November 14, 2012

TO: Linsey Dale, Executive Director, ICFB

FROM: Nadim Shukry-Zeywar, TMDL Unit Chief

SUBJECT: Revising ICFB TMDL Program to Address Chlorpyrifos and Diazinon Impairments in Alamo and New Rivers

The Alamo River and the New River are listed on the 2008-2010 Clean Water Act (CWA) 303(d) list of impaired waters as impaired due to the current-use pesticides (chlorpyrifos and diazinon). Both pesticides are known to be toxic to aquatic organisms and exhibit additive effects when they occur together in aquatic systems. Imperial County Farm Bureau (ICFB) submitted a proposal in October 2011 to revise its current total maximum daily load (TMDL) Program to also include management practices (MPs) and reporting mechanism to address the impairments caused by chlorpyrifos and diazinon. Provided the proposal results in timely implementation of MPs that correct these impairments in all Imperial Valley water bodies, including the Alamo River and the New River, it can be used in lieu of adopting TMDLs to address those impairments.

The *Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options* (State Water Resources Control Board, adopted by Resolution 2005-0050); hereafter referred to as the "Impaired Waters Policy" provides policy and procedures for adopting Total Maximum Daily Loads and addressing impaired waters in California. The Impaired Waters Policy states that if a solution to an impairment is being implemented by a regulatory or non-regulatory action of another entity, and the Water Board finds that the solution will actually correct the impairment, the Water Board may certify that the regulatory or non-regulatory action will correct the impairment and if applicable, implement the assumptions of the TMDL, in lieu of adopting a redundant program. If the proposal is certified, Regional Water Board staff will track, monitor, assess, and report on activities of the revised ICFB TMDL Program to ensure it addresses the impairments.

ICFB TMDL PROGRAM CERTIFICATION STEPS

Step 1: Revising/Upgrading ICFB TMDL Program

The ICFB will revise/upgrade and implement its current TMDL Program to correct chlorpyrifos and diazinon impairments in three phases. In phase 1, ICFB will revise/upgrade its TMDL Program to include farm plans with specific MPs aimed at preventing or controlling the discharge of chlorpyrifos and diazinon into Alamo River and New River to the extent that the water quality criteria are achieved. The deadline to complete phase 1 is **December 2013**. In phase 2, ICFB will implement its upgraded TMDL Program. The deadline to complete phase 2 is **December 2015**. In phase 3, the ICFB TMDL Program will comply with Water Quality Standards (WQSs) regarding chlorpyrifos and diazinon. The deadline to complete phase 3 is **December 2018**. Regional Water Board staff will track, monitor, assess, and report on activities and progress of the ICFB TMDL Program.

Step 2: Certifying ICFB TMDL Program to Correct Chlorpyrifos and Diazinon Impairments

After the completion of Phase 1 above, the Regional Water Board or the Executive Officer will certify the revised/upgraded ICFB TMDL Program to be adequate to correct chlorpyrifos and diazinon impairments in Imperial Valley water bodies, including the Alamo River and the New River, in lieu of adopting TMDLs to address those impairments. Immediately following the certification, the Regional Water Board will recommend to the State Board and the USEPA that chlorpyrifos and diazinon impairments in Imperial Valley be placed at the being addressed category (4b) of the 303(d) List. The Regional Water Board or the Executive Officer may revise or revoke this certification if Water Board's staff finds that the ICFB TMDL Program is not adequately implemented or is no longer adequate to correct the chlorpyrifos and diazinon impairments.

WATER QUALITY CRITERIA TO BE ACHIEVED BY THE ICFB TMDL PROGRAM

Water quality criteria for chlorpyrifos and diazinon are listed in Table 1.

Table 1: Chlorpyrifos and diazinon water quality criteria. ppt = part per trillion

Compound	CMC[A] (ppt)	CCC[B] (ppt)
Chlorpyrifos	25	15
Diazinon	160	100

[A]CMC – Criterion Maximum Concentration or acute (1- hour average). Not to be exceeded more than once in a three year period.
[B]CCC – Criterion Continuous Concentration or acute (4- day average). Not to be exceeded more than once in a three year period.

These water quality criteria were developed by the California Department of Fish and Game (DFG). These criteria were used by the California Central Valley Water Board

and Central Cost Water Board, and approved by the USEPA. The criteria are for receiving waters, and they are applicable to each day of all seasons. All dischargers in the Imperial Valley must not discharge to Alamo River and New River at concentrations greater than the criteria in Table 1.

BACKGROUND

CWA and WQSs

In California, WQSs include: 1) designated beneficial uses; 2) narrative and/or numeric water quality objectives (WQOs) and numeric water quality criteria; and 3) an anti-degradation policy. Also, in California, beneficial uses are defined by the Regional Water Boards in the Basin Plans. Numeric and narrative objectives are specified in each region's Basin Plan and numeric criteria are included in the California Toxics Rule (CTR), designed to be protective of the beneficial uses. For the Alamo Rive and the New River, the most sensitive BUs to be addressed by this certification include: 1) contact and non-contact recreation (REC I and REC II); 2) warm freshwater habitat (WARM); 3) wildlife habitat (WILD); freshwater replenishment (FRSH); and 4) preservation of rare, threatened, and endangered species (RARE).

