



Coachella Valley Mosquito and Vector Control District

Mosquito, Fire Ant and Disease Control Assessment

2020/2021 ENGINEER'S REPORT

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ENGINEER'S REPORT AFFIDAVIT

Mosquito, Fire Ant and Disease Control Assessment

Coachella Valley Mosquito and Vector Control District
Riverside County, State of California

This Report describes the District and relevant zones therein including the improvements, budgets, parcels and assessments to be levied for Fiscal Year 2020/2021, as they existed at the time of the passage of the Resolution of Intention. Reference is hereby made to the Riverside County Assessor's maps for a detailed description of the lines and dimensions of parcels within the District. The undersigned respectfully submits the enclosed Report as directed by the Board of Trustees.

Dated this _____ day of _____ 2020.

Willdan Financial Services
Assessment Engineer
On Behalf of the Coachella Valley Mosquito and Vector Control District

By: _____
Stacey Reynolds, Senior Project Manager
District Administration Services

By: _____
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I. INTRODUCTION

The Coachella Valley Mosquito and Vector Control District (“District”) is a public health agency located in Riverside County which is dedicated to providing vector control and disease surveillance services to the residents and visitors of the Coachella Valley. The District operates its powers under California Health and Safety Code 2000-2093. Its boundaries encompass 2400 square miles which include the cities of Cathedral City, Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Rancho Mirage and Riverside County.

The District is comprised of a unique and diverse geography. The eastern half of the Valley is home to the Salton Sea, a saltwater lake located approximately 227 feet below sea level. The highest elevation of 8,516 feet is recorded at the upper terminal of the Palm Springs Aerial Tramway. The area’s average elevation is 68 feet below sea level. Within these elevations, the District surveys and/or treats residential properties, golf courses, public areas, duck clubs, agricultural areas, as well as the salt marshes surrounding the Salton Sea.

The Board of Supervisors established the District in 1928 primarily for controlling eye gnats, which were creating an epidemic of conjunctivitis (“pink eye”). In 1951, the Board of Trustees added a program for mosquito control, and in 1995, expanded the District to a full, vector control agency. In 2005, the District added the Red Imported Fire Ant program.

The District is governed by an eleven-member Board of Trustees (“Board”), nine from incorporated cities and two from the County-at-large. The Board meets on the second Tuesday of each month at its Indio headquarters. Its services are available to all residents of the Coachella Valley.

As used within this Report, 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(l)).

This Engineer’s Report (“Report”) incorporates and is intended to be consistent with the benefit determinations, assessment apportionment methodology and other provisions established by Resolution 2005-03 and the other documents and reports that established the Assessment. Reference is hereby made to Resolution 2005-03 and other supporting reports.

II. GENERAL DESCRIPTION OF THE PROGRAMS AND SERVICES

The District's purpose and mission is to enhance the quality of life for its community by providing effective and environmentally sound vector control and disease prevention programs through research, development, and public awareness. The services (the "Services") to be funded by the assessment are:

- To fund vector control operations to monitor and control mosquitoes, eye gnats, flies, and other vectors as needed; to suppress the infestation of Red Imported Fire Ants;
- To fund vector surveillance and disease control programs, such as collecting and testing of mosquito pools for viruses, and maintaining sentinel chicken flocks to obtain and test chicken sera samples for arboviruses;
- To protect the community from known vectors and vector-borne diseases by conducting routine control of immature mosquitoes and of adult mosquitoes when needed;
- To support applied research in collaboration with research institutions throughout the country in the application of biological control agents for vectors, such as mosquitofish and tadpole shrimps, to ensure continued improvement of application of IVMP (Integrated Vector Management Program) methods and bio-control measures,
- To protect health using environmentally sound and safe biocontrol programs;
- To fund community outreach programs to educate Valley residents on vector avoidance and on reduction of mosquito breeding sites through elementary school programs, community events, and presentations before civic and community groups;
- To fund related capital improvements and operational services; and
- To fund administrative costs related to the Services or the assessments.

