

**California Regional Water Quality Control Board
San Diego Region**

**Total Maximum Daily Load (TMDL) for
Chollas Creek Watershed
Diazinon**

**Draft Source Analysis
December 17, 1999**

Source Analysis

The purpose of the Source Analysis is to demonstrate that all pollutant sources have been considered, and loadings from significant sources estimated, in order to help determine the degree of loading reductions needed to meet numeric targets and allocate loading allowances among sources.

Diazinon is available in many different formulations (i.e. concentrated liquid, ready-to-use liquid, dust, granules, pressurized sprays, etc.) and is used on a broad spectrum of target pests (i.e. ants, fleas, spiders, cockroaches, aphids, white flies, etc.). Because of the many possible combinations of diazinon formulation and target pest, there are many potential pathways for diazinon to reach surface water. In general, diazinon can reach surface water in runoff from rain, runoff from landscape irrigation, or illegal dumping. Several studies in northern California have indicated that diazinon use according to label instructions could result in diazinon concentrations that exceed the water quality target in storm water runoff. Further investigation is needed to determine conclusively if the elevated storm water diazinon concentrations are caused by lawful diazinon use or by illegal discharges or a combination of both.

The amount of diazinon discharged to surface waters from various sources is not well documented. In order to estimate the diazinon loading from sources to Chollas Creek, an assumption is made that the amount of diazinon discharged to the creek from the pollutant sources is related to the amount of diazinon used in the watershed. The relationship between the amount of diazinon used and the amount discharged to surface water is unknown at this time. All source estimates in this document are based on the amount of diazinon used.

To estimate the amount of diazinon used in the Chollas Creek watershed, reported diazinon use and unreported diazinon use were calculated using available data. Reported diazinon use was calculated using the California Department of Pesticide Regulation Pesticide Use Reporting database for 1997. Reported uses include all pesticide use for agriculture, parks, golf courses, rights-of-way, cemeteries, landscape maintenance, and structural pest control. Unreported pesticide uses include home and garden use as well as many industrial and institutional uses of over-the-counter products. The amount of diazinon used for unreported uses in residential, industrial, institutional, and commercial

settings is not well documented. In urban areas such as the Chollas Creek Watershed, approximately 60% of diazinon active ingredient is used for unreported uses.

Reported Use of Diazinon

Since 1990, the California Department of Pesticide Regulation (DPR) has required reporting of pesticide use by agriculture and other commercial applicators. Pesticide use reports include location, amounts applied, number of acres, and types of crops or places (e.g., structures, roadsides) treated. Commercial applications including structural fumigation, structural pest control, and turf applications must also be reported. Reporting of home and garden use and most industrial and institutional use is not required. DPR compiles all of the reported use information into the Pesticide Use Report (PUR) Database.

Pesticide use is generally expressed in terms of the amount of active ingredient, i.e. the component in the pesticide product that actively kills or otherwise controls the target pest. There are a variety of pesticide products that contain different concentrations of active ingredient and inert substances. Expressing pesticide use in terms of active ingredient allows comparison of different products using a common factor. Diazinon active ingredient is pure diazinon with no inert substances. Diazinon product includes the inert substances that are sold with the diazinon.

Table 1 shows the amount of diazinon use reported in California as obtained from the "Summary of Pesticide Use Report Data" for 1993, 1994, 1995, 1996, and 1997. The amount of diazinon used varies greatly from year to year.

Table 1: Reported Diazinon Active Ingredient Use in California

Year	Pounds Used
1993	1,491,709
1994	1,387,854
1995	2,376,882
1996	1,093,120
1997	955,108

Table 2 shows reported pesticide use data for San Diego County as obtained from the Pesticide Use Report database on compact disk for 1997. Diazinon use was divided into three categories of applications: Agriculture, Landscape Maintenance, and Structural Pest Control. For each category, the pounds of diazinon active ingredient, pounds of diazinon product, and the number of applications are shown. Diazinon products used for agricultural purposes are generally more concentrated than diazinon products used for structural pest control. Diazinon products used for landscape maintenance are far less concentrated than those used for structural pest control or agriculture. The predominant reported use of diazinon in San Diego County is structural pest control.

Table 2: Reported Diazinon Use in San Diego County

Purpose	Pounds of Diazinon Active Ingredient	Pounds of Diazinon Product	Number of Applications	Percent of Active Ingredient in Product
Agriculture	2,505	8,022	618	31%
Landscape Maintenance	850	9,205	2,191	9%
Structural Pest Control	24,240	96,730	43,553	25%
Total Reported Use	27,595	113,957	46,362	

Reported diazinon use information specific to the Chollas Creek Watershed is not available. Table 3 shows an estimate of the amount of reported diazinon use in the Chollas Creek Watershed. Structural pest control is estimated to be the predominant reported use of diazinon in the Chollas Creek Watershed.

