

The 81st and 82nd Report for the Alameda County Mosquito Abatement District

2012-2013



New mosquitoes make their way into the Bay Area
bringing the potential for new diseases



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Dedicated to the Memory of

James Kohnen
Board Member 2004-2012
Died May 29, 2012



TABLE OF CONTENTS

Governing Board.....	1
District Personnel.....	3
Operational Data.....	4
Operations Report.....	5
Entomologist's Report.....	9
Invasive Species.....	12
Public Outreach.....	14
Regulatory Update.....	16
District Manager Retires.....	19
Financial Report.....	21
Combined Balance Sheet.....	22

GOVERNING BOARD

The Alameda County Board of Supervisors and each of the elected councils of the 13 cities within the District appoint one trustee to represent its constituency on the governing board of the Alameda County Mosquito Abatement District. The Board of Trustees consists of individuals dedicated to community service and willing to accrue the knowledge required to effectively govern a mosquito abatement district. The current board members possess a variety of skills and expertise in business, government, civil engineering, electrical engineering, general contracting, automotive mechanics, agriculture, genetics, medicine, medical entomology, environmental health, scientific research, physics, public health and sanitary engineering.

The diversity of knowledge possessed by the trustees provides a broad, conceptual framework within which the Board decision-making occurs. In these ever-changing times, the knowledge base provided by the trustees is an invaluable resource.

The trustees serve two-year terms without compensation; however, they do receive allowances for expenses incurred in attending business meetings of the Board. The regular Board meetings are held on the second Wednesday of each month at the District office, 23187 Connecticut Street, Hayward at 5:00 p.m. and the meetings are open to the public.

Trustees for the years 2012 & 2013

Trustee	Representing	Years of Service
Elizabeth Anders	Oakland	.5
Dennis Bray	County-at-large	10
Edgar I. Centeno	Pleasanton (2012)	11
Ryan Clausnitzer	Alameda (2013)	1
James N. Doggett	Livermore	36
T. David Edwards	Alameda (2012)	25
Jim Golden	Emeryville	18
Richard Guarienti	Dublin (2013)	1
Abe Gupta	Dublin (2012)	.5
Barbara Halliday	Hayward	3
John D. Hughes	Fremont (2012)	28
Denny A. McLeod	Piedmont	14
Kathy Narum	Pleasanton (2013)	1
James Prola	San Leandro	6
Ronald E. Quinn	Union City	12
William Spinola	Newark	31

Trustees for the years 2012 & 2013 (continued)

Trustee	Representing	Years of Service
Jan O. Washburn	Berkeley	20
George Young	Fremont (2013)	1

Board Committees

In order to adequately address issues which may require more time than can be reasonably devoted during a board meeting, several committees have been formed. Trustees volunteer extra time as a part of their participation in a board committee.

Finance/Capital Planning Committee

Considers the District's long term capital needs and makes recommendations for designating reserves for the District's future capital replacement.

Members: Ryan Clausnitzer, Jim Golden, Denny McLeod, Ronald Quinn, and George Young

Policy Committee

Evaluates the District's internal control policies, oversees the preparation of an internal control manual, and reviews other policies as needed.

Members: Ryan Clausintzer, James Doggett, Richard Guarienti, and Denny McLeod

Energy and Environmental Conservation Committee

Evaluates potential energy and environmental conservation measures currently in use, and suggests further measures.

Members: Elizabeth Anders, James Doggett, Barbara Halliday, Ronald Quinn, and William Spinola

DISTRICT PERSONNEL

Name of Employee	Position	Years of Service
Dereje Alemayehu	Vector Biologist (Zone 3 & 4)	14
John Busam	Vector Biologist (Zones 9 & 10)	11
Lyle Cain	Vector Biologist (Zones 5 & 7)	13
Cornelius Campbell	Vector Biologist (Zone 8)	10
Miguel Cardenas	Mosquito Control Technician (Zone 2)	1
Erika Castillo	Environmental Specialist	11
Joseph Huston	Field Operations Supervisor	22
Michelle Izumizaki	Mosquito Control Technician (Zone 1)	5
Bruce Kirkpatrick	Entomologist	15
Clarence Lam	Administrative/Financial Manager	11
Gregory Leipzig	Vector Biologist (Zone 6)	7
Sharon Mead	Systems Specialist	27
Chindi Peavey	Manager	1
John Rusmisel	Manager (retired in 2012)	32
Gregory Wood	Mechanical Specialist	14

Seasonal Employees

2012

Nick Appice
Jacob Ferdan
Weston Pokorny

2013

Nick Appice
Jacob Ferdan
Kevin Huffstutler



OPERATIONAL DATA 2009 - 2013

	2009	2010	2011	2012	2013
Physical control operations					
Maintenance of ditches (lineal feet)	8082	9229	8515	15440	0
Mosquitofish operations					
Total number of sites stocked with <i>Gambusia</i>	1023	864	787	792	761
Total number of fish planted	20685	19,122	17,118	15,663	15,986
Chemical control operations					
Scourge adulticide (resmethrin) (ounces)	0	11	0	0	0
Pyrenone 25-5 adulticide (oz)	0	0	7	0	2
Skeeter Abate granules (pounds)	0	0	44	0	0
Surface Agents					
Golden Bear 1111 larvicidal oil (gallons)	1190	1898	111	3.4	0
BVA2 larvicidal oil (gallons)	N/A	47	1255	876	1937
Agnique MMF monomolecular film (oz)	35	20	0.6	1.5	0
Biorational larvicides					
Bacteria based					
<i>Bacillus thuringiensis israelensis</i>					
Vectobac 12AS liquid concentrate (gallons)	70	122	100	40	54
Vectobac G granular (pounds)	3964	5500	4496	2874	2741
<i>Bacillus sphaericus</i>					
Vectolex CG (pounds)	2796	2994	3375	1005	1094
Vectolex WSP (pounds)	105	81	57	23	16
Vectolex WDG (pounds)	248	251	194	41	54
FourStar 180 day Briquets (pounds)	N/A	51	188	29	93
<i>Bacillus thuringiensis israelensis</i> and <i>Bacillus sphaericus</i>					
Vectomax CG (pounds)	2	271	181	31	0
<i>Spinosad</i>					
Natular XRT (pounds)	N/A	16	531	491	153
Natular G30 (pounds)	N/A	0	75	150	916
Insect growth regulator (methoprene)					
Altosid Liquid Larvicide 20% (ounces)	600	825	683	222	311
Altosid Briquets (each)	5141	3424	1684	1478	1903
Altosid XR Briquets (each)	3974	3381	611	1042	247
Altosid Pellets (ounces)	4208	3803	3150	6687	3094
Altosid WSP (ounces)	10	22	0	178	0
Altosid XR-G (ounces)	1544	432	0	0	0
Total hours of District effort					
Physical control	337	490	336	549	139
Mosquitofish plants	555	454	438	468	417
Biorational control	2127	2282	1888	1114	1139
Chemical control	438	418	276	277	553
Monitoring and surveillance	7610	9976	7579	7037	7357
Public Relations	1651	1574	1371	1317	853
Equipment and facilities maintenance	1972	1849	2058	2234	2026
Administration, training and safety	12121	12482	13206	13928	14033

OPERATIONS REPORT

Material Usage

The drought conditions of the past several years have led to some shifts in the breeding patterns of many of the mosquito species found in Alameda County. That being said, a dedication to, and emphasis on a larval control program that primarily utilizes biorational materials has remained a priority for the District.