III. ESTIMATE OF COSTS

COACHELLA VALLEY MOSQUITO AND VECTOR CONTROL DISTRICT
Mosquito, Fire Ant and Disease Control Assessment
 Estimate of Cost
 Fiscal Year 2020-2021

	Total Budget
Vector Control Services and Related Expenditures	
Vector Control and Disease Prevention Operations	\$9,653,764.39
Materials, Utilities and Supplies	1,251,256.88
Capital Equipment and Fixed Assets	33,952.00
Total Vector Control Services and Related Expenditures	\$10,938,973.27
Less:	
Contributions from other Sources	(9,209,476.34)
Net Cost of Vector Control, Fixed Asset Equipment, Operation	\$1,729,496.93
Reserve/Contingency Funds ⁽¹⁾	473,481.00
Incidental Costs	
County Collection, Levy Administration, and Other Incidentals	96,832.07
Total Mosquito, Vector & Disease Control Services and Incidentals	\$2,299,810.00
(Net Amount to be Assessed)	

Budget Allocation to Property

Zone	Total SFE Units	Assessment Per SFE	Total Assessment ⁽²⁾
Zone A	159,831.71	\$14.39	\$2,299,502.53
Zone B	42.74	\$7.19	307.47
Total	159,874.45		\$2,299,810.00

¹ Contribution to or from reserve funds

² Variance from budget due to county even penny requirement and rounding

IV. METHOD OF ASSESSMENT

This section of the Report includes an explanation of the benefits to be *derived* from the Services provided by the District, and the methodology used to apportion the total assessment to properties within the Mosquito, Red Imported Fire Ant, and Disease Control Assessment area.

The Mosquito, Red Imported Fire Ant, and Disease Control Assessment area consists of all Assessor Parcels within the District as defined by the State Board of Equalization tax rate areas.

The method used for apportioning the assessment is based upon the proportional special benefits to be derived by the properties in the assessment 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: the first step is to identify the types of special benefit arising from the services, the second step is to estimate the general and special benefits, and the third step is to allocate the assessments to property based on the estimated *relative* special benefit for each type of property.

A. DISCUSSION OF BENEFIT

In summary, the assessments can only be levied based on the special benefit to property. This special benefit is *received* by property *over* and *above* any general benefits from the proposed Services. With reference to the engineering requirements for property related assessments, under Proposition 218 an engineer must determine and prepare a report evaluating the amount of special benefit *received* by property within the District as a result of the improvements or services provided by a local agency. That special benefit is to be determined in relation to the total cost to that local entity of providing the service and/or improvements.

Proposition 218 as described in Article XIIIID of the California Constitution has confirmed that assessments must be based on the special benefit to property:

"No assessment shall be imposed on any parcel which exceeds the reasonable cost of the proportional special benefit conferred on that parcel."

B. BENEFIT FACTORS

In order to allocate the proposed assessments, the Engineer begins by identifying the types of special benefit arising from the aforementioned mosquito and vector control services and that would be provided to property within the assessment area. These types of special benefit are as follows:

- Increased public safety, welfare and protection of health

The proposed assessments will result in expanded and more proactive services to control and abate mosquitoes and other disease carrying or health harming insects. In addition, the proposed assessments will fund additional public health education and disease prevention services. Further, the proposed assessments will fund additional testing and monitoring services for new pathogens that may cause new diseases.

Such expanded services have proven to decrease the likelihood of the transmission of infectious diseases by mosquitoes, such as Encephalitis viruses and other infectious diseases.

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."*¹

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 vector-borne diseases is an essential public service that is vital to public health, safety, and welfare.'*²

Moreover, the Health and Safety Code Sections 2082 et seq. establish that special benefit assessments on real property are a valid method of funding the cost of such vector control programs and services. This constitutes a legislative finding that real property receives special benefit from vector *control* programs and services.

The most important way of introduction of new arboviruses into the Coachella Valley is by the route taken by migratory birds, such as the Pacific Flyway, traveling through the Salton Sea, Sacramento Valley, and tidal marshes near San Francisco all the way to Alaska.