Reported diazinon use for landscape maintenance and structural pest control is estimated for the Chollas Creek Watershed using the San Diego County data corrected for the amount of land use area in Chollas Creek. Chollas Creek contains approximately 5% of the urban land use in San Diego County. Urban land use for this report is defined as residential, commercial, and industrial uses. Roadways and open space are not considered urban land uses for this report because diazinon is generally not used in these areas.

Agricultural use is estimated to be negligible on a watershed basis because nurseries are the only activity in the Chollas Creek Watershed classified in the agricultural category. A separate survey of nurseries was conducted for the watershed which determined that most nurseries in the watershed use no diazinon.

Table 3: Estimated Reported Diazinon Use in the Chollas Creek Watershed

	Pounds of Diazinon Active Ingredient	Pounds of Diazinon Product
Agricultural	negligible	negligible
Landscape Maintenance	42	452
Structural Pest Control	1,191	4,753
Total	1,233	5,205

A limited survey was conducted of the schools, city parks, cemeteries, nurseries, kennels, and the California Department of Transportation (CalTrans) in the Chollas Creek Watershed. A representative of each agency or facility was telephoned and surveyed on diazinon use. Generally, the telephone contact was followed up with a letter or other written information.

Agencies and facilities were also surveyed on Integrated Pest Management (IPM) which is an ecosystem-based strategy that focuses on long-term control of pests or their damage through a combination of techniques such as biological control, habitat manipulation,

modification of cultural practices, and use of pest resistant plant varieties. In general IPM provides for pesticide use only after monitoring indicates the need for pesticides according to established guidelines, and treatments are made with the goal of removing only the target organism. Under IPM, pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment.

Schools – The San Diego Unified School District (School District) manages the public schools in the watershed. The School District has had an IPM plan since 1991. There are 58 public school in the Chollas Creek Watershed out of approximately 165 public schools managed by the School District. The School District reports that a total of 70 fluid ounces of a pesticide product containing diazinon was used in the district over the past 2 years.

City Parks – Portions of the cities of La Mesa, Lemon Grove and San Diego are located in the Chollas Creek Watershed and own the main parks in the area. These cities all report that diazinon is not used on park landscaping. Structural pest control is done by outside contract and no estimates of diazinon use were available. The City of La Mesa has an IPM plan, and the cities of Lemon Grove and San Diego are developing an IPM plan.

Cemeteries – Four large cemeteries in the Chollas Creek watershed were contacted about diazinon usage: Cypress View-Bonham Brothers Mortuary, Greenwood Memorial Park and Mortuary, Holy Cross Catholic Cemetery and Mausoleum and Mount Hope Cemetery. The Home of Peace Cemetery could not be reached. One cemetery indicated that 9.25 gallons of the pesticide Sunbugger (0.5% Diazinon) was used in the past two years for landscape maintenance. The others indicated no diazinon was used for landscape maintenance. All structural pest control is done by outside contract and no estimates of diazinon use were available. The cemeteries had little or no knowledge of IPM and did not have IPM plans.

Nurseries – There are four nurseries in the Chollas Creek Watershed. Three of these nurseries reported using no diazinon onsite. One nursery reported using about one gallon of a pesticide product containing diazinon per year onsite.

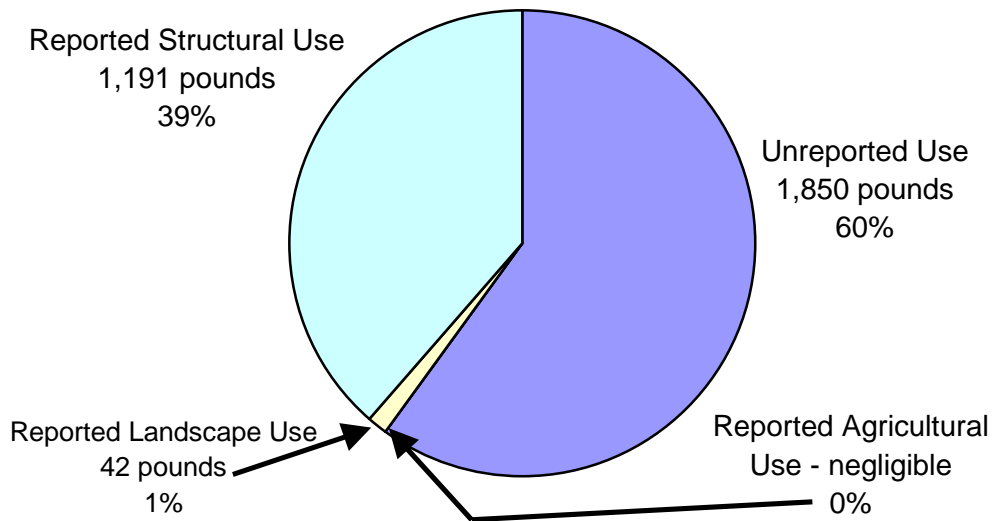
Kennel – Only one kennel is located in the Chollas Creek Watershed and it reported no use of diazinon.

CalTrans – The California Department of Transportation (CalTrans) is responsible for the major freeways that run through the watershed. Roadways make up about 4% of the watershed's land use. However, CalTrans reports that diazinon is not used on their facilities. CalTrans has an IPM plan which discusses their efforts to minimize pesticide use to benefit human health and the environment.