Figure 1 shows the percent of acres treated with each of the types of materials utilized by the District. In over 99% of the area treated, control was directed at the larval stage. Biorational materials (bacteria-based or insect growth regulators) were used in 78% of the area treated.

Percent of Acres Treated by Pesticide Types 2012-2013

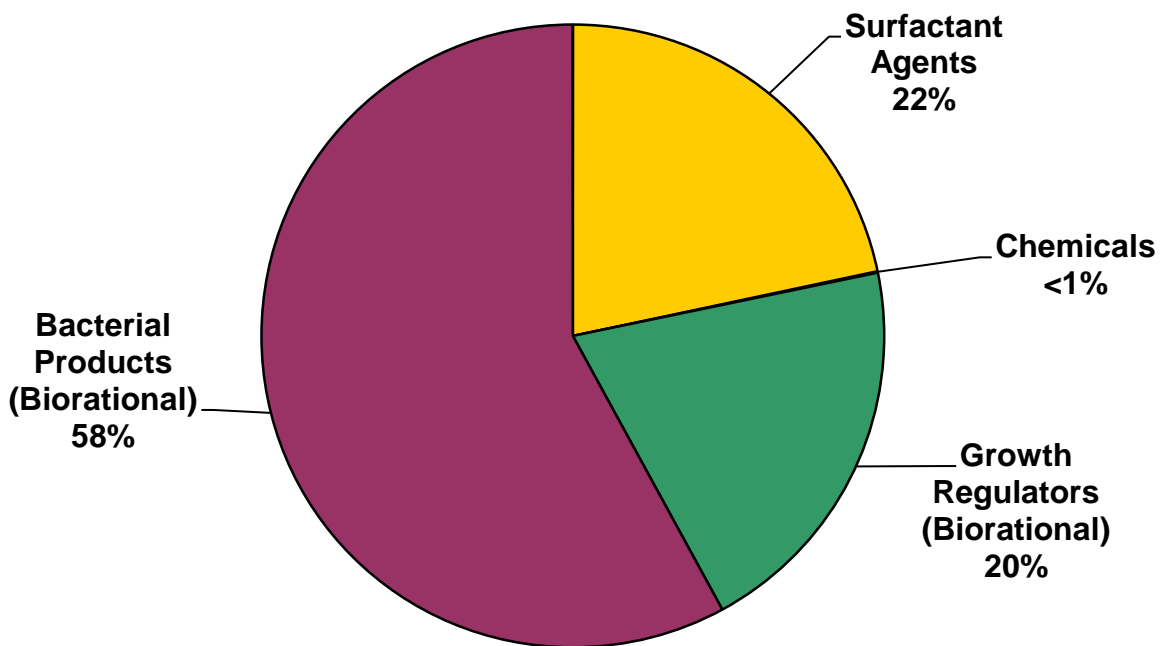


Figure 1

Physical Control Operations

In 2012 physical control measures, primarily the maintenance of ditches with hand tools in the county's tidal salt marshes, were at a 7-year high. During this year district staff spent 549 hours and cleaned over 15,440 linear feet of ditches. This was almost twice the amount of work done in 2011 (336 hours, 8,515 linear feet) (see page 4). Ditches allow the tidal water to move in and out of the marsh systems and greatly reduce the habitat available for *Aedes dorsalis*, the summer salt marsh mosquito. *Aedes dorsalis* is

an aggressive mosquito that travels to nearby residential neighborhoods and bites during the day. Adult mosquitoes are capable of generating many calls from the public. The District conducts ditching under a permit held by the California Department of Public Health with the Army Corps of Engineers, the Bay Conservation and Development Commission, and the San Francisco Bay Regional Water Quality Control Board. Efforts to renew the permit in 2012 and 2013 encountered a number of delays due to the need to meet increasingly stringent requirements for working in tidal salt marshes. An environmental consulting firm was hired in 2013 to conduct an environmental assessment and efforts to renew the permit are continuing. For this reason, no ditching could be conducted in 2013. Maintenance of tidal recirculation ditches decreases the resources required to control the summer salt marsh mosquito, so the lack of a permit is of great concern to District staff.

Service Requests

Of the five types of service requests received by the District (Figure 2), over half are requests for delivery of mosquito fish (*Gambusia affinis*) to backyard ponds, neglected swimming pools, and horse troughs. Mosquito fish delivery is an integral part of the District's services. This is followed in volume by requests to "Prevent Mosquitoes." These are calls from the public to report neglected swimming pools, standing water in street gutters or any standing water where mosquito development may occur.

