

REQUEST FOR LEGAL SERVICES

Date: February 18, 2015
From: Gladys C. Baisa, Chair
Water Resources Committee

TRANSMITTAL

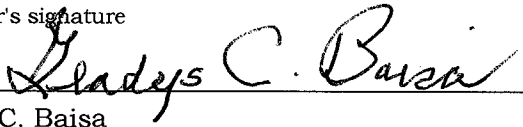
Memo to: DEPARTMENT OF THE CORPORATION COUNSEL
Attention: Edward S. Kushi, Jr., Esq.

Subject: WELLHEAD PROTECTION OVERLAY DISTRICT (WR-1)

Background Data: Resolution transmitting a draft bill relating to wellhead protection to the planning commissions for review and comment.

Work Requested: ☒ FOR APPROVAL AS TO FORM AND LEGALITY
☒ OTHER: Revise Section 19.94.060(B)(7) of Exhibit "A" to include a reference to

Appendix B.

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|---|---|
| Requestor's signature  Gladys C. Baisa | Contact Person <u>Kimberley Willenbrink</u> (Telephone Extension: <u>7761</u>) |
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☐ ROUTINE (WITHIN 15 WORKING DAYS) ☐ RUSH (WITHIN 5 WORKING DAYS)
☐ PRIORITY (WITHIN 10 WORKING DAYS) ☐ URGENT (WITHIN 3 WORKING DAYS)

☒ SPECIFY DUE DATE (IF IMPOSED BY SPECIFIC CIRCUMSTANCES): Tuesday, February 24, 2015 at 4:30 p.m.

REASON: For posting on the March 4, 2015 Committee agenda.

FOR CORPORATION COUNSEL'S RESPONSE

| | | |
|--------------|----------------|-----|
| ASSIGNED TO: | ASSIGNMENT NO. | BY: |
|--------------|----------------|-----|

TO REQUESTOR: ☐ APPROVED ☐ DISAPPROVED ☐ OTHER (SEE COMMENTS BELOW)
☐ RETURNING--PLEASE EXPAND AND PROVIDE DETAILS REGARDING ITEMS AS NOTED

COMMENTS (NOTE - THIS SECTION NOT TO BE USED FOR LEGAL ADVICE): _____

DEPARTMENT OF THE CORPORATION COUNSEL

Date _____

By _____ (Rev. 7/03)

wr:ltr:001acc01:kcw

Attachment

Resolution

No. _____

REFERRING TO THE LANAI, MAUI, AND
MOLOKAI PLANNING COMMISSIONS A
PROPOSED BILL AMENDING TITLE 19, MAUI
COUNTY CODE, RELATING TO WELLHEAD
PROTECTION

WHEREAS, the Council is considering a proposed bill to amend Title 19, Maui County Code, to add a new chapter 19.94 relating to a wellhead protection overlay district; and

WHEREAS, Sections 8-8.4 and 8-8.6 of the Revised Charter of the County of Maui (1983), as amended, require that the appropriate planning commissions review proposed land use ordinances and provide findings and recommendations to the Council; now, therefore,

BE IT RESOLVED by the Council of the County of Maui:

1. That it hereby refers a proposed bill entitled "A BILL FOR AN ORDINANCE AMENDING TITLE 19, MAUI COUNTY CODE, TO ESTABLISH A WELLHEAD PROTECTION OVERLAY DISTRICT"; a copy of which is attached hereto as Exhibit "A" and made a part hereof, to the Lanai Planning Commission, the Maui Planning Commission, and the Molokai Planning Commission, pursuant to Sections 8-8.4 and 8-8.6 of the Revised Charter of the County of Maui (1983), as amended;
2. That it respectfully requests that the Lanai Planning Commission, the Maui Planning Commission, and the Molokai Planning Commission transmit their respective findings and recommendations to the Council as expeditiously as possible; and
3. That certified copies of this resolution be transmitted to the Honorable Mayor Alan M. Arakawa; David Taylor, Director of Water Supply; the Lanai Planning Commission; the Maui Planning Commission; and the Molokai Planning Commission.

Resolution No. _____

APPROVED AS TO FORM AND LEGALITY

Deputy Corporation Counsel
County of Maui

wr:misc:001areso01:kcw

3/19/14 DRAFT

ORDINANCE NO. _____

BILL NO. _____ (2014)

**A BILL FOR AN ORDINANCE AMENDING TITLE 19, MAUI COUNTY CODE, TO
ESTABLISH A WELLHEAD PROTECTION OVERLAY DISTRICT**

BE IT ORDAINED BY THE PEOPLE OF THE COUNTY OF MAUI:

SECTION 1. Title 19, Maui County Code, is amended by adding a new chapter to be appropriately designated and to read as follows:

"CHAPTER 19.94

WELLHEAD PROTECTION OVERLAY DISTRICT

Sections:

- 19.94.010 Purpose and intent.
- 19.94.020 Definitions.
- 19.94.030 Applicability.
- 19.94.040 Wellhead protection overlay district zones and maps.
- 19.94.050 Regulations for Zone A.
- 19.94.060 Regulations for Zone B.
- 19.94.070 Regulations for Zone C.
- 19.94.080 Wellhead protection permits.
- 19.94.090 Best Management Practices.
- 19.94.100 Design guidelines.
- 19.94.110 Liability.
- 19.94.120 Interpretation of District Boundaries.
- 19.94.130 Enforcement.
- 19.94.140 Administrative Rules.
- 19.94.150 Severability.

