live on, work at, or otherwise use the property. This methodology of determining benefit to property through the extent of use by people is a commonly used method of apportionment of benefits from assessments.

Such an approach of apportioning assessments based on population factors is commonly used. Moreover, assessments have a long history of use in California and are in large part based on the principle that any benefits from a service or improvement funded by assessments that is enjoyed by tenants and other non-property owners ultimately is conferred to the underlying property.¹⁹

With regard to benefits and source locations, the assessment engineer determined that since mosquitoes readily fly from their breeding locations to all properties in their flight range and since mosquitoes are actually attracted to properties occupied by people or animals, the benefits from mosquito control extend beyond the source locations to all properties that would be a “destination” for mosquitoes and other vectors. In other words, the control and abatement of mosquito populations ultimately confers benefits to all properties that are a destination of mosquitoes, rather than just those that are sources of mosquitoes.

¹⁹ For example, in *Federal Construction Co. v. Ensign* (1922) 59 Cal.App. 200 at 211, the appellate court determined that a sewer system specially benefited property even though the direct benefit was to the people who used the sewers: “Practically every inhabitant of a city either is the owner of the land on which he resides or on which he pursues his vocation, or he is the tenant of the owner, or is the agent or servant of such owner or of such tenant. And since it is the inhabitants who make by far the greater use of a city’s sewer system, it is to them, as lot owners or as tenants, or as the servants or agents of such lot owners or tenants, that the advantages of actual use will redound. But this advantage of use means that, in the final analysis, it is the lot owners themselves who will be especially benefited in a financial sense.”

Glenn County Valley-wide Mosquito Abatement District

And, although some primary mosquito sources may be located outside of urban areas, urban residential properties can and do generate their own, often significant, populations of mosquitoes organisms. For example, storm water catch basins exist throughout the urbanized areas in the Service Area and they are a common source of mosquitoes in urban areas. Since the typical flight range for a female Culex pipien mosquito is over ½ mile, most homes in the Service Area are within the flight zone of many catch basin/mosquito sources. Moreover, there are many other common urban sources of mosquitoes. These include backyard containers, green swimming pools, leaking water pipes and tree-holes. Clearly, there is a potential for mosquito sources on virtually all property. More importantly, all properties in the Service Area are within the destination range of mosquitoes and most properties are actually within the destination range of multiple mosquito source locations.

Because mosquitoes can rapidly and readily fly from their breeding locations to other properties over a large area and because there are current or potential breeding sources literally everywhere in the Service Area, the assessment engineer determined that all similar properties have generally equivalent mosquito “destination” potential and, therefore, receive equivalent levels of benefit.

In the process of determining the appropriate method of assessment, the Engineer considered various alternatives. For example, a fixed assessment amount per parcel for all residential improved property was considered but was determined to be inappropriate because agricultural lands, commercial property and other property also receive benefits from the assessments. Likewise, an assessment exclusively for agricultural land was considered but deemed inappropriate because other types of property, such as residential and commercial, also receive the special benefit factors described previously.

A fixed or flat assessment was deemed to be inappropriate because larger residential, commercial and industrial properties receive a higher degree of benefit than other similarly used properties that are significantly smaller. (For two properties used for commercial purposes, there is clearly a higher benefit provided to a property that covers several acres in comparison to a smaller commercial property that is on a 0.25 acre site. The larger property generally has a larger coverage area and higher usage by employees, customers, tourists and guests that benefit from reduced mosquito populations, as well as the reduced threat from diseases carried by mosquitoes and other vectors. This benefit ultimately flows to the property.) Larger commercial, industrial and apartment parcels, therefore, receive an increased benefit from the assessments.

In conclusion, the assessment engineer determined that the appropriate method of assessment should be based on the type and use of property, the relative size of the property and its relative population and usage potential. This method is further described below.

Zones of Benefit

The Glenn County Valley-wide Mosquito Abatement District's mosquito and disease control programs, projects and Services that are funded by the Mosquito and Disease Control Assessment are provided in all areas within the narrowly drawn Service Area's boundaries. Analysis of proposed mosquito control services in the western, foothill portion of the County concluded that this area should not receive services. In the narrowly drawn remaining portion of the valley floor – the current Services Area - , parcels of similar type receive similar mosquito abatement benefits on a per parcel and land area basis. Therefore, zones of benefit within the Service Area are not justified.