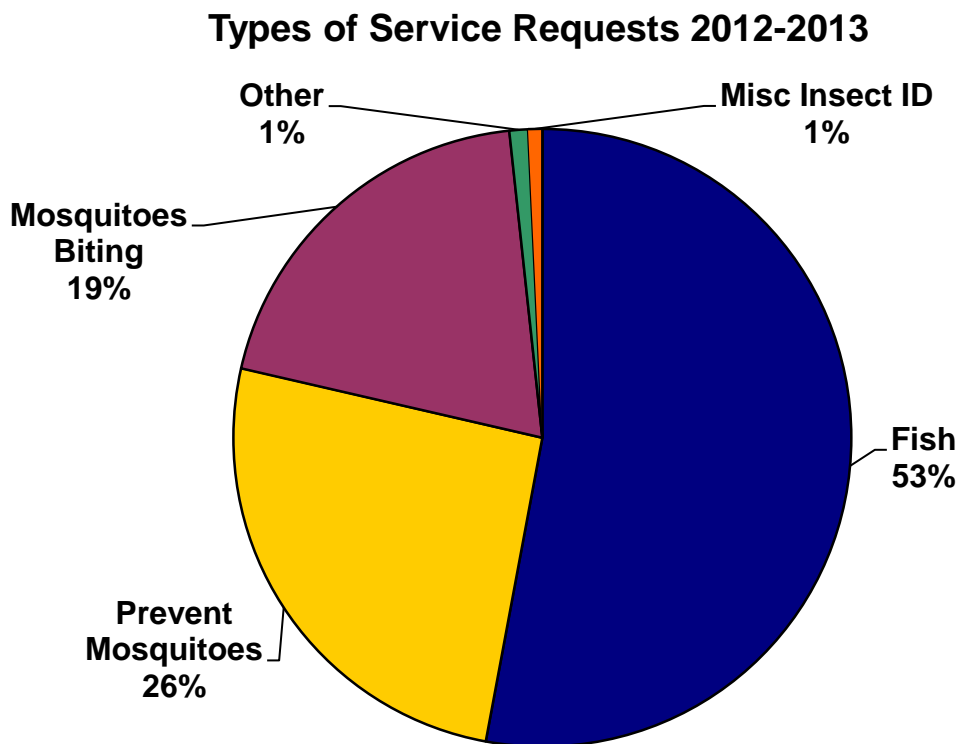


Figure 2

Figure 3 shows the proportion of service requests attributed to residents of different cities for 2012 and 2013. Figure 4 illustrates the number and type of service requests for each city during this period.

Service Requests for Cities 2012-2013

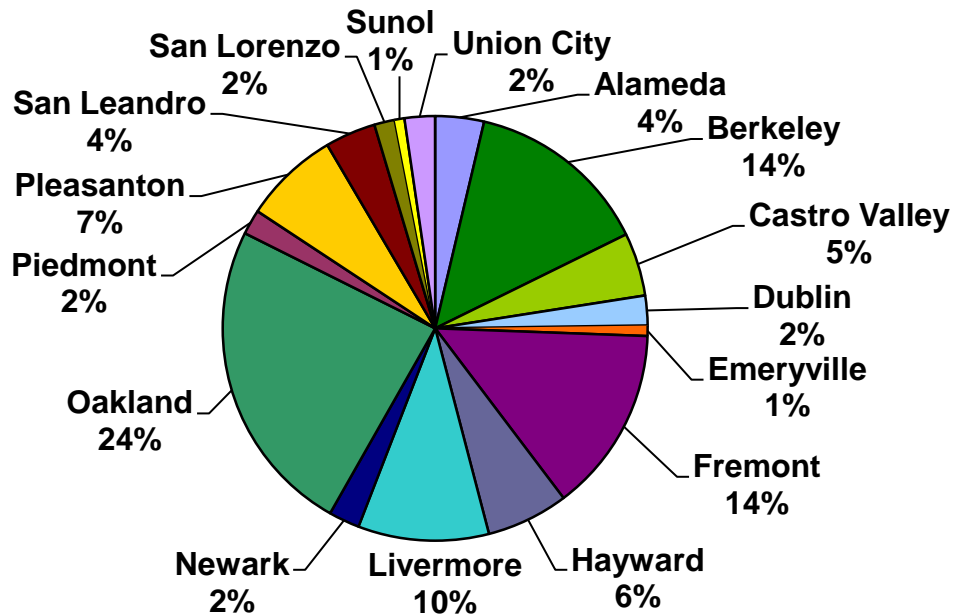


Figure 3

Number and Type of Service Requests by City 2012-2013

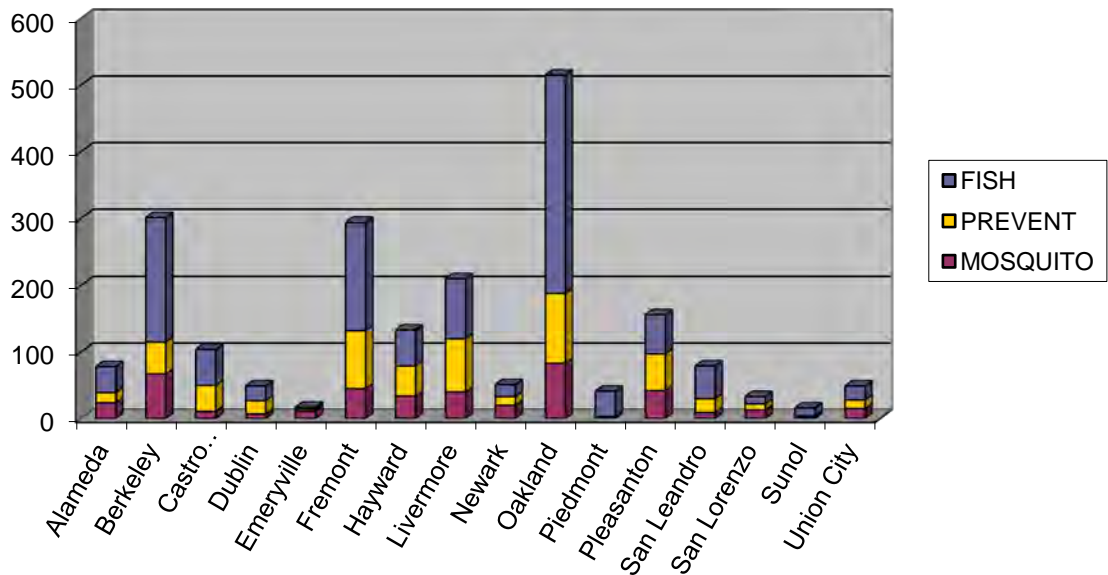


Figure 4

The larger and more densely populated cities of Oakland, Fremont, Berkeley and Livermore make up 62% of calls to the District for service (Figure 3). As the population of Alameda County grows, we have seen and anticipate we will continue to see, an increase in requests for service. For example, the population of the Tri-Valley area of the county (Livermore, Pleasanton, and Dublin) has nearly doubled since 1980.

Swimming Pools

For many years the District has hired a private pilot to survey and photograph neglected pools. It is a very successful program and has been adopted by many districts throughout the state. Unmaintained pools can produce tens of thousands of mosquitoes. Of primary concern is the species *Culex tarsalis* which is an important vector of West Nile Virus. The first aerial survey was done in 2006 and included most of Alameda County. Between 2008 and 2012, Livermore, Pleasanton and Dublin were surveyed. These areas have the largest concentration of neglected pools. In 2013, the District expanded its fly-over program to the cities of Fremont, Newark, and Union City. Numerous new sites were identified in these areas. Field staff inspected over 550 potentially breeding swimming pools in 2013, nearly twice the number found in 2012 (Figure 5).