Property in areas with higher disease risk and/or lower public health and safety factors is less desirable and has lower utility and value. Therefore, the proposed Services improve the public health, welfare and safety of residents, employees, customers, tourists, guests, pets, animals and livestock in the Coachella Valley, which is a special or specific benefit ultimately to property in the District.

- Reductions of Potential for New Diseases and Infections in Humans

Mosquitoes have proven to be a major contributor to the spread of new diseases such as West Nile Virus ("WNV"), among others. Mosquitoes can be easily transported and their wide distribution coupled with migratory birds can cause the fast spread of disease transmissions.

*"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 malaria were reported in the USA and dengue transmission has occurred in Texas."*³

According to the CDC.gov website the last reported continental dengue outbreak was in south Texas in 2005 and about 1,500 cases of malaria are diagnosed in the United States each year based on information gather through 2015.

From the time of introduction to United States in 1999, Center for Diseases Control (CDC) has reported 30,702 human cases of West Nile virus, and 1,220 fatalities. In California from the time of introduction 2003 - 2,989 human cases were recorded, with 198 fatalities

*"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."*⁴

(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)

The Services funded by the Assessments will help prevent, on a year-round basis, new diseases and the vectors that transmit diseases. This is an important public health service that ultimately benefits property in the District.

- Enhanced quality of life, desirability of the area and utility of property

The proposed assessments will enhance the control and abatement of mosquitoes, vector populations and other harmful and nuisance insects. This will serve to increase the quality of life and "livability" of property in the Coachella Valley. This enhanced livability and quality of the area will make the area more desirable for residents, customers, guests, tourists and employees. This is a special benefit to residential, commercial, agricultural and industrial properties in the District.

In addition to health related factors, uncontrolled mosquito and vector populations create a nuisance for residents, employees, customers, tourists, farm workers and guests. Properties benefit from the improved environment that is created by the services provided by the Assessment. Agricultural and rangeland properties in the District benefit from the reduced nuisance value and harm to livestock and employees from lower mosquito and vector populations.

Excessive mosquitoes and other vectors in the area can materially diminish the utility and usability of property. For example, prior to the commencement of mosquito control and abatement services, many areas in the State and around the San Francisco Bay were considered to be nearly uninhabitable during the times of year when the mosquito populations were high.⁵ The prevention or reduction of such diminished utility of property caused by mosquitoes is clearly a special benefit to property in the District.

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 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."*⁶

- Increased public awareness and understanding of how to protect themselves, their property and pets and livestock from diseases carried by insects and small mammals.

The proposed assessments will fund public education and awareness programs designed to better protect residents, employees, customers, tourists, guests and their pets and livestock from the risk, harm and nuisance created by vectors and other harmful insects and small mammals. This is a special benefit ultimately to property in the District.

The State Legislature has also made a finding in this regard:

"Public awareness can result in reduced production of mosquitoes and other vectors on private, commercial, and public lands by responsible parties, avoidance of the bites of mosquitoes and other vectors when the risk of West Nile Virus and other disease transmission is high, detection of human cases of mosquito and vector-borne diseases that may otherwise be misdiagnosed for lack of appropriate laboratory testing".⁷

- Protection of economic activity

Outbreaks and other public health threats can have a drastic negative effect on tourism, business and residential activities. The proposed assessments will help to prevent the likelihood of such outbreaks. This is a benefit to business, agriculture and residential properties in the District.

Prior to the commencement of the mosquito and vector control services provided by the District in its current service areas, mosquitoes hindered, annoyed and harmed residents, guests, visitors, farm workers, and business employees to a much greater degree. A vector-borne disease outbreak and other related public health threats would have a drastic negative effect on tourism, business and residential activities in the District.

The economic impact of diseases is well documented. According to a study prepared for the Centers for Disease Control and Prevention, 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. "⁸

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 life spans 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 are 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.⁹

The services to be funded by the proposed assessments will help to prevent the likelihood of such outbreaks in the District and will reduce the nuisance and harm caused by existing

mosquito populations. This is a benefit to the economic activity for business, agriculture and residential properties in the District.

