

How Pesticides are Regulated to Protect Ground Water

Department of Pesticide Regulation
Environmental Monitoring Branch

February 2007

Ground Water Protection Regulations In Agricultural, Outdoor Industrial and Outdoor Institutional Use Settings California Code of Regulations Title 3 (3CCR), Division 6

What this Document Covers

This document describes the Department of Pesticide Regulation's ground water protection regulations that became effective May 27, 2004. Specifically it

- identifies the pesticides that have been found in ground water due to legal agricultural use,
- describes the conditions and pathways that lead to ground water contamination,
- tells how to identify areas that are vulnerable to pesticide movement to ground water,
- summarizes the management practices that are designed to minimize pesticide movement to ground water.

Pesticides Found in Ground Water

The following eight currently registered pesticides have been found in California ground water due to legal agricultural use:

aldicarb	diuron
atrazine	prometon
simazine	bentazon
bromacil	norflurazon.

All except aldicarb are listed in 3CCR section 6800(a).

Conditions and Pathways Associated with Pesticide Movement to Ground Water

Analysis has shown that pesticides move to ground water under certain soil conditions, and are more frequently found when depth to ground water is shallower than 70 feet. The principal soil classifications associated with ground water contamination and regulated to protect ground water are certain coarse soils and hardpan soils. Each of these general soil categories is associated with a different pathway to ground water.

Leaching

In coarse, sandy soils, leaching is the principal pathway. Field studies have shown that because of the relatively low amounts of rainfall that occur in most agricultural areas of California, irrigation is the main source of water that moves pesticides to ground water via leaching.

Runoff

In hardpan soils, the principal pathway is runoff to dry wells, ditches, sumps or ponds, soils with deep cracks or to coarse soil areas. Since most applications of 6800(a) pesticides occur from late fall to early spring, rainfall, not irrigation, is the main source of water that moves pesticides to ground water via runoff.

Each pathway, leaching and runoff, requires different management practices to protect ground water (see below).

Areas Vulnerable to Pesticide Movement to Ground Water

DPR has identified, in regulation, areas of the state that are vulnerable to pesticide movement to ground water. These vulnerable areas are called ground water protection areas (GWPA)s, and are listed by county, base meridian, township, range and section in a document referenced in the regulations. Currently, there are leaching GWPA)s and runoff GWPA)s. All sections of land where pesticides have been found in ground water due to legal agricultural use are designated as GWPA)s. Additional sections of land are designated as GWPA)s because they contain either certain coarse soils or hardpan soils associated with pesticide movement to ground water, and they have an average depth to ground water of 70 feet or less. There are GWPA)s in 34 counties.
(3CCR section 6000)

GWPA)s are available as lists, maps, and shapefiles on the DPR website.

Locations of GWPA)s are also available from

- County Agricultural Commissioners
- the Environmental Monitoring Branch, DPR at 916-324-4086.

Restricted Material Permits and Certification Requirements

All agricultural, outdoor industrial, and outdoor institutional uses of products containing chemicals listed in 3CCR 6800(a) are restricted materials. However, unlike most restricted materials, 6800(a) pesticides only require a Restricted Materials permit when used inside GWPA)s, unless restricted for purposes other than ground water protection. Also, since 6800(a) pesticides are restricted materials statewide, they may only be applied by, or under

the supervision of, a certified applicator both inside and outside GWPA)s.
(3CCR section 6416)

Statewide Use Restrictions

The following restrictions apply to 6800(a) pesticides statewide (inside and outside GWPA)s:

Artificial recharge basins: do not apply below the high water line inside artificial recharge basins, unless the pesticide is applied six months or more before the basin is used to recharge ground water.
(3CCR section 6487.1)

Canal and ditch banks: do not apply below the high water line inside canals and ditches, unless at least one of the following applies:

(a) the pesticide user can document that the percolation rate of the canal or ditch is equal to or less than 0.2 inches per hour; or

(b) the pesticide is applied six months before water is run in the canal or ditch.
(3CCR section 6487.2)

Restrictions in Runoff GWPA)s (Except on Engineered Rights of Way)

Use of 6800(a) pesticides is prohibited in runoff GWPA)s unless **one** of the following management practices can be met and is designated by the County Agricultural Commissioner on the permit:

(a) Apply the pesticide as a band treatment immediately adjacent to the crop row so that not more than 33 percent of the distance between rows is treated (for citrus, the band may extend out to the drip line of the tree); **or**

(b) Disturb the soil to be treated that is outside of the 33% band, or outside the dripline in citrus, by using a disc, harrow, rotary tiller, or other mechanical method within seven days before the pesticide is applied (not an option for bentazon); **or**

(b) Incorporate the pesticide on at least 90 percent of the area treated outside of the 33%

band, or outside of the dripline in citrus, within 48 hours after the day the pesticide is applied. Incorporation may be by mechanical methods, such as by using a disc, harrow, or rotary tiller, or by sprinkler or low flow irrigation (1/4 – 1 inch of water applied at a rate that does not cause runoff), including chemigation if allowed by the label (not an option for bentazon), **or**