The CWA gives States the primary responsibility for protecting and restoring surface water quality. Under the CWA, States that administer the CWA must review, make necessary changes, and submit the CWA, Section 303(d) list to the U.S. Environmental Protection Agency (USEPA). The CWA also requires states to establish TMDLs or other equivalent regulatory program for waters not meeting WQSs. In some cases other regulatory programs, such as this certification, will address the impairment instead of a TMDL.

ICFB TMDL Program

In the past ten (10) years, the Regional Water Board adopted three sediment TMDLs and a Sediment Agricultural Prohibition for surface water bodies in the Imperial Valley that were approved by the State Water Resources Control Board (State Water Board), State Office of Administrative Law (OAL), and U.S. Environmental Protection Agency (USEPA). These TMDLs named Imperial Valley farmers and the Imperial Irrigation District (IID) as the major responsible parties for implementing these sediment TMDLs.

To assist Imperial Valley farmers comply with the TMDLs and the Prohibition, ICFB instituted a program entitled "ICFB TMDL Program" that included sediment management practices (MPs) that were identified by ICFB staff, Imperial Valley Farmers, IID, and the University of California Cooperative Extension (UCCE). Key elements of the ICFB TMDL Program are: 1) Enlists farmers in the ICFB TMDL Program

and tracks implementation standing; 2) Provides technical and educational support for farmers to comply with the TMDLs and the Prohibition; 3) Holds periodic meetings with program participants, IID, and Regional Water Board staff to discuss overall progress, problems, and areas that need further efforts; and 4) Reports on a quarterly and annual basis to Regional Water Board staff on all the above.

Alamo River and New River

The Alamo River and the New River are located within the Salton Sea Transboundary Watershed, in Mexicali Valley, Mexico, and Imperial Valley, California, the U.S. (Figures 1 and 2). The Alamo River is about 60 river miles in length, and its watershed is about 330,000 acres of Imperial Valley farmland in the U.S. Alamo River total flow at the outlet into the Salton Sea is about 600,000 acre-feet per year (AFY) (≈ 99.5% from the U.S.; and ≈ 0.5% is agricultural runoff from Mexico). The New River is about 80 river miles in length, and its watershed is about 200,000 acres of Imperial Valley irrigated farmland in the U.S., and 300,000 acres of Mexicali Valley urban areas and irrigated farmland in Mexico. New River total flow at the outlet into the Salton Sea is about 400,000 AFY (≈ 78% from the U.S.; and ≈ 22% from Mexico).

Agricultural runoff is the dominant source of flows into the Alamo River (≈ 96%) and the New River (≈ 91%). Sources of the rest of the flows into both rivers are treated industrial and domestic wastewater and urban runoff including stormwater runoff. Watersheds for both rivers provide important habitat for many different kinds of wildlife with birds are the most diverse wildlife group.