- Protection of the Coachella Valley's tourism, agriculture and business industries

Tourism is a significant component of the economic and business base in the District. The tourism and business industries in the Coachella Valley would benefit from reduced levels of harmful or nuisance mosquitoes and other vectors. Conversely, any outbreaks of emerging vector-borne pathogens such as West Nile Virus could also materially affect these industries.

Diseases transmitted by mosquitoes and other vectors can adversely impact business and recreational functions.

Cases of West Nile Virus disease in horses have been documented, either by virus isolation or by detection of WNV virus-neutralizing antibodies in 1999, 2000, and 2001. Approximately 40% of equine WNV virus cases results in the death of the horse. Horses become infected with WNV virus in the same way humans become infected, by the bite of infectious mosquitoes. In November 2002, a vaccine intended to aid in the prevention of WNV in horses was licensed by the Veterinary Services division of the U.S. Department of Agriculture's Animal and Plant Health Inspection Service.

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 mosquitoes. Per the EPA Public Health Benefits Assessment 1, the Centers for Disease Control (CDC) states that fenthion is needed to counter malathion-resistant mosquitoes in Florida and played a role in the rotation of adulticides for resistance management, and otherwise for control of the very important Aedes spp. salt marsh mosquitoes and Culex nigripalpus.¹¹

The proposed assessments will serve to protect the tourists, employees and other businesses and residents that benefit from these industries. This is ultimately a special benefit to property in the District.

- Wildlife Protection

In addition to domesticated animals, uncontrolled mosquitoes and vectors are a significant risk to wildlife and local ecosystems. Bird populations are especially vulnerable to mosquito-borne diseases, as are wild mammals such as bats, chipmunks and raccoons.

"The spread of the virus by birds and mosquitoes has significant implications for animal health as well. Animal health officials are concerned about the potential effects on wildlife and other animals, particularly those birds that are susceptible to fatal illness from the virus. The evidence currently points to a mosquito-bird cycle being primarily responsible for the spread of WNV. The WNV vector is the same mosquito vector as St. Louis Encephalitis, Culex tarsalis and Culex quinquefasciatus. Because of this bird-mosquito cycle, numerous species of birds are at risk and have died from WNV."¹²

Properties in areas with reduced wildlife inherently become somewhat less desirable. Although this may be a somewhat less significant factor, the cumulative benefit from all

benefit factors must be evaluated in context of the small proposed assessment. It is reasonable to conclude that the cumulative benefit exceeds the proposed assessment.

- Reduced risk of nuisance and liability

Agricultural, range, golf course, cemetery, open space, marsh lands, and other such lands contain large areas of mosquito and vector habitat and are therefore a significant source of mosquito and vector populations in the District's area of service. In addition, residential and business properties can also contain significant sources. It is conceivable that known 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 homeowners who don't remove standing water sources of mosquitoes on their property.

The proposed Services to be provided by the District will reduce the mosquito and vector related nuisance and health liability to properties in the District. Moreover, emerging vector-borne pathogens such as the West Nile Virus are a significant threat to horses. The reduction of that risk of liability constitutes a special benefit to property in the District, in addition to the benefits conferred due to the reduced impact of mosquito and vector populations on residents, employees, customers, tourists, guests and livestock, pets, and wildlife.

The above benefit factors, when applied to property in the District, confer special benefits to property and create specific enhancement of property values because properties are more desirable, usable and valuable in areas with improved public health, welfare, safety, quality of life and environment and reduced nuisance factors. These are special benefits to each parcel of property in much the same way that storm drainage, sewer service, water service, sidewalks and paved streets enhance the utility and attractiveness of each parcel of property providing them with more utility of use and making them safer, easier to market, and, ultimately, more valuable.