Additional Information regarding Mosquito Control in Hamilton City

History of Recent Assessments in Hamilton City

The County has assessed the parcels for enhanced service level in Hamilton City as follows:

| | |
|-----------|---------|
| ▪ 2010-11 | \$ 0.00 |
| ▪ 2011-12 | \$ 0.00 |
| ▪ 2012-13 | \$ 0.00 |
| ▪ 2013-14 | \$ 0.00 |
| ▪ 2014-15 | \$ 0.00 |
| ▪ 2015-16 | \$ 0.00 |
| ▪ 2016-17 | \$ 0.00 |
| ▪ 2017-18 | \$ 0.00 |
| ▪ 2018-19 | \$ 0.00 |
| ▪ 2019-20 | \$ 0.00 |
| ▪ 2020-21 | \$ 0.00 |
| ▪ 2021-22 | \$ 0.00 |
| ▪ 2022-23 | \$ 0.00 |
| ▪ 2023-24 | \$ 0.00 |

Glenn County Valley-wide Mosquito Abatement District

No services will be provided to Hamilton City for 2023-24, and Hamilton City parcels will not be assessed.

Assessment Apportionment

The special benefits derived from the Mosquito and Disease Control Assessment are conferred on property and are not based on a specific property owner's occupancy of property or the property owner's demographic status, such as age or number of dependents. However, it is ultimately people who do or could use the property and who enjoy the special benefits described above. Therefore, the opportunity to use and enjoy the region within the Service Area without the excessive nuisance, diminished "livability" or the potential health hazards brought by mosquitoes, vectors, and the diseases they carry is a special benefit to properties in the Service Area. This benefit is related to the number of people who potentially live on, work at, visit or otherwise use the property, because people ultimately determine the value of the benefits by choosing to live, work and/or recreate in the area, and by choosing to purchase property in the area.²⁰

The special benefit conferred upon a specific parcel is derived as a sum function of the applicable special benefit type (such as improved safety (i.e. disease risk reduction) on a parcel for a mosquito assessment) and a parcel-specific attributes (such as the number of residents living on the parcel for a mosquito assessment) which supports that special benefit. Calculated special benefit increases accordingly with an increase in the product of special benefit type and supportive parcel-specific attribute.

The calculation of the special benefit per parcel is summarized in the following equation:

$$\text{Special Benefit}_{(\text{per parcel})} = \sum f(\text{Special Benefits, Property Specific Attributes}^1)_{(\text{per parcel})}$$

1. Such as use, property type, and size.

²⁰ It should be noted that the benefits conferred upon property are related to the average number of people who could potentially live on, work at or otherwise could use a property, not how the property is currently used by the present owner.

Residential Properties

All improved residential properties that represent a single residential dwelling unit are assigned one Single Family Equivalent or 1.0 SFE. Traditional houses, zero-lot line houses, and town homes are included in this category.

Single family residential properties in excess of one acre receive additional benefit relative to a single family home on less than one acre, because the larger parcels provide more area for mosquito sources and District's vector Services. Therefore, such larger parcels receive additional benefits relative to a single family home on less than one acre and are assigned 1.0 SFE for the residential unit and an additional rate of 0.0021 SFE per one-fourth acre of land area in excess of one acre. Mobile home parcels on a separate parcel and in excess of one acre also receive this additional acreage rate.

Other types of properties with residential units, such as agricultural properties, are assigned the residential SFE rates for the dwelling units on the property and are assigned additional SFE benefit units for the agricultural-use land area.

Properties with more than one residential unit are designated as multi-family residential properties. These properties, along with condominiums, benefit from the Services in proportion to the number of dwelling units that occupy each property, the average number of people who reside in each property and the average size of each property in relation to a single family home in the Service Area. This Report analyzed Glenn County population density factors from the 2000 US Census as well as average dwelling unit size for each property type. After determining the Population Density Factor and Square Footage Factor for each property type, an SFE rate is generated for each residential property structure, as indicated in Figure 3 below.

The SFE factor of 0.49 per dwelling unit for multifamily residential properties with 5 or more units applies to such properties up to 20 units. Properties in excess of 20 units typically offer on-site management, monitoring and other control services that tend to offset some of the benefits provided by the Mosquito Abatement District. Therefore the benefit for multifamily properties in excess of 20 units is determined to be 0.49 SFE per unit for the first 20 units and 0.10 SFE per each additional unit in excess of 20 dwelling units.