Chlorpyrifos and Diazinon

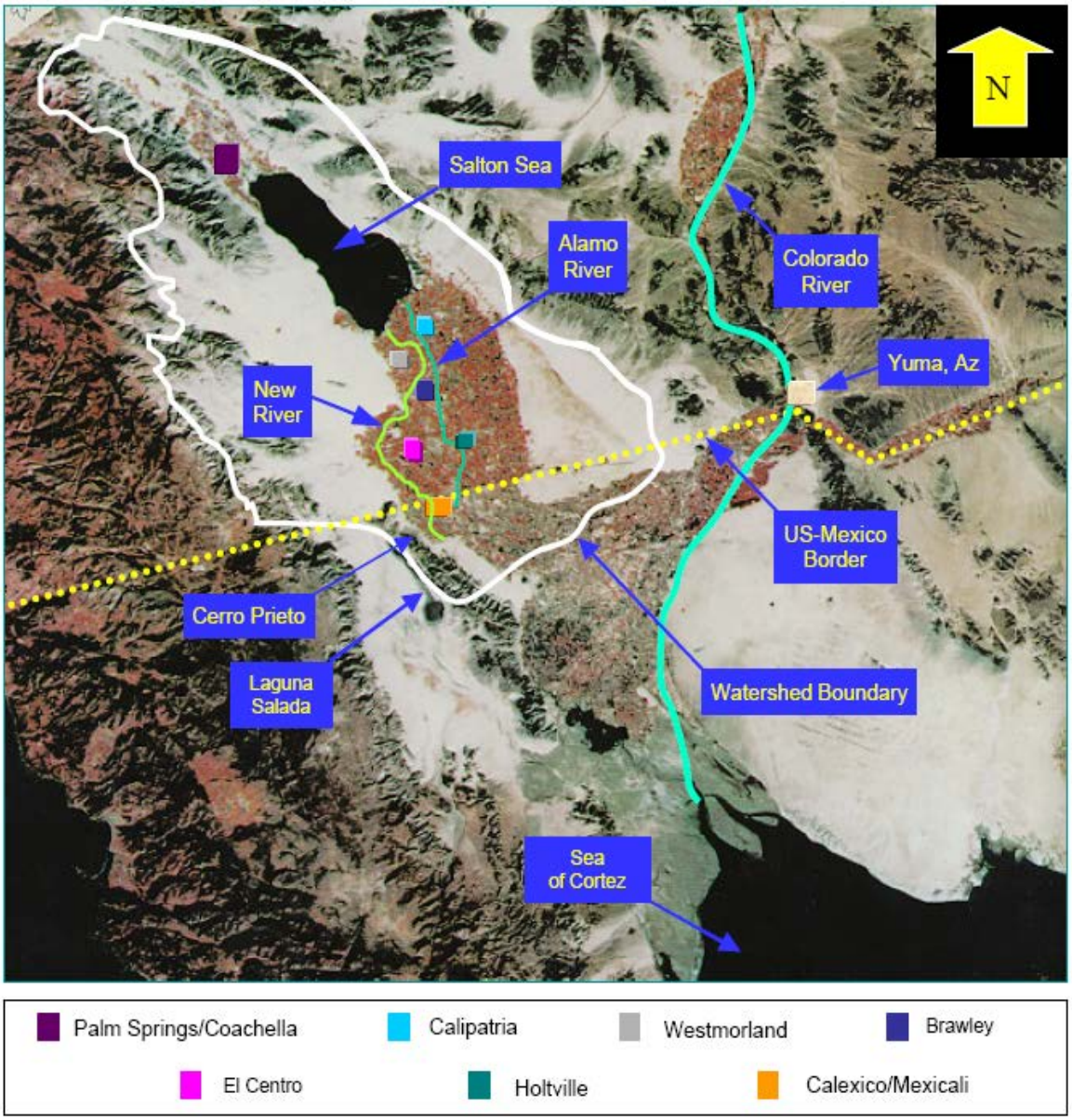
In 2001, the USEPA mandated the restriction of chlorpyrifos and diazinon including the phase out and elimination of all residential and non-agricultural uses. In 2007, the USEPA mandated more restrictions on the agricultural use of diazinon. In the Imperial Valley, chlorpyrifos is primarily applied to alfalfa and sugarbeets, and diazinon is applied to sugarbeets, lettuce, and broccoli. Chlorpyrifos has a high affinity for sediment and is relatively insoluble. Diazinon is moderately soluble and less strongly particle reactive. Accordingly, diazinon tends to be transported in dissolved phases, while chlorpyrifos is primarily transported with sediment. Both pesticides are known to be toxic to aquatic organisms and exhibit additive effects when they occur together in aquatic systems.