Swimming Pools Inspected as a Result of Aerial Survey

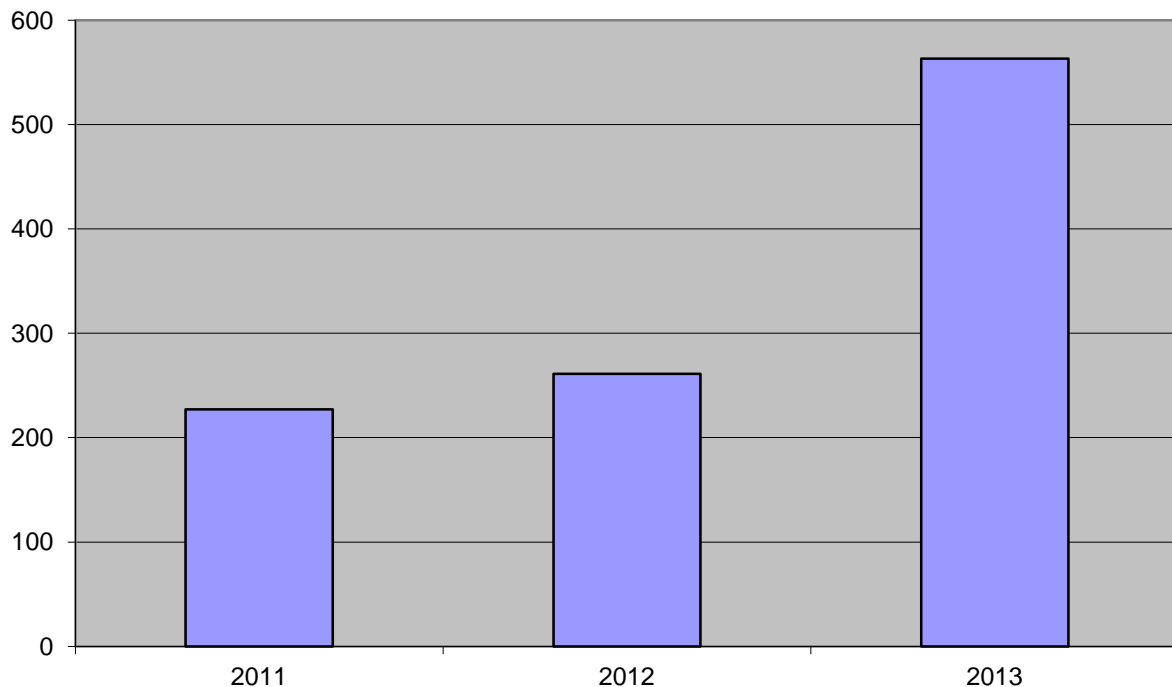


Figure 5

ENTOMOLOGIST'S REPORT

Climate

Reviewing mosquito abundance is best done in the context of climate. At the time of this writing, California is experiencing its third consecutive drought year. The rainy season from 10/1/11 through 5/1/12 produced 10.95 inches at the Hayward Airport, compared with the 10 year average of 15.87 inches (69% of average). The following season from 10/1/12 through 5/1/13 saw 7.01 inches of rain, compared with a 10 year average of 14.44 inches (only 49% of the average). Lower rainfall totals typically result in fewer total mosquitoes but there can also be other impacts on the seasonal timing of certain species. It is well understood that less rain results in fewer flooding events for the County's floodwater *Aedes* species, less accumulation of water in marshy areas for species such as *Culex tarsalis*, *Culex erythrothorax*, and *Culiseta inornata*, and a reduction in backyard sources for species such as *Culiseta incidens*. However, lower rainfall years can change the timing of when species may occur. During a normal rainfall season, creeks and canals may experience "pockets" of breeding along boundaries as water flow diminishes during mid to late summer, and the arroyos in the Livermore and Pleasanton area typically breeding *Anopheles* species in the late spring and early summer. Seasons with below average or sporadic rainfall may produce mosquitoes year round at these types of sources. In addition, *Culex pipiens*, the Northern House Mosquito, is known to thrive during drought conditions. This species is typically found in underground storm lines that are "flushed out" during our normal heavy rain events. Without these events, this species is active well beyond its normal summer season.

Adult Mosquito Surveillance

Table 1 summarizes a history of the District's CO₂ (carbon dioxide) mosquito trapping totals over the last nine seasons. The years 2005, 2006, and 2011 produced exceptionally high numbers of mosquitoes primarily because of the flooded conditions at the Coyote Hills Regional Park. After 2006, restoration work was done that improved the water flow through the park, reducing mosquito habitat. During the 2011 season, another project along the levee road bordering the park created temporarily high water levels that increased mosquito production. The years 2007, 2008, 2009, 2010, 2012, and 2013 more closely represent accurate county-wide mosquito populations. With greater resources and efficiency, the District has been able to increase the number of trap placements since creation of this program. A "trap placement" is considered a single night's placement of a CO₂ trap at a regular surveillance location. The District has over 125 of these locations that are typically monitored from May 1st through October. Despite the increase in trap placements in 2012 and 2013, fewer total mosquitoes were collected than previous years. This is presumably due (in part) to significantly reduced rainfall during this time. Another interesting pattern can be seen in

the number of trap placements that have resulted in no mosquitoes collected. During the drier years, approximately one out of five traps placed resulted in no mosquitoes collected, compared with one out of 10 trap placements during previous seasons.

Table 1. CO₂ Trap History Summaries

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total mosquitoes	43,087	38,916	16,190	13,306	22,046	23,083	51,920	11,410	10,864
Trap sites	747	687	763	594	899	857	1091	1314	912
Avg. mosquitoes caught/trap site	57.7	56.6	21.2	22.4	24.5	26.9	47.6	8.7	11.9
Traps with no mosquitoes					85 (9%)	74 (9%)	146 (13%)	274 (21%)	178 (20%)

Mosquitoes Without Borders

A common and faulty assumption in the mosquito control business is that if your District is excelling in its control efforts, there will be no biting complaints, few mosquitoes, and all will run smoothly. Unfortunately this is not always the case. During the summer of 2012, along the County’s southern border with Santa Clara, there were a series of “fly offs.” Initially, the District received requests for service regarding aggressive daytime biting mosquitoes. Collected samples and trap results indicated that *Aedes dorsalis* were the culprit. Then two weeks later, towards the end of August, *Aedes squamiger* also appeared in those CO₂ traps. This species, the “Winter Salt Marsh Mosquito,” normally occurs in the spring months following winter rains, and by June, is no longer found. Its appearance in August is a complete anomaly and has never been seen during this time of year by any of the seasoned District staff. Subsequent conversations with Santa Clara County Mosquito and Vector Control personnel revealed that the United States Fish and Wildlife Service had initiated a project that flooded previously dry marsh land, all within a few minutes of the County border. During this time, our District had greatly increased CO₂ trapping near the county line. It turns out that other species, especially *Culex pipiens*, were being collected in alarmingly high numbers. This caused great concern among District staff, as West Nile Virus positive mosquitoes were collected just south of the border, and West Nile Virus positive birds were being collected by our staff just north of the border. Apparently, sewer ponds on the Santa Clara county side were responsible. These types of fly offs are an important reminder that mosquitoes do not respect county lines.