19.94.010 Purpose and intent. Maui County recognizes that many residents rely on groundwater for their safe drinking water supply, and that certain land uses may contaminate groundwater sources. To ensure the protection of these drinking water sources, this ordinance establishes a zoning overlay district to be known as the Wellhead

Protection Overlay District ("WPOD"). The purpose and intent of the WPOD is to:

- A. Protect the public's health, welfare, and safety by minimizing the risks of contamination of aquifers;
- B. Preserve and protect existing and potential drinking water sources;
- C. Implement land use policies consistent with the Maui County General Plan and Community Plans; and
- D. Restrict and prohibit land uses that are incompatible with groundwater protection.

19.94.020 Definitions. The following definitions shall apply to this chapter. Terms not defined below shall have the meanings set forth in section 19.04.040 of this code, unless the context clearly indicates a different meaning:

"Confined animal feeding operation" means a lot or facility (other than an aquatic animal production facility) where animals will be stabled or confined and fed or maintained for a total of 45 days or more in any 12 month period, and where crops, vegetation forage growth, or post harvest residues are not sustained in the normal growing season over any portion of the lot or facility. Pasture operations are not confined animal feeding operations.

"Contamination" means an impairment of water quality by one or more of the regulated substances listed in Appendix A attached hereto.

"Dump" means a lawfully operated and privately owned refuse disposal site.

"Hazardous material" means substances that are identified as hazardous waste by the U.S. Environmental Protection Agency set forth in 40 CFR Part 261 Subpart D or identified as a hazardous substance designated by the U.S. Environmental Protection Agency pursuant to 40 CFR part 302.

"Integrated Pest Management" means a decision-making process that considers cultural, mechanical, biological and chemical controls of pests such as insects or rodents. Control mechanisms are selected as each situation warrants. Where chemical control is indicated, specific pest populations are targeted for treatment when they are most vulnerable rather than a general pesticide application.

"Landfill" means any sanitary landfill maintained and operated by the County.

"Primary Containment Facility" means a tank, pit, container, pipe or vessel containing a liquid or chemical that is not a secondary containment facility.

"Public Water System" as per the administrative rules of the State of Hawaii Department of Health (HAR 11-20-2), means a water system which provides water for human consumption, through pipes or other constructed conveyances if the system has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least sixty days out of any 12-month period. Such term includes: (1) any collection treatment, storage and distribution facility under control of the operator of such system, and (2) any collection or pretreatment storage facility not under such control which are used primarily in connection with such system.

"Regulated substances" means substances regulated under the National Drinking Water Regulations implementing the Safe Drinking Water Act or under the Rules Relating to Public Water Systems pursuant to Hawaii Administrative Rules Title 11 Chapter 20 and listed in Appendix A, attached hereto and incorporated herein by reference and may be amended in the same manner as any part of this chapter.

"Release" means any unplanned or unpermitted discharge, leak, or spill of a potential contaminant including a hazardous material.

"Secondary Containment Facility" means a second tank, catchment pit, pipe, or vessel that limits and contains liquid or chemical leaking or leaching from a primary containment area.

"Sewage sludge" means any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, industrial process, or air pollution control facility exclusive of the treated effluent from a wastewater treatment plant.

"Time-of-travel" ("TOT") distance means the distance that groundwater will travel in a specified time. This distance is generally a function of the permeability and slope of the aquifer.

"Wellhead protection area" means the surface and subsurface area surrounding a water well or well field that supplies a public water system, through which contaminants are reasonably likely to move toward and reach the water well or well field.

"Wellhead protection overlay district" (WPOD) means the zoning district consisting of the wellhead protection areas as identified on the maps entitled "Wellhead Protection Overlay District Zones", dated June 4, 2013, on file in the Office of the County Clerk with certified copies being placed on file in the Department of Planning and the Department of Water Supply.

19.94.030 Applicability. This ordinance shall apply to wellhead protection overlay district zones as defined herein for Department of Water Supply wells. Nonconforming uses as defined in

section 19.04.040 are subject to the provisions of section 19.500.110 of this code.

19.94.040 Wellhead protection overlay district zones and maps. WPOD zones are delineated by the University of Hawaii Department of Geology and Geophysics utilizing a fixed distance for Zone A nearest to the well, and TOT distance criteria for Zones B and C using the United States Geological Survey three-dimensional numerical groundwater model MODFLOW followed by a particle tracking program MODPATH. Zone B is intended to designate a conservative estimate of the area that may contribute bacteria and viruses to the wellhead. A two-year TOT criterion is based on survival times for bacteria and viruses in soil and groundwater. Zone C is based on a ten-year TOT to allow sufficient time to implement management and remedial measures to mitigate contamination from accidental contaminant spills and other causes.