Source Analysis

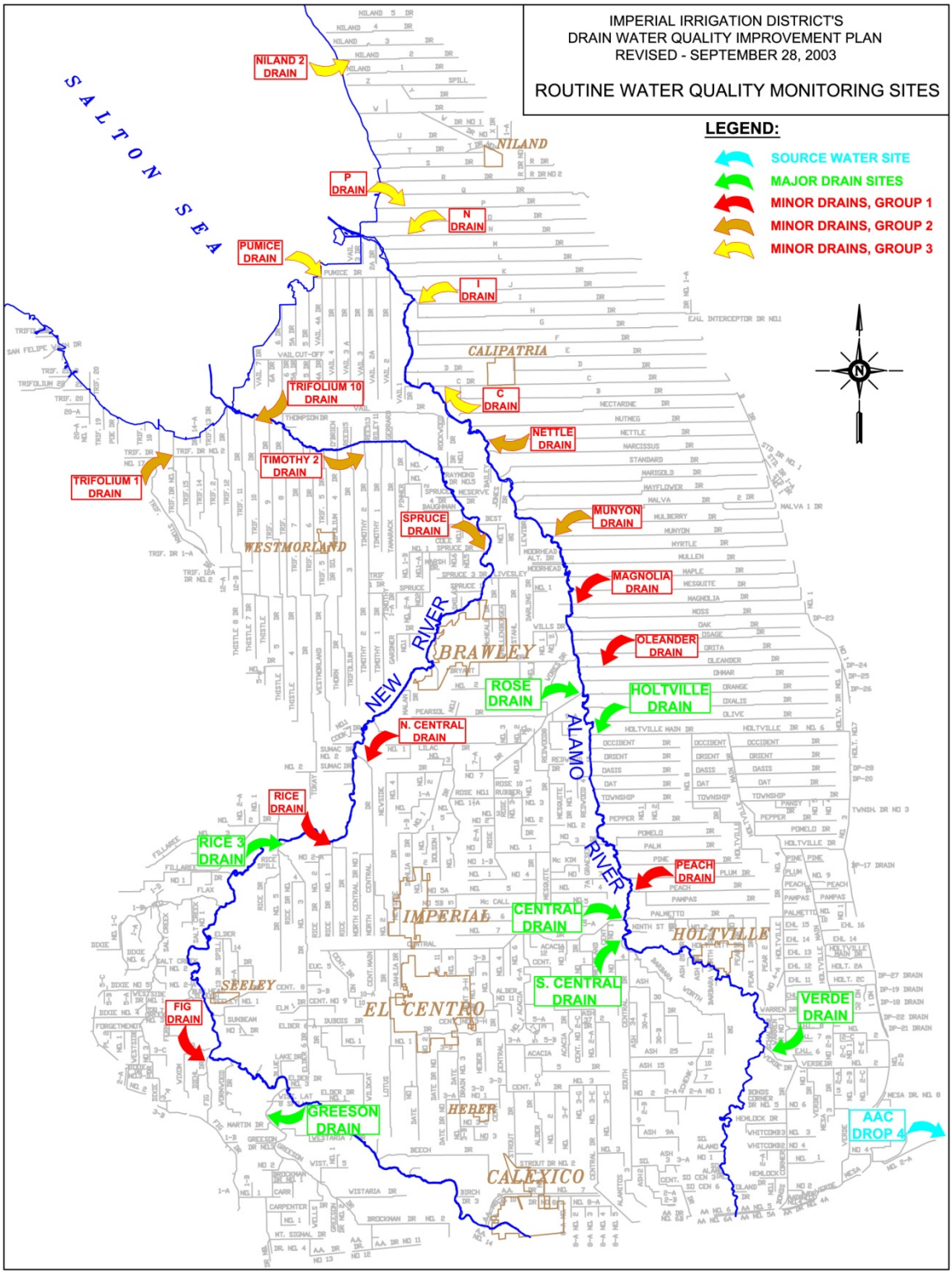
Data and source analysis was performed on readily available data from various organizations from 2006 to 2012 (Figures 3 to 7). These organizations include: The Regional Water Board; The California Surface Water Ambient Monitoring Program

(SWAMP); The U.S. Geological Survey; The California Department of Fish and Game; and The California Department of Pesticide Regulations. The analysis showed that the Alamo River and the New River are still impaired due to violations of water quality criteria for chlorpyrifos and diazinon. The analysis also showed that irrigated agriculture in the U.S. is the only cause of impairment by these two pesticides in both rivers. Furthermore, the analysis also showed that diazinon annual use from 2006 to 2010 and violations of the criteria were reduced significantly from 2006 to 2012. This reduction may be due to the additional restrictions on diazinon use mandated by the USEPA in 2007.

Figure 1: Salton Sea Transboundary Watershed (Gruenberg 1998)



<u>Figure 2:</u> Map of Main Sources of Water to the Imperial Valley in the U.S. (IID Drain Water Quality Improvement Plan Drain Map)


IMPERIAL IRRIGATION DISTRICT'S
DRAIN WATER QUALITY IMPROVEMENT PLAN
REVISED - SEPTEMBER 28, 2003
ROUTINE WATER QUALITY MONITORING SITES
LEGEND:
SOURCE WATER SITE
MAJOR DRAIN SITES
MINOR DRAINS, GROUP 1
MINOR DRAINS, GROUP 2
MINOR DRAINS, GROUP 3
SALTON SEA
NILAND 2 DRAIN
P DRAIN
N DRAIN
PUMICE DRAIN
I DRAIN
C DRAIN
TRIFOLIUM 10 DRAIN
NETTLE DRAIN
TIMOTHY 2 DRAIN
TRIFOLIUM 1 DRAIN
SPRUCE DRAIN
MUNYON DRAIN
MAGNOLIA DRAIN
OLEANDER DRAIN
ROSE DRAIN
HOLTVILLE DRAIN
N. CENTRAL DRAIN
RICE DRAIN
RICE 3 DRAIN
PEACH DRAIN
CENTRAL DRAIN
S. CENTRAL DRAIN
VERDE DRAIN
FIG DRAIN
GREESON DRAIN
AAC DROP 4
NEW RIVER
ALAMO RIVER
NILAND
CALIPATRIA
WESTMORLAND
BRAWLEY
IMPERIAL
HOLTVILLE
SEELEY
EL CENTRO
HEBER
CALEXICO