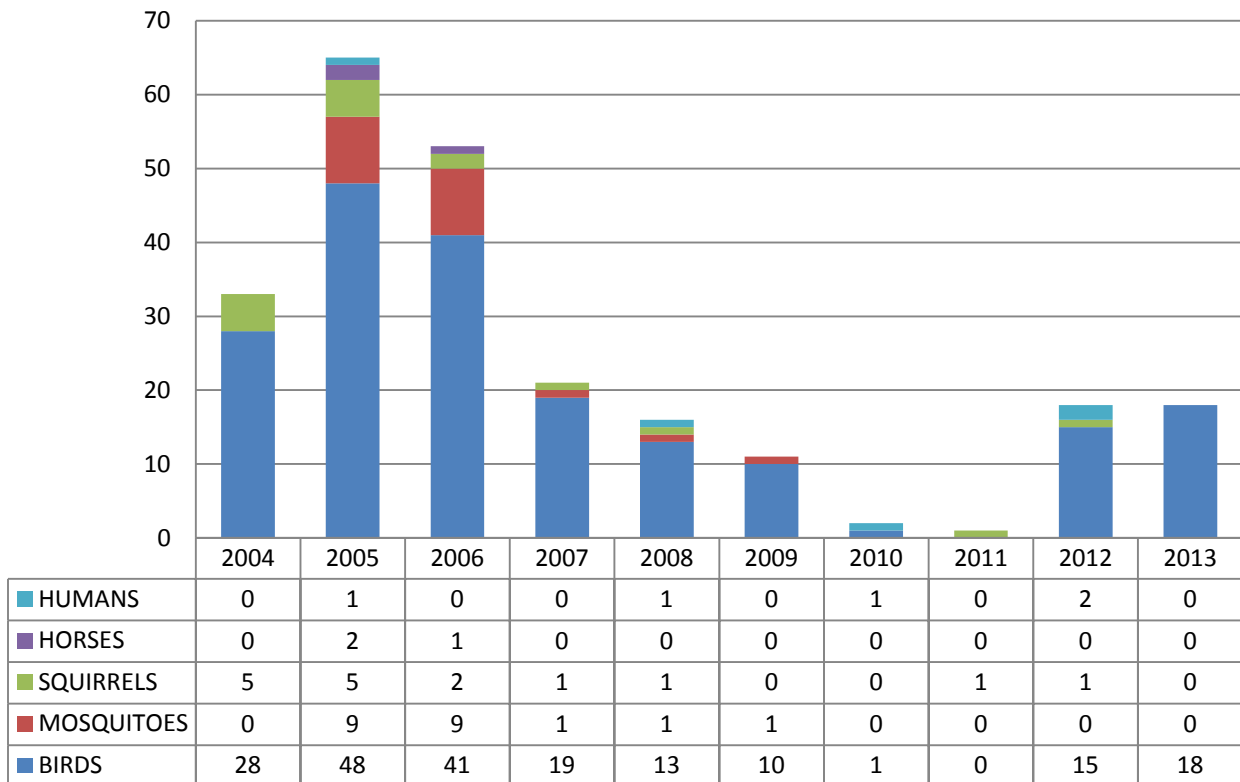
West Nile Virus

The 2013 season marks the 10th year that West Nile Virus (WNV) has been present in Alameda County. Figure 1 summarizes all the known WNV cases over the past 10 years, and separates the cases by humans, horse, squirrels, mosquitoes, and birds. Birds, an important tool for WNV surveillance, make up the bulk of the detections, and

the majority are those in the corvidae family (crows). Positive horses were seen early in 2005 and 2006 but since then the introduction of a vaccine has helped lower the risk to equines. Squirrels, although rarely found, are excellent indicators of localized transmission. The detection of WNV positive mosquitoes can indicate an increased risk to humans and are the most critical component of the WNV surveillance program. Over the 10 year span, five WNV positive humans have been recorded. More likely than not, all of these cases were acquired outside of District boundaries.

WNV activity peaked in its second year, 2005, declined steadily through 2011, and then resurged during the 2012 and 2013 seasons. This five year lull followed by a strong comeback is a pattern that has been observed in other parts of the country with a history of WNV activity. The inability to find a positive detection of mosquitoes over the last four seasons has been noted. Lower mosquito population (and thus fewer mosquitoes to trap and test) the last two seasons may be a factor, but seasons with average and above average mosquito populations (2010 and 2011) saw very little WNV. Importantly, there appear to be no positive correlations between mosquito abundance, rainfall, and levels of WNV activity. Presumably, the year to year fluctuations in WNV levels are due primarily to changes in susceptible bird populations. Using positive dead bird locations and an aggressive CO₂ trapping response, the District hopes to continue keeping its residents safe from WNV infection.

Figure 1. ACMAD WNV HISTORY



INVASIVE SPECIES

Aedes albopictus

Aedes albopictus, also known as the Asian Tiger Mosquito, is a very adaptable species native to Southeast Asia. This mosquito has entered California in the past but never



Aedes albopictus female

established itself until 2011 when it returned to California in San Gabriel Valley and parts of Los Angeles. Currently, *Ae. albopictus* activity is within a 12 sq. mile perimeter encompassing the cities El Monte, South El Monte, Arcadia, and Duarte. Vector control districts are putting forth their best efforts to control the infestation but eradication does not seem likely due to its preference to lay eggs in manmade containers with very little water such as plant saucers, tires, and even soda cans.

This mosquito is a major public health concern because it is a competent vector for dengue, yellow fever, and dog heartworm.

Aedes aegypti

Aedes aegypti, also known as the Yellow Fever Mosquito, is an invasive species native to Africa and is highly adaptive to its' environment. In 2013, *Ae. aegypti* was found in 3 California counties: Madera, Fresno, and San Mateo. Madera County has contained *Ae. aegypti* to less than a 3 mile perimeter, Fresno County has found *Ae. aegypti* in less than a 2 mile perimeter and San Mateo has contained the mosquito to less than a 1 mile perimeter.