It should also be noted that Proposition 218 contained a specific exemption for existing vector assessments and other "traditional" assessments for sidewalks, streets, sewers, water, flood control and drainage systems from the new balloting approval procedures it established. In the Statement of Drafter's Intent, the Howard Jarvis Taxpayers Association (HJTA), the authors of Proposition 218, further confirmed that vector assessments were an acknowledged and "traditional" use of assessments. Therefore they granted existing vector assessments an exemption from the new balloting requirements. Furthermore, the HJTA acknowledged that new vector assessments would be subject to the Proposition 218 balloting requirements. This acknowledgement indicates that the HJTA recognized vector control services as a "traditional" use of assessments, that they acknowledged that new vector assessments may be formed after Proposition 218 and inherently, therefore, that vector control services confer special benefit to properties.¹³

In summary, the direct special benefits described in this Report ultimately enhance the economic values of all benefiting real properties in excess of the proposed assessments for these properties. In other words, the assessment engineer finds that the cumulative benefits to property from the Services are reasonably equal to or greater than the annual proposed assessment amount per home and benefit unit.

C. GENERAL VERSUS SPECIAL BENEFIT

As previously discussed, the proposed assessments will fund comprehensive, year-round mosquito, other vector control and disease surveillance and control services that will clearly confer special benefits to the underlying properties in the Coachella Valley. These benefits are expressed to the underlying property by the property owners, guests, employees and tenants who will enjoy a more habitable, safer and more desirable place to live, work or visit.

While the District is the principal vector control agency in the Coachella Valley that controls the spread of mosquito-borne disease as well as mosquito populations, the District does provide a degree of general benefit to the public at large. A measure of this benefit is the proportion of its services that affect those who are not residents, employees, customers, or property owners in the Coachella Valley. Each year, the District provides some of its services in areas near the boundaries of Riverside County, specifically in areas bordering Imperial County, as well as areas bordering the District's westerly boundaries, west of Palm Springs. By abating mosquito populations near the borders of Riverside County and near the borders of the District on the West and East sides, the Services could provide benefits in the form of reduced mosquito and vector populations and reduced risk of disease transmission to properties outside the District. The District conservatively estimates that less than 5% of its operating budget is allocated towards providing services that may, in part, benefit surrounding areas not within the Coachella Valley. Although it can be argued that services near the County and District boundaries are offset by similar offsetting benefits to property in the District from services received in most of the other adjoining Counties, we use the full percentage because it is a more conservative measure.

Another component of general benefit is to those people who visit the Coachella Valley but do not live, shop or work within the proposed assessment area. It has been conservatively estimated that fewer than 5% of the people who visit the Coachella Valley do not live, shop or work within the District. Therefore, 5% of potential benefits to the greater public that visit the District but do not live, work or shop there is another measure of the general benefits from the Mosquito, Red Imported Fire Ant, and Disease Control Assessment.

Using an average of these two measures of general benefit, we find that a maximum of 5% of the benefits conferred by the proposed Mosquito, Fire Ant and Disease Control Assessment are determined to be general in nature. Therefore, 5% of the benefits conferred by the proposed services and improvements are general in nature and must be funded by sources other than the assessment.

The proposed mosquito, fire ant and disease control assessment total budget for mosquito and vector abatement, disease control, and capital improvement is \$11,035,805. Of this total budget amount, the District will contribute about \$8,735,995 or approximately 79% of the total budget from sources other than the Mosquito, Red Imported Fire Ant, and Disease Control assessment. This contribution offsets any general benefits from the Mosquito, Red Imported Fire Ant, and Disease Control Assessment Services.

D. METHOD OF ASSESSMENT

The third step in apportioning assessments is to determine the relative special benefit for each property. This process involves determining the relative benefit received by each

property in relation to a single family home, or, in other words, on the basis of Single Family Equivalent ("SFE"). This SFE methodology is commonly used to distribute assessments in proportion to estimated special benefit and is generally recognized as providing the basis for a fair and appropriate distribution of assessments. For the purposes of this Engineer's Report, all properties are designated a SFE value, which is each property's relative benefit in relation to a single family home on an average sized residential parcel. The "benchmark" property is the single family detached dwelling which is one (1) Single Family Equivalent or one (1) SFE.