Figure 3 – Residential Assessment Factors

| | <i>Total</i> | <i>Occupied</i> | <i>Persons per</i> | <i>Pop. Density</i> | <i>SqFt</i> | <i>Proposed</i> |
|-------------------------------------|-------------------|-------------------|--------------------|---------------------|---------------|-----------------|
| | <i>Population</i> | <i>Households</i> | <i>Household</i> | <i>Equivalent</i> | <i>Factor</i> | <i>Rate</i> |
| Single Family Residential | 18,475 | 6,506 | 2.84 | 1.00 | 1.00 | 1.00 |
| Condominium | 598 | 198 | 3.02 | 1.06 | 0.76 | 0.81 |
| Duplex, Triplex, Fourplex | 1,921 | 679 | 2.83 | 1.00 | 0.58 | 0.58 |
| Multi-Family Residential (5+ Units) | 1,642 | 548 | 3.00 | 1.06 | 0.46 | 0.49 |
| Mobile Home on Separate Lot | 3,369 | 1,208 | 2.79 | 0.98 | 0.47 | 0.46 |

Source: 2000 Census, Glenn County, and property dwelling size information from the Glenn County Assessor data and other sources.

Commercial/Industrial Properties

Commercial and industrial properties are generally open and operated for more limited times, relative to residential properties. Therefore, the relative hours of operation can be used as a measure of benefits, since employee density also provides a measure of the relative benefit to property. Since commercial and industrial properties are typically open and occupied by employees approximately one-half the time of residential properties, it is reasonable to assume that commercial land uses receive one-half of the special benefit on a land area basis relative to single family residential property.

The average size of a single family home with 1.0 SFE factor in the Service Area is 0.25 acres. Therefore, a commercial property with 0.25 acres receives one-half the relative benefit, or a 0.50 SFE factor.

The SFE values for various commercial and industrial land uses are further defined by using average employee densities because the special benefit factors described previously are also related to the average number of people who work at commercial/industrial properties.

To determine employee density factors, this Report utilizes the findings from the San Diego County Association of Governments Traffic Generators Study (the “SANDAG Study”) because these findings were approved by the State Legislature which determined the SANDAG Study to be a good representation of the average number of employees per acre of land area for commercial and industrial properties. As determined by the SANDAG Study, the average number of employees per acre for commercial and industrial property is 24. As presented in Figure 4, the SFE factors for other types of businesses are determined relative to their typical employee density in relation to the average of 24 employees per acre of commercial property.

Commercial and industrial properties in excess of 5 acres generally involve uses that are more land intensive relative to building areas and number of employees (lower coverage ratios). As a result, the benefit factors for commercial and industrial property land area in excess of 5 acres is determined to be the SFE rate per fourth acre for the first 5 acres and the relevant SFE rate per each additional acre over 5 acres. Institutional properties that are used for residential, commercial or industrial purposes are also assessed at the appropriate residential, commercial or industrial rate.

Self storage and golf course property benefit factors are similarly based on average usage densities. Figure 4 below lists the benefit assessment factors for such business properties.

Agricultural, Rangeland, and Cemetery Properties

Utilizing research and agricultural employment reports from UC Davis and the California Employment Development Department and other sources, this Report calculated an average usage density of 0.05 people per acre for agriculture property, 0.01 for rangelands and timber and 1.2 for cemeteries. Since these properties typically are a source of mosquitoes and/or are typically closest to other sources of mosquitoes and other vectors, it is reasonable to determine that the benefit to these properties is twice the usage density ratio of commercial and industrial properties. The SFE factors per 0.25 acres of land area are shown in the following Figure 4.