The mosquito abatement districts are utilizing different control methods, increasing surveillance, and have been aggressive in controlling the spread of this mosquito. Public education has been critical in finding where *Ae. aegypti* are breeding. This species is a potential public health threat due to its affinity for transmitting



Aedes aegypti female

serious diseases such as Dengue, yellow fever, and Chikungunya. This mosquito breeds in manmade containers such as plant saucers, pottery, tires, etc. near humans and prefers to bite indoors. The obscure breeding areas make this mosquito especially challenging to find. To better prepare for the arrival of this species, ACMAD support and field staff visited Madera and San Mateo Counties to observe and assist their field operations.

New Surveillance Techniques

Due to their aggressive nature, obscure breeding sites, unique biting behavior, and capability to adapt in Alameda County, we have adopted additional surveillance methods to help us better monitor *Aedes aegypti* and *Aedes albopictus*. Early detection will be the best odds for eradicating these invasive species.



CDC Autocidal Gravid Ovitrap (AGO)

The AGO trap consists of a black five gallon bucket containing hay infused water with a hollow cylinder inserted into the lid. The hollow cylinder interior is lined with an adhesive glue board that captures the mosquito when she tries to lay her eggs in the water. The hollow cylinder is screened from both ends allowing the female to enter the cylinder, but she cannot enter the water bucket. The combination of the color black and the scent of hay infused water attract mosquitoes for egg laying. AGO traps have had success in capturing *Aedes aegypti* in Puerto Rico and other California abatement districts.

The BG Sentinel trap is a foldable white canvas cylindrical shaped bag that contains a fan and a small mesh bag to capture mosquitoes seeking blood meals. The trap requires a power source to operate the fan to keep mosquitoes in the bag. This trap does not kill, so collected mosquitoes can be tested for disease. The BG Sentinel mimics human convection activity with a human skin emanation lure. As a result, this trap is excellent for capturing mosquitoes that prefer human blood meals such as *Aedes aegypti* and *Aedes albopictus*.



BG Sentinel Trap

PUBLIC OUTREACH

With the resurgence of West Nile Virus (WNV) activity in 2012 and the introduction of *Aedes aegypti* into the Bay Area in 2013, the need to educate the public on the danger of mosquito-borne diseases and the importance of mosquito control in general greatly increased. As a part of this effort, the District continued its participation in numerous



2013 BART poster advertisement

and personal preventive measures to avoid mosquito bites. PennySaver ads focused on reminding the public to report dead birds for WNV surveillance. Distribution of the PennySaver ads covered the cities of Fremont, Hayward, Newark, Sunol, Dublin, Pleasanton, Livermore, San Leandro, San Lorenzo, and Union City. Cover advertisements were utilized in the cities of Dublin, Pleasanton, Livermore, and Fremont to maximize visibility in the areas we traditionally find the most WNV activity.

The annual Alameda County Fair provided the District with an opportunity to educate the public about the health significance of WNV and the need to eliminate backyard mosquito breeding sources. In 2012, the Alameda County Fair

celebrated its centennial which allowed the District to focus on the history of mosquito control in the Bay Area and Alameda County. The display had a "then and now" theme where one side was full of antique mosquito sources, treatment equipment, and black and white historical photos. The other side contained modern mosquito sources, treatment products, and full color photos. The District's 2013 display theme was "Mosquitoes 101," for the 101st Alameda County Fair. The open ended theme allowed

festivals, fairs, presentations, social media, and paid advertisement campaigns. The rise in mosquito related activity also created a renewed media interest and an increase in interview requests.

In 2012 and 2013, advertisements were placed in PennySaver publications distributed throughout the county and 6 Bay Area Rapid Transit (BART) stations. BART ads focused on draining standing water, reporting neglected swimming pools,



2013 PennySaver cover advertisement

the District to educate the public on all things mosquito related such as sources, biology, control methods, personal protection and trivia.

In an effort to keep local cities aware of the mosquito situation in their jurisdictions, numerous city council presentations were given. In 2013, these presentations included the cities of Newark, Union City, Dublin, Piedmont, Fremont, and Alameda.

As in the past, the District issued press releases about District surveillance activities, WNV detections, and seasonally appropriate ways to prevent mosquito production. Information was also disseminated through Facebook, Twitter, and the District website.



2012 Alameda County Fair Display

Shows and fairs the District participated in:

2012

- Alameda County Spring Home & Garden Show
- Dublin St. Patrick’s Day Festival
- The Tropics Senior Health & Resource Fair
- Berkeley Bay Festival
- Chabot College Return of the Swallows Festival
- East Hills 4-H Career Fair
- Hayward Cinco de Mayo Festival
- Girls Scout’s 100 Funhundred Celebration
- Palomares Elementary School Science Expo & Watershed Festival
- Alameda County Fair
- Healthy Parks, Healthy People Festival
- Hayward Zucchini Festival
- Newark Days Festival
- Alameda County Fall Home & Garden Show

2013

- Alameda County Spring Home & Garden Show
- Dublin St. Patrick’s Day Festival
- Oakland Earth Expo
- Berkeley Bay Festival
- Alisal Elementary Science Fair
- Emeryville Earth Day
- Chabot College Return of the Swallows Festival
- Livermore Spring Stampede
- Hayward Cinco de Mayo Festival
- Palomares Elementary School Science Expo & Watershed Festival
- Codornice Creek Walk
- UCB Botanical Garden “Bug Days”
- Alameda County Fair
- Hayward Zucchini Festival
- Newark Days Festival
- Alameda County Fall Home & Garden Show

REGULATORY UPDATE

Increasingly complex environmental regulations continue to be a major challenge for the District's mosquito control program. The District currently holds permits with the State and Regional Water Resources Control Boards, the US Fish and Wildlife Service, the National Marine Fisheries Service, the California Department of Fish and Wildlife, the Department of Pesticide Regulation, the County Agricultural Commissioner, and the Army Corps of Engineers. Five staff members at the District now spend all or part of their time working on regulatory compliance – gathering data, writing reports, meeting with regulatory agencies and researching new regulations as they develop and change. Compliance with some regulations now also requires hiring outside experts to write environmental documents to meet the permit requirements.