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. An assessment primarily for the properties with sources of mosquitoes was considered but deemed inappropriate because these properties often have limited economic value and usage by people and because mosquitoes typically fly from their source breeding locations to places occupied by people and animals. Furthermore, even urban residential properties can and do generate their own, often significant, populations of mosquito and vector organisms.

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 would benefit from reduced mosquito and vector 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.

Therefore, the Engineer determined that the appropriate method of assessment should be based on the type and potential use of property, the relative size of the property and its location. This method is further described below.

E. ZONES OF BENEFIT

The District's mosquito, fire ant, and disease control programs, projects and services that will be funded by the proposed Mosquito, Fire Ant and Disease Control Assessment will be provided in all areas within the District boundaries. However, areas north of the Colorado River Aqueduct, which are areas occupied by the Joshua Tree National Park, the Pinto Mountains and the southern ridge of the Twenty nine Palms Mountains, are more remotely located and receive a reduced level of Services and corresponding benefits relative to other parcels in the District. These areas are hereinafter referred to as Zone of Benefit B or Zone B and are depicted on the Assessment Diagram included with this Report. All other parcels within the District boundaries are within Zone A.

Using District estimates for the amount of Services provided to parcels north of the Colorado River Aqueduct (Zone B) relative to the level of Services in Zone A, we find that parcels in Zone B receive approximately one-half of the average level of Services and benefits provided to other parcels in the District (Zone A). Therefore, parcels in Zone B receive 50% of the assessment rate per benefit unit.

F. ASSESSMENT APPORTIONMENT

The special benefits derived from the Mosquito, Fire Ant 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 District 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 District. 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.

RESIDENTIAL PROPERTIES

All improved residential properties that represent a single residential dwelling unit are assigned one Single Family Equivalent ("SFE") 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 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 0.002 SFE per one-fifth 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 and improvements 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 Riverside County. This Report analyzed Riverside 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 0.36 per dwelling unit for multifamily residential properties applies to such properties with two to four units (duplex, triplex, fourplex). Properties in excess of 5

units typically offer on-site management, monitoring and other control services that tend to offset some of the benefits provided by the mosquito and vector control district. Therefore, the benefit for properties in excess of 5 units is determined to be 0.25 SFE per unit for the first 20 units and 0.10 SFE per each additional unit in excess of 20 dwelling units.

Figure 3 - Riverside County Residential Assessment Factors

	Total Population	Occupied Households	Persons per Household	Population Density Equivalent	Sqft. Factor	SFE Rate
Single Family Residential	1,068,257	327,073	3.27	1.00	1.00	1.00
Condominium	73,926	28,805	2.57	0.79	0.70	0.55
Duplex, Triplex, Fourplex	74,640	25,789	2.89	0.89	0.40	0.36
Multi-Family Residential, 5+ Units	146,765	62,396	2.35	0.72	0.34	0.25
Mobile Home on Separate Lot	144,064	60,164	2.39	0.73	0.36	0.26

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

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 Riverside County is 0.20 acres. Therefore, a commercial property with 0.20 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 fifth 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, winery 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 properties. The SFE factors per 0.20 acres of land area are shown in the following Figure 4.

Figure 4 - Commercial/Industrial Benefit Assessment Factors

Type of Commercial/Industrial Land Use	Average Usage Per Acre ¹	SFE Units per Fraction Acre ²
Commercial	24	0.500
Office	68	1.420
Shopping Center	24	0.500
Industrial	24	0.500
Self-Storage or Parking Lot	1	0.021
Wineries	12	0.250
Golf Course	3	0.063
Cemeteries	1.200	0.050
Agricultural/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 fifth 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 the County of Riverside found that 25% 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 0.25 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 0.125 factor. It is reasonable to assume, therefore, that approximately 12.5% of the benefits are related to the underlying land and 87.5% are related to the day-to-day use of the property. Using this ratio, the SFE factor for vacant parcels is 0.125 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. 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 General Manager of the Coachella Valley Mosquito and Vector Control District 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 District's General Manager or his or her designee will promptly review the appeal and any information provided by the property owner. If the District's General Manager 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 the Riverside County for collection, the District's General Manager 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 District's General Manager, or his or her designee, shall be referred to the Board of Trustees. The decision of the Board shall be final.