Figure 4 – Commercial/Industrial Benefit Assessment Factors

| <i>Type of Commercial/Industrial Land Use</i> | <i>Average Usage Per Acre ¹</i> | <i>SFE Units per Fraction Acre ²</i> | <i>SFE Units per Acre After 5</i> |
|---|--|---|-----------------------------------|
| Commercial | 24 | 0.500 | 0.50 |
| Office | 68 | 1.420 | 1.42 |
| Shopping Center | 24 | 0.500 | 0.50 |
| Industrial | 24 | 0.500 | 0.50 |
| Self Storage or Parking Lot | 1 | 0.021 | |
| Wineries | 12 | 0.250 | |
| Golf Course | 3.0 | 0.063 | |
| Cemeteries | 1.20 | 0.050 | |
| Agriculture/Vineyard | 0.050 | 0.0021 | |
| Timber/Dry Rangelands | 0.010 | 0.00042 | |

1. Source: San Diego Association of Governments Traffic Generators Study, University of California, Davis and other studies and sources.
2. The SFE factors for commercial and industrial parcels indicated above are applied to each fourth acre of land area or portion thereof. (Therefore, the minimum assessment for any assessable parcel in these categories is the SFE Units listed herein.)

Vacant Properties

The benefit to vacant properties is determined to be proportional to the corresponding benefits for similar type developed properties. However, vacant properties are assessed at a lower rate due to the lack of active benefits, as measured by use by residents, employees, customers and guests. A measure of the benefits accruing to the underlying land is the average value of land in relation to improvements for developed property. An analysis of the assessed valuation data from Glenn County found that approximately 50% of the assessed value of improved properties is classified as land value. Since vacant properties have very low to zero population/use densities until they are developed, a 50% benefit discount is applied to the valuation factor of 0.50 to account for the current low use density and potential for harm or nuisance to the property owner or his residents, employees, customers and guests. The combination of these measures results in a 0.25 factor. It is reasonable to assume, therefore, that approximately 25% of the benefits are related to the underlying land and 75% are related to the day-to-day use of the property. Using this ratio, the SFE factor for vacant parcels is 0.25 per parcel.

Other Properties

Article XIID stipulates that publicly owned properties must be assessed unless those properties are reasonably determined to receive no special benefit from the assessment. All properties that are specially benefited are assessed. Publicly owned property that is used for purposes similar to private residential, commercial, industrial or institutional uses is benefited and assessed at the same rate as such privately owned property. Other public properties such as watershed parcels, parks, open space parcels are determined to, on average, receive similar benefits as a single family home. Therefore such parcels are assessed an SFE benefit factor of 1. Miscellaneous, small and other parcels such as roads, right-of-way parcels, and common areas typically do not generate significant numbers of employees, residents, customers or guests and have limited economic value. These miscellaneous parcels receive minimal benefit from the Services and are assessed an SFE benefit factor of 0.

Church parcels, institutional properties, and property used for educational purposes typically generate employees on a less consistent basis than other non-residential parcels. Many of these properties with higher population factors provide on-site management, monitoring and other control services that tend to offset some of the benefits provided by the Mosquito Abatement District. Therefore, these parcels are determined to, on average; receive similar benefits as a single family home. Therefore such parcels are assessed an SFE benefit factor of 1.

Appeals and Interpretation

Any property owner who feels that the assessment levied on the subject property is in error as a result of incorrect information being used to apply the foregoing method of assessment, may file a written appeal with the Health and Human Services Agency Director or his or her designee. Any such appeal is limited to correction of an assessment during the then current fiscal year or, if before July 1, the upcoming fiscal year. Upon the filing of any such appeal, the Health and Human Services Agency Director or his or her designee will promptly review the appeal and any information provided by the property owner. If the Health and Human Services Agency Director or his or her designee finds that the assessment should be modified, the appropriate changes shall be made to the assessment roll. If any such changes are approved after the assessment roll has been filed with Glenn County for collection, the Health and Human Services Agency Director or his or her designee is authorized to refund to the property owner the amount of any approved reduction. Any dispute over the decision of the Health and Human Services Agency Director, or his or her designee, shall be referred to the Glenn County Board of Supervisors. The decision of the Glenn County Board of Supervisors shall be final.