Unreported Use of Diazinon

Unreported uses of diazinon include home and garden use as well as many industrial and institutional uses of over-the-counter products. The amount of diazinon used for unreported uses in residential, industrial, institutional, and commercial settings is not well documented. According to the DPR 1997 Summary of Pesticide Use Report Data, about two-thirds of all pesticide active ingredients sold in a given year are for unreported uses. For diazinon in urban areas, unreported uses account for approximately 60% of total diazinon active ingredient use. From Table 3 above, approximately 1,233 pounds of diazinon active ingredient were reported used in Chollas Creek in 1997. Using the 60% of total use and the 1,233 pounds of reported use, it is estimated that unreported uses account for approximately 1,850 pounds of diazinon active ingredient use in the Chollas Creek Watershed. From this information shown in Figure 1, it appears that unreported uses of diazinon are equal or more important as a source of diazinon to surface waters than reported uses.

Figure 1. Estimated Reported vs. Unreported Diazinon Use in Chollas Creek



Surveys in the San Francisco Bay Area found that ants, grubs, aphids, spiders, and fleas were the main target pests for diazinon used in residential areas. The grubs were targeted mainly to control the raccoons which eat the grubs. Raccoons are not a major problem in San Diego, but other uses of diazinon are expected to be similar in the San Francisco area and San Diego area. The target pests for residential use of diazinon in San Diego are ants, fleas, and aphids. Treatment for ants generally involves application of diazinon around the border of the house as a barrier to ants. Although, some diazinon is used indoors, indoor uses appear to be a minor fraction of overall diazinon use. Treatment for

fleas generally involves application of diazinon to cover the entire lawn. Treatment for aphids generally involves application of diazinon to individual problem plants.

National Pollutant Discharge Elimination System (NPDES) Permits

Another way to identify sources of diazinon is by National Pollutant Discharge Elimination System (NPDES) permits in the watershed. Each discharge regulated by an NPDES permit can be considered a potential source of diazinon. Because Chollas Creek is a small creek in an urban area in southern California, the only NPDES permits in the watershed are for storm water conveyance systems. These storm water conveyance systems are the main transmission routes for pollutants to enter surface water. The agencies (permittees) named in the NPDES permits are responsible for everything that is discharged to and from their storm water conveyance systems. The permittees are responsible for isolating and controlling sources of pollutants even if the permittee does not use the pollutant. There are two NPDES permits that regulate discharges in the watershed that could be sources of diazinon discharged to surface water.

The San Diego Municipal NPDES Storm Water Permit regulates all municipal storm water runoff in storm water conveyance systems in San Diego County. Diazinon is used in residential, industrial and commercial areas which drain to this storm water conveyance system and then to surface waters. The objective of the permit is to reduce or eliminate the discharge of pollutants into and from the storm water conveyance system. The co-permittees named in this permit which are responsible for discharges into the Chollas Creek watershed are:

City of San Diego
San Diego Unified Port District
City of Lemon Grove
City of La Mesa

The Statewide Storm Water Permit and Waste Discharge Requirements for the State of California, Department of Transportation (CalTrans) regulates all CalTrans municipal storm water activities as well as all construction activities. CalTrans is responsible for all runoff from their right-of-way. However, CalTrans reports that no diazinon is used on their facilities. CalTrans facilities do not appear to be a source of diazinon discharge to Chollas Creek.

Because CalTrans uses no diazinon, the only NPDES source of diazinon in the Chollas Creek Watershed is the storm water conveyance system regulated by the San Diego Municipal NPDES Storm Water Permit.

Recommendations and Plans for Further Source Analysis

Because of the limited amount of information concerning sources of diazinon in the watershed, additional source analysis activities will be required in the implementation section of this TMDL. Some additional source analysis activities are currently ongoing or planned.

The Department of Pesticide Regulation (DPR) is planning to conduct some urban source analysis monitoring programs in the next few years. These DPR monitoring programs will be designed to better identify the products and uses which cause the highest diazinon concentrations in urban runoff. The results of these DPR urban monitoring programs are intended to be applicable statewide regardless of the actual monitoring location.

The monitoring program for the San Diego Municipal NPDES Storm Water Permit has been modified to address some source analysis questions. A pesticide use survey will be conducted to characterize the use of diazinon by residential and commercial applicators in San Diego County. Additional monitoring for diazinon in Chollas Creek is also being considered.

CalTrans is currently developing a sample plan for Chollas Creek in the 1999-2000 wet season. The CalTrans sample plan will involve sample collection at two stations on the south fork of Chollas Creek. One station will be just above the confluence of the north and south fork and the other station will be further upstream. Grab samples will be collected and composited before analysis. Toxicity tests and limited toxicity identification evaluations are planned for the composite samples.

Improvements in the source analysis are expected to assist in the development of the implementation plan for this TMDL. The source analysis and implementation plan may be revised as new information becomes available.

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