G. ASSESSMENT RANGE FORMULA

The assessment is subject to an annual adjustment tied to the Consumer Price Index for the Los Angeles – Orange - Riverside Area as of December of each succeeding year (the "CPI"), with a maximum annual adjustment not to exceed 3%. The assessment rate per single family equivalent benefit unit for the Mosquito, Fire Ant and Disease Control Assessment may increase in future years by an amount equal to the annual change in the CPI, not to exceed 3% per year. In the event that the annual change in the CPI exceeds 3%, any percentage change in excess of 3% can be cumulatively reserved and can be added to the annual change in the CPI for years in which the CPI change is less than 3%. Beginning Fiscal Year 2020/2021, the Los Angeles – Orange – Riverside Area CPI is no longer available; therefore, the annual adjustment will be based on the current Riverside-San Bernardino-Ontario Area CPI since it is the most applicable to this district.

The annual CPI change for the Riverside-San Bernardino-Ontario Area from January 2019 to January 2020 is 3.03%. The maximum authorized assessment rate for Zone A for fiscal year 2020/2021 is \$23.44 per single family equivalent benefit unit. The proposed fiscal year 2020/2021 assessment rate per single family equivalent benefit unit for the Mosquito, Fire Ant and Disease Control Assessment is \$14.39 which is less than the maximum allowable rate. The maximum assessment rate for Zone B for fiscal year 2020/2021 is \$11.72 and the proposed rate for this zone is \$7.19.

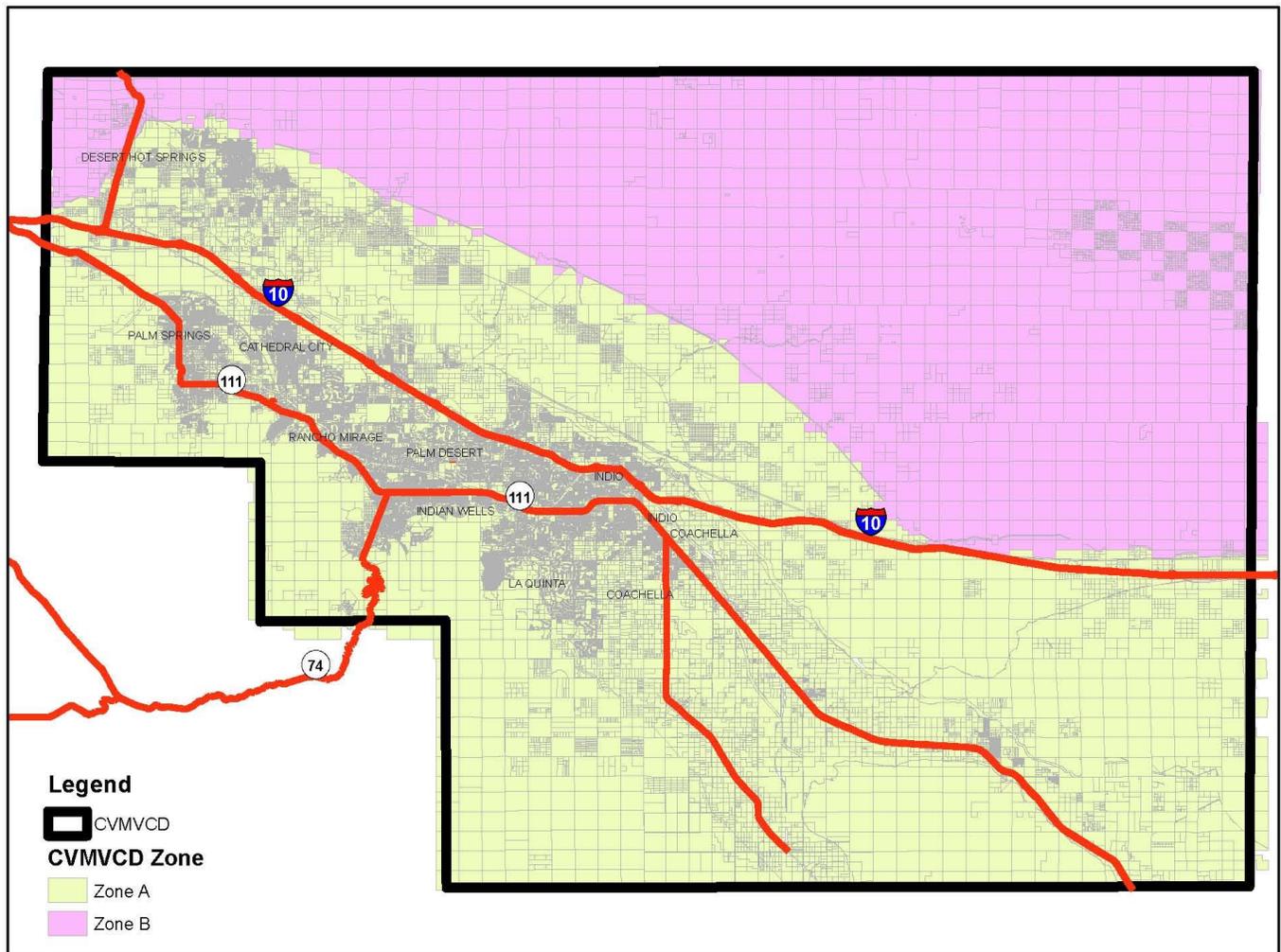
Since property owners, in the assessment ballot proceeding conducted in 2005, approved the initial assessment including the CPI adjustment schedule, the assessment may be levied annually and may be adjusted by up to the maximum annual CPI adjustment without any additional assessment ballot proceeding.