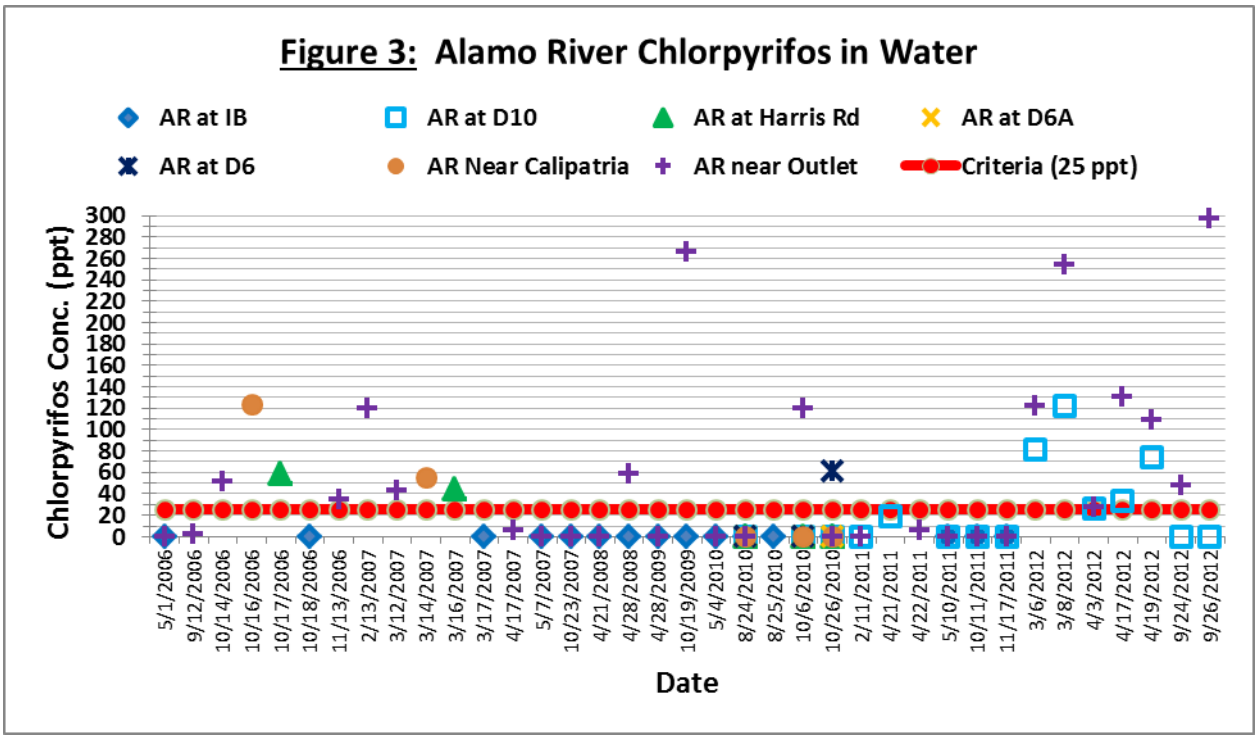


Figure 3: Alamo River Chlorpyrifos in Water
AR at IB
AR at D10
AR at Harris Rd
AR at D6A
AR at D6
AR Near Calipatria
AR near Outlet
Criteria (25 ppt)
Chlorpyrifos Conc. (ppt)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
5/1/2006
9/12/2006
10/14/2006
10/16/2006
10/17/2006
10/18/2006
11/13/2006
2/13/2007
3/12/2007
3/14/2007
3/16/2007
3/17/2007
4/17/2007
5/7/2007
10/23/2007
4/21/2008
4/28/2008
4/28/2009
10/19/2009
5/4/2010
8/24/2010
8/25/2010
10/6/2010
10/26/2010
2/11/2011
4/21/2011
4/22/2011
5/10/2011
10/11/2011
11/17/2011
3/6/2012
3/8/2012
4/3/2012
4/17/2012
4/19/2012
9/24/2012
9/26/2012
Date