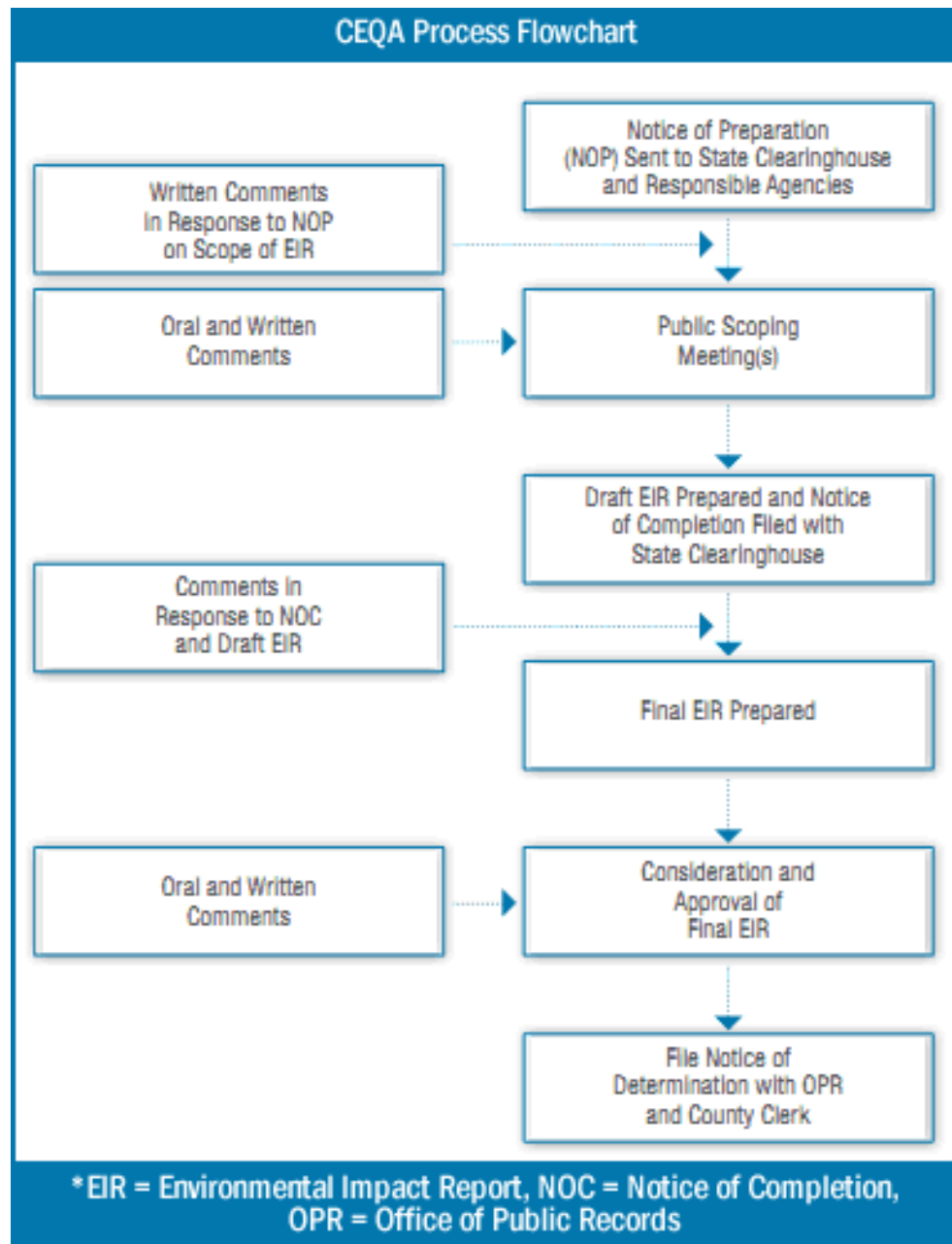
National Pollution Discharge Elimination System (NPDES) permit

In the last biennial report (2010-11), the District reported that the State Department of Water Resources had instituted a new National Pollution Discharge Elimination System (NPDES) permit for application of mosquito control products to waters of the US. The new permit made available in 2011 will be effective until the end of February 2016. The District applied for and received a NPDES permit on November 1, 2011. The 2011 permit had visual, physical, and chemical monitoring requirements. Visual monitoring required reporting the appearance of 10% of waters treated for characteristics such as color, turbidity, floating or suspended solids before, during and after applications of mosquito larvicides. Physical monitoring required measuring temperature, pH, turbidity and electrical conductivity for 10% of the applications. Chemical testing for the active ingredient was required for 10% of applications of the larvicide temephos (which this District no longer uses) and for 10% of adulticides applications. Although the District did not make any applications of adulticides on or near waters of the US in 2012 or 2013, it is important to maintain the ability to do so if an outbreak of mosquito-borne disease should occur. The new monitoring requirements were expensive in terms of time and money. Specialized sampling and testing for active ingredients must be done by outside specialists with advanced equipment capable of detecting materials in parts per billion (ppb). To assist local districts in meeting these monitoring requirements, a coalition was formed by members of the Mosquito and Vector Control Association of California. The District participated in the coalition, paying \$12,500 for its share of the cost of hiring a firm to conduct testing and prepare annual reports. After many

negotiating and educating efforts, the water board issued a letter to all coalition members allowing them to suspend individual district visual monitoring requirements in July of 2012. Visual monitoring requirements would now be fulfilled through participation in the coalition. This should decrease the time and money spent complying with the NPDES permit requirements in the future.

CEQA (California Environmental Quality Act)

In 2012, the District began the process of preparing a Programmatic Environmental Impact Report (PEIR). Along with eight other local mosquito and vector control agencies in the Coastal Region, the District hired a consultant (Cardno-Entrix) to prepare a template document that could be tailored to each agency's individual programs. The template document was completed in the spring of 2013 and District staff have spent



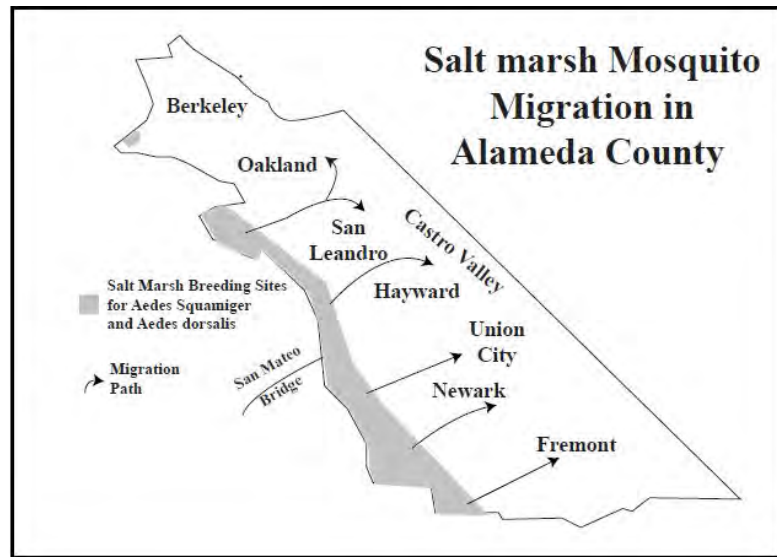
almost a year modifying this document to the District's specific program activities. The draft PEIR is expected to be ready to release for public comment the summer of 2014.