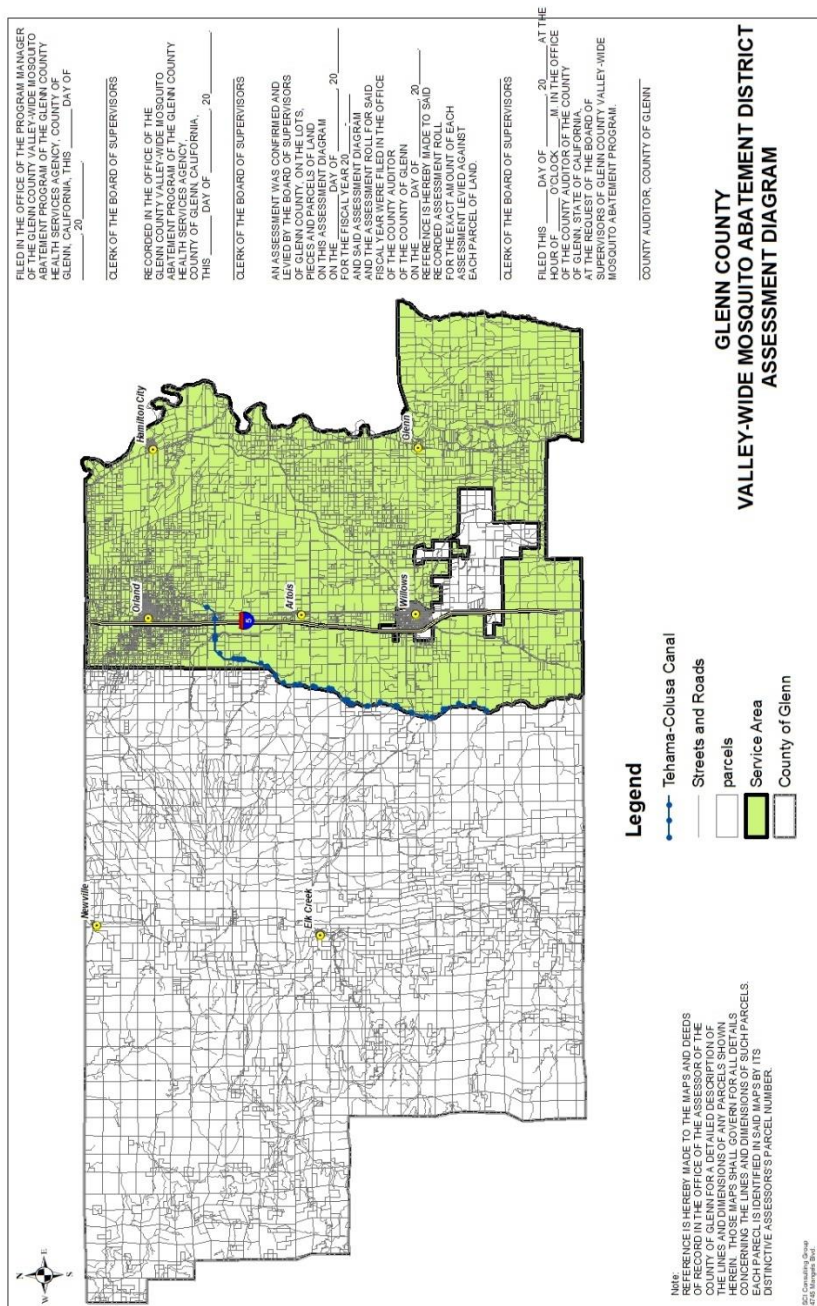
Duration of Assessment

It is proposed that the Assessment be levied for fiscal year 2023-24 and continued every year thereafter, so long as vectors remain in existence and the Glenn County Valley-wide Mosquito Abatement District requires funding from the Assessment for its Services. As noted previously, if the Assessment and the duration of the Assessment are approved by property owners in an assessment ballot proceeding, the Assessment can continue to be levied annually after the Glenn County Board of Supervisors approves an annually updated Engineer's Report, budget for the Assessment, Services to be provided, and other specifics of the Assessment. In addition, the County Board of Supervisors must hold an annual public hearing to continue the Assessment.

Assessment Diagram

The Glenn County Valley-wide Mosquito Abatement District Services Area includes all properties within the boundaries of the Service Area.

The boundaries of the Mosquito and Disease Control Assessment area are displayed on the following Assessment Diagram.



Glenn County Valley-wide Mosquito Abatement District

Mosquito and Disease Control Assessment
Final Engineer's Report, FY 2023-24



Assessment Roll

Reference is hereby made to the Assessment Roll in and for said assessment proceedings on file in the office of the Glenn County Valley-wide Mosquito Abatement District, as said Assessment Roll is too voluminous to be bound with this Report.