V. ASSESSMENT DIAGRAM

The proposed Mosquito, Fire Ant and Disease Control Assessment area includes all properties within the boundaries of the Coachella Valley Mosquito and Vector Control District.

The boundaries of the Mosquito, Fire Ant and Disease Control Assessment area are displayed on the following diagram.

CVMVCD



VI. END NOTES

1. Assembly Concurrent Resolution 52, chaptered April 1, 2003
2. As an example of how travel can introduce new vectors and diseases, health officials think that the first human case of West Nile Virus in California (in 2002) was from a mosquito that was transported by car or plane from another state with proven West Nile Virus activity.
3. Rose, Robert. (2001). Pesticides and Public Health: Integrated Methods of Mosquito Management. Emerging Infectious Diseases. Vol. 7(1); 17-23.
4. Center for Disease Control. (2004). West Nile Virus Activity --- United States, November 9--16, 2004. Morbidity and Mortality Weekly Report. 53(45); 1071-1072.
5. Prior to the commencement of modern mosquito control services, areas in the State of California such as the San Mateo Peninsula, Napa County and areas in Marin and Sonoma Counties had such high mosquito 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 mosquito populations were lower.
6. Assembly Concurrent Resolution 52, chaptered April 1, 2003
7. Ibid
8. 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/voll0nol0/03-0925.htm>
9. 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
10. 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/cnahs/nahms/equine/wnv2002_CO_NB.pdf
11. Jennings, Allen. (2001). USDA Letter to EPA on Fenthion IRED. United States Department of Agriculture, Office of Pest Management Policy. March 8, 2001.
12. U.S. Government Accounting Office (GAO), "West Nile Virus Outbreak: Lessons for Public Health Preparedness." GAO Report Number GAO/HEHS-00-180, September, 2000. Page 17.
13. "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." Howard Jarvis Taxpayers Association, "Statement of Drafter's Intent", January 1997.

VII. ASSESSMENT ROLL

Reference is hereby made to the Fiscal Year 2020/2021 Assessment Roll in and for said assessment proceedings on file in the office of the General Manager of the District, as said Assessment Roll is too voluminous to be bound with this Engineer's Report.