United States Fish and Wildlife Service Mosquito Management Plan (USFWS MMP)

In May 2012, the USFWS completed a Draft Comprehensive Conservation Plan (CCP) for the Don Edwards National Wildlife Refuge which included a “Mosquito Management Plan” outlining the Best Management Practices for mosquito control on the refuge. One of the requirements for completion of the CCP was obtaining a Biological Opinion from the Endangered Species office of the USFWS for impacts of mosquito control on

Refuge land on clapper rail and salt marsh harvest mice.

This document may have a significant impact on the cost of conducting mosquito control on the refuge. To date, the Biological Opinion has not been completed and made public. The District conducts control operations for winter and summer salt marsh mosquitoes on hundreds of acres of marsh along the shore of San Francisco Bay.



Much of this area is now within the boundaries of the Don Edwards National Wildlife Refuge. Mosquitoes arising from these lands have the potential to severely impact the health and comfort of residents in Alameda County. In fact, the impetus for the formation of the District in 1930 was the management of large populations of mosquitoes that developed in these areas and flew inland to feed on residents. Control of salt marsh mosquitoes in the larval stage, before they emerge as biting adults, is an important part of the District’s Integrated Vector Management Program.



Aedes dorsalis



Aedes squamiger

DISTRICT MANAGER JOHN RUSMISEL RETIRES



John Rusmisel, Alameda County Mosquito
Abatement District's fourth manager

With more than 30 years of service to the District, manager John Rusmisel officially retired on September 30, 2012. John was first hired by the District as a field technician on May 2, 1977. However, the District's funding was nearly cut in half with the passage of Proposition 13 and in August of 1978 John was laid off. In 1980, The District received state funding for encephalitis control and John was rehired in December. He spent almost 14 years working as a technician in the cities of Oakland, San Leandro, San Lorenzo, Hayward, Castro Valley, and Bay Farm Island. In 1992, John became the first District environmental specialist, a position he held until becoming manager in 1994.

Prior to joining the District, John obtained an Associates of Science degree in biology from Ohlone College in 1973 and then transferred to San Jose State University where he initially studied botany before switching his major to entomology. After completing his Bachelor of Science degree in entomology in 1976, John worked as a pest control advisor for Cal Ag Services. During his hiatus from the District in the late 70's, John worked as an entomology research assistant at Oregon State University.

With over a year of retirement under his belt, John was asked to reflect back on his tenure with the District.

Since your arrival at ACMAD, you have held many positions. Which job did you enjoy most?

The environmental specialist position was the most enjoyable. It allowed me to interact with multiple agencies and people so there were a lot of learning opportunities. I also really enjoyed the ability to work with technology and education.

What do you feel was your greatest accomplishment at the District?

There are five things that were accomplished during my time as manager that I am really proud of. The first was the DDT cleanup at the old Decoto Depot. That was my first big project as manager. It was a very complex operation and it had the potential for a lot of mistakes. Fortunately, everything went smoothly and I was even able to keep the cost down. The second, third, and fourth accomplishments are the passing of the benefit assessment, the new building addition, and the funding of the Other Post-Employment Benefits (OPEB) trust. All three of those help to ensure the future stability

of the District. The last thing I am very proud of is how we handled the introduction of West Nile Virus in Alameda County. We didn't have any human fatalities or locally acquired cases and we were able to do that without resorting to large scale fogging.

What was the biggest challenge you faced at the District?

Finances were the biggest challenge. I had to be fiscally responsible and still try to find a way to keep the District moving forward which was very difficult before the benefit assessment. It's not always easy dealing with the cards you are dealt.

You were with the District for over 30 years. What are the biggest changes you saw in that time?

There were big changes in the amount of information available to the public and the materials used to control mosquitoes. In a way, these changes may be interrelated and both are positive. The public now has more ways to get information with the District website and social media to name a few. The products used to control mosquitoes are now much more environmentally friendly and mosquito specific.



John working at a Home & Garden Show when he was the environmental specialist.

FINANCIAL REPORT
FOR FISCAL YEARS ENDING
JUNE 30, 2012 AND JUNE 30, 2013

	2012	2013
Revenues :		
Property taxes	\$1,494,741	\$1,521,578
Redevelopment distribution	\$184,951	\$261,117
Special Assessments	\$1,874,350	\$1,884,115
Homeowners Property Tax Relief, State Subvention	\$25,137	\$15,948
Interest	\$13,920	\$14,582
Miscellaneous	\$18,632	\$12,201
Total Revenues	\$3,611,731	\$3,709,541
Expenditures :		
Salaries and fringe benefits	\$1,898,153	\$1,915,545
Materials, supplies and services	\$491,167	\$574,833
Payment of CalPERS "side fund"		
& reduction of unfunded liability	\$0	\$825,406
Transfer to OPEB trust	\$500,000	\$500,000
Capital outlay	\$83,073	\$99,037
Total Expenditures	\$2,972,393	\$3,914,821
Net change in fund balances	\$639,338	(\$205,280)
Fund balances, beginning of period	\$2,829,400	\$3,468,739
Fund balances, end of period	\$3,468,738	\$3,263,459

**Alameda County Mosquito Abatement District
 Combined Balance Sheet For The Years
 Ending June 30, 2012 and June 30, 2013**

Assets	June 30, 2012	June 30, 2013
Current and Investments	\$3,458,686.00	\$3,423,584.00
Accounts receivable	\$ 127,071.00	\$ -
Capital Assets (Net)		
Non-depreciable assets	\$ 61,406.00	\$ 61,406.00
Depreciable assets, net	<u>\$2,758,278.00</u>	<u>\$2,654,943.00</u>
Total Assets	<u>\$6,405,441.00</u>	<u>\$6,139,933.00</u>
	=====	=====
 Liabilities		
Account Payable	\$ 14,764.00	\$ 41,175.00
Compensated Absences	<u>\$ 102,255.00</u>	<u>\$ 118,950.00</u>
Total Liabilities	<u>\$ 117,019.00</u>	<u>\$ 160,125.00</u>
	=====	=====
 Net Assets		
Invested in Capital Assets	\$2,819,684.00	\$2,716,349.00
Unrestricted	<u>\$3,468,738.00</u>	<u>\$3,263,459.00</u>
Total Net Assets	<u>\$6,288,422.00</u>	<u>\$5,979,808.00</u>
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