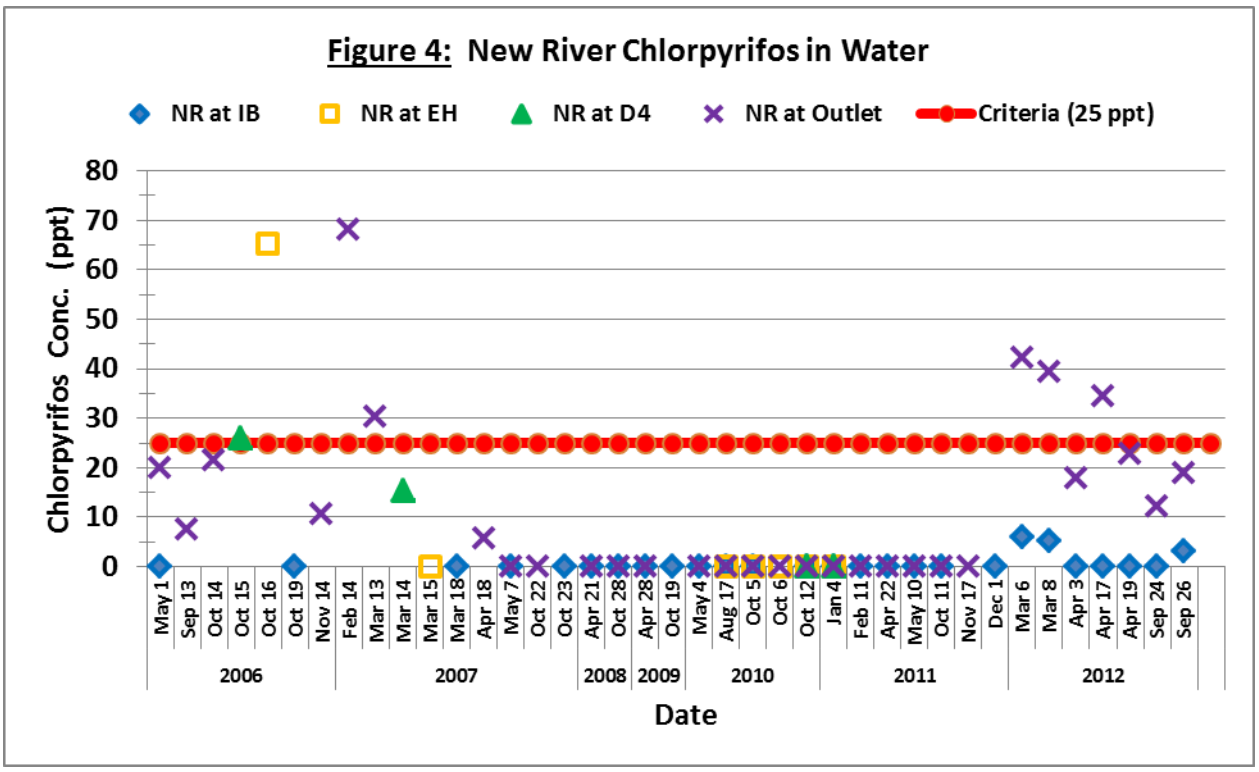


Figure 4: New River Chlorpyrifos in Water
NR at IB
NR at EH
NR at D4
NR at Outlet
Criteria (25 ppt)
Chlorpyrifos Conc. (ppt)
80
70
60
50
40
30
20
10
0
May 1
Sep 13
Oct 14
Oct 15
Oct 16
Oct 19
Nov 14
Feb 14
Mar 13
Mar 14
Mar 15
Mar 18
Apr 18
May 7
Oct 22
Oct 23
Apr 21
Oct 28
Apr 28
Oct 19
May 4
Aug 17
Oct 5
Oct 6
Oct 12
Jan 4
Feb 11
Apr 22
May 10
Oct 11
Nov 17
Dec 1
Mar 6
Mar 8
Apr 3
Apr 17
Apr 19
Sep 24
Sep 26
2006
2007
2008
2009
2010
2011
2012
Date