(d) Apply the pesticide between April 1 and July 31; **or**

(e) Retain all irrigation runoff and all precipitation on, and drainage through, the field for six months following the application. If a retention area (sump) is used, its percolation rate shall not exceed 0.2 inches per hour unless the runoff water is completely recirculated onto the treated field or an adjacent field every 24 hours; **or**

(f) Channel runoff to a retention area off the application site, under the control of the property operator, that is designed to retain all irrigation runoff and all precipitation on, and drainage through, the treated field and all other areas draining into that retention area, for six months following the application. The percolation rate of the retention area shall not exceed 0.2 inches per hour; **or**

(g) For six months following application, runoff shall be managed so that it runs off onto an adjacent unenclosed fallow field at least 300 feet long that is not irrigated for six months after application, with full consideration of any plant back restrictions

(h) For the tops and land side banks of canals, and for rights of way, no additional management practice is required if runoff flows onto adjacent land equal in size to the treated area, where it infiltrates and does not move to structures such as dry wells, ditches or excavated retention areas with percolation rates of greater than 0.2 inches per hour.

(3CCR section 6487.4, as amended by Enforcement Letters ENF 2004-022 and ENF 2005-006)

Restrictions in Leaching GWPA's (Except on Engineered Rights of Way)

Use of 6800(a) pesticides is prohibited in leaching GWPA's unless any **one** of the following management practice options can be met and is designated by the County Agricultural Commissioner on the permit:

(a) Do not apply any irrigation water for six months following application of the pesticide; **or**

(b) Apply the pesticide to the planting bed or the berm so that it is not contacted by irrigation water in the furrow or basin for six months following application of the pesticide; **or**

(c) Manage the irrigation so that the amount of irrigation water applied does not exceed the net irrigation requirement multiplied by 1.33 for six months following application of the pesticide.

(3CCR section 6487.5)

Efficient Irrigation

Property managers are more likely to irrigate efficiently in leaching GWPA's when they

- Use a pressurized irrigation system (sprinkler or low flow)
- Schedule irrigations based on soil moisture levels, measured plant water status, or calculated evapotranspiration (ET) since the last irrigation
- Calculate the amount of water to apply in each irrigation based on the effective plant root depth, the soil water holding capacity, and the soil moisture level; or the ET since the last irrigation
- Know how much water was applied per acre based on one of the following:
 - a water meter,
 - an accurate measurement of the pump output per hour multiplied by hours run per acre,
 - an accurate measurement of sprinkler/low flow output per hour per acre, multiplied by hours run, or

- an accurate measurement of the turnout rate per hour, multiplied by hours run per acre

Restrictions on Engineered Rights of Way with GWPAs

“*Engineered rights of way*” means areas within a GWPA that are constructed in a way that results in increased collection and runoff of storm water, such as railroad ballasts and berms, public roadsides, and highway median strips or similar areas, but not canal or ditch banks or utility lines. Use of 6800(a) pesticides is prohibited on engineered rights-of-way in leaching or runoff GWPAs unless **one** of the following management options can be met and is designated by the commissioner on the permit:

- (a) Comply with any of the runoff GWPA management practices; **or**
- (b) Manage any runoff from the treated right of way so that it passes through a noncrop fully vegetated area adjacent, and equal in area, to the treated area, **or**
- (c) Comply with any permit issued pursuant to the storm water provisions of the federal Clean Water Act pertaining to the treated area. (3CCR section 6487.3 as amended by Enforcement Letter ENF 2005-006)

Alternative Management Practices or Interim Use Approved by the Director

In lieu of the management practices specified for runoff and leaching GWPAs, or for engineered rights of way within GWPAs, pesticide users may submit a request to the Director and the Director may approve alternative management practices, or interim use of 6800(a) pesticides with no ground water restrictions, under certain conditions. (3CCR sections 6487.3(d), 6487.4(h), and 6487.5(d))

Wellhead Protection

This provision applies to **all** pesticides mixed, loaded, rinsed, stored, etc.- (but not applied,

except as noted) around any type of well, including municipal, domestic, irrigation, drainage, abandoned, and monitoring wells. Wells are either protected from runoff or not protected from runoff.

(a) *Wells protected from runoff* must be sited so that runoff water from irrigation or rainfall does not move from the perimeter of the wellhead toward the wellhead and contact or collect around any part of the wellhead including the concrete pad or foundation. Alternately, wells must be protected from runoff by a berm constructed of any material sufficient to prevent movement of surface runoff water from the perimeter of the wellhead to the wellhead. Application of preemergent pesticides listed in section 6800(a) or (b) (<http://www.cdpr.ca.gov/docs/inhouse/calcode/040101.html#a6800>)

is prohibited between the berm and the wellhead; **or**

(b) *Wells not protected from runoff*. The following activities are prohibited within 100 feet of a well not protected from runoff:

- mixing, loading, and storage of pesticides.
- rinsing of spray equipment or pesticide containers.
- maintenance of spray equipment that could result in spillage of pesticide residues on the soil.
- application of a preemergent herbicide listed in section 6800(a) or (b). (3CCR section 6609 as interpreted in Enforcement Letter ENF 2005-24)

Additional Information

Additional information about the ground water protection program is available on the DPR website at:

<http://www.cdpr.ca.gov/docs/gwp/index.htm>

Questions should be directed to:

- the Environmental Monitoring Branch, DPR at (916) 324-4086.