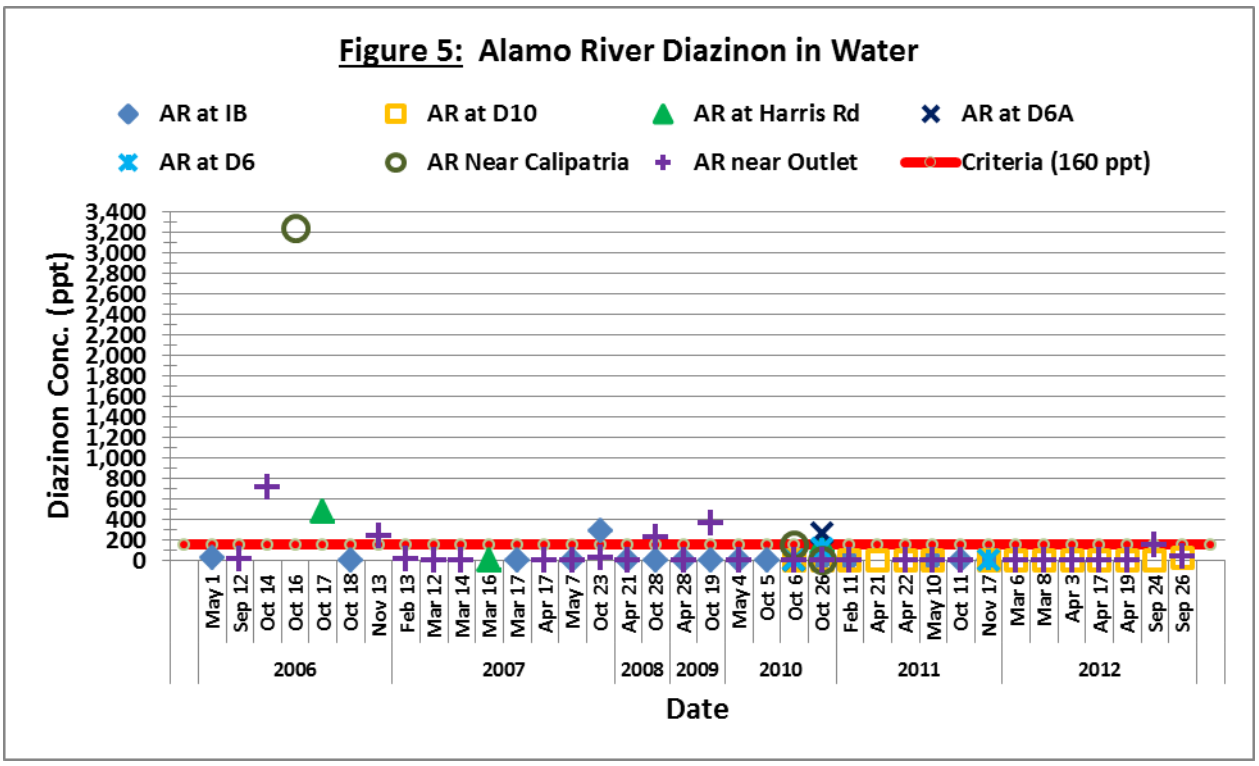


Figure 5: Alamo River Diazinon in Water
AR at IB
AR at D10
AR at Harris Rd
AR at D6A
AR at D6
AR Near Calipatria
AR near Outlet
Criteria (160 ppt)
Diazinon Conc. (ppt)
3,400
3,200
3,000
2,800
2,600
2,400
2,200
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
May 1
Sep 12
Oct 14
Oct 16
Oct 17
Oct 18
Nov 13
Feb 13
Mar 12
Mar 14
Mar 16
Mar 17
Apr 17
May 7
Oct 23
Apr 21
Oct 28
Apr 28
Oct 19
May 4
Oct 5
Oct 6
Oct 26
Feb 11
Apr 21
Apr 22
May 10
Oct 11
Nov 17
Mar 6
Mar 8
Apr 3
Apr 17
Apr 19
Sep 24
Sep 26
2006
2007
2008
2009
2010
2011
2012
Date

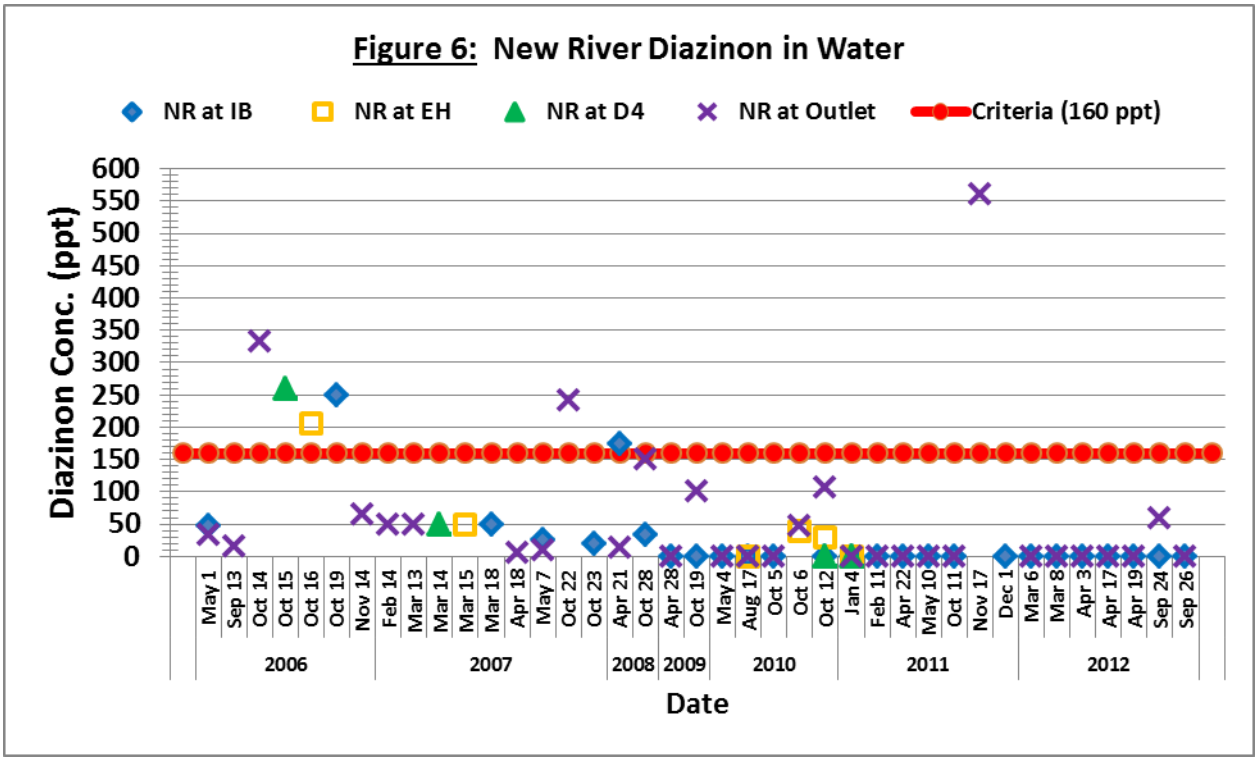


Figure 6: New River Diazinon in Water
NR at IB
NR at EH
NR at D4
NR at Outlet
Criteria (160 ppt)
Diazinon Conc. (ppt)
600
550
500
450
400
350
300
250
200
150
100
50
0
May 1
Sep 13
Oct 14
Oct 15
Oct 16
Oct 19
Nov 14
Feb 14
Mar 13
Mar 14
Mar 15
Mar 18
Apr 18
May 7
Oct 22
Oct 23
Apr 21
Oct 28
Apr 28
Oct 19
May 4
Aug 17
Oct 5
Oct 6
Oct 12
Jan 4
Feb 11
Apr 22
May 10
Oct 11
Nov 17
Dec 1
Mar 6
Mar 8
Apr 3
Apr 17
Apr 19
Sep 24
Sep 26
2006
2007
2008
2009
2010
2011
2012
Date

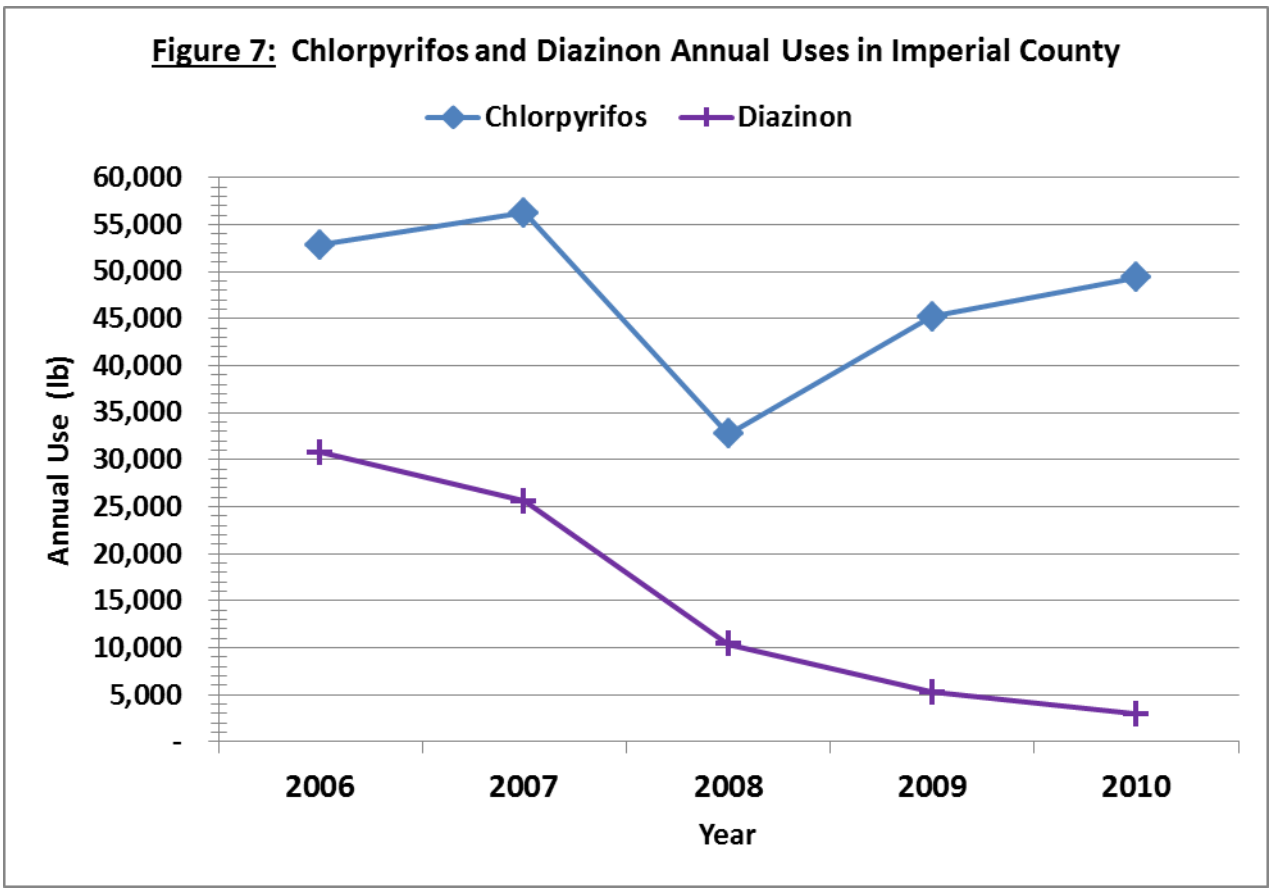


Figure 7: Chlorpyrifos and Diazinon Annual Uses in Imperial County
Chlorpyrifos
Diazinon
60,000
55,000
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
-
Annual Use (lb)
2006
2007
2008
2009
2010
Year