A. The WPOD zones are superimposed on all current zoning districts and identified on the maps entitled "Wellhead Protection Overlay District Zones", dated June 4, 2013, on file in the Office of the County Clerk with certified copies being placed on file in the Department of Planning and the Department of Water Supply. Said Wellhead Protection Overlay District zone maps shall be deemed to be incorporated herein by reference, and may be amended in the same manner as any part of this chapter.

B. The WPOD zones are designated as follows:

1. **ZONE A** - 50 feet direct chemical contamination zone. Zone A is defined as the fixed 50-foot radius around each well. The purpose of this zone is to provide protection from vandalism, tampering, or other threats at a well site.

2. **ZONE B** - Indirect microbial contamination zone. Zone B consists of the surface area overlying the portion of an aquifer that contributes water to the well within two years..

3. **ZONE C** - Indirect chemical contamination zone. Zone C consists of the surface area overlying the portion of an aquifer that contributes water to the well within ten years.

19.94.050 Regulations for Zone A. Permitted uses: Necessary public utilities/facilities including the construction, maintenance, repair, and enlargement of drinking water supply-related facilities including but not limited to wells, pipelines, aqueducts, and tunnels.

19.94.060 Regulations for Zone B.

A. Permitted uses: All uses permitted in the underlying zoning districts, unless required to obtain a wellhead protection permit pursuant to subsection B below, or prohibited in subsection C below.

B. Permit required. The following uses in Zone B shall require a wellhead protection permit issued by the director of Water Supply pursuant to section 19.94.080.

1. Commercial automobile body/repair shops.

2. Car washes.
3. Cement/concrete plants.
4. Gas stations.
5. Fleet/trucking/bus terminals.
6. Dry cleaners.
7. Irrigated crops using soil fumigants (>50 acres) or pesticides rated by the U.S. Environmental Protection Agency as having high leachability potential.
8. Commercial machine shops.
9. Commercial wood preserving/treating facilities.
10. Confined animal feeding operations.
11. Commercial equipment maintenance/fueling areas.
12. Hospitals.
13. Parking lots/malls (>50 spaces).
14. Waste transfer/recycling stations.
15. All non-residential facilities involving collection, handling, manufacture, use, storage, transfer or disposal of more than 55 gallons of petroleum products or more than 10 gallons for any other regulated substance as defined herein.
16. Subdivisions that create three (3) or more residential or residential mixed use developable lots.

C. Prohibited uses. The following uses are prohibited within Zone B.

1. New cesspools.
2. Commercial electrical/electronic manufacturing facilities that utilize regulated substances as defined herein.
3. Mortuaries/graveyards.
4. Golf courses.
5. Commercial metal plating/finishing/fabricating facilities that utilize regulated substances as defined herein.
6. Commercial chemical processing/storage facilities.
7. Plastics/synthetic production facilities that utilize regulated substances as defined herein.
8. Commercial junk/scrap/salvage yards.
9. Mines.
10. Landfills/dumps.
11. Injection wells/dry wells/sumps on non-residential properties.
12. Irrigation with reclaimed wastewater classes R2 and R3.
13. Sewage sludge land applications.
14. Commercial slaughterhouses.
15. Wastewater percolation ponds.

19.94.070 Regulations for Zone C.

A. Permitted uses: All uses permitted in the underlying zoning districts, unless required to obtain a wellhead protection permit pursuant to subsection B below, or prohibited in subsection C below.

B. Permit required. The following uses in Zone C shall require a wellhead protection permit issued by the director of Water Supply pursuant to section 19.94.080.

1. Commercial automobile body/repair shops.
2. Gas stations.
3. Fleet/trucking/bus terminals.
4. Dry cleaners.
5. Golf courses.
6. Commercial machine shops.
7. Commercial wood preserving/treating facilities.
8. Confined animal feeding operations.
9. Commercial equipment maintenance/fueling areas.
10. All nonresidential facilities involving collection, handling, manufacture, use, storage, transfer or disposal of more than 55 gallons of petroleum products or more than 10 gallons of any other regulated substance as defined herein.
11. Subdivisions that create three (3) or more developable residential lots, including residential mixed use lots.

C. Prohibited uses. The following uses are prohibited within Zone C:

1. New cesspools.
2. Commercial electrical/electronic manufacturing facilities that utilize regulated substances as defined herein.
3. Commercial chemical processing/storage facilities.
4. Commercial plastics/synthetic production facilities that utilize regulated substances as defined herein.
5. Commercial junk/scrap/salvage yards.
6. Commercial metal plating/finishing/fabricating facilities that utilize regulated substances as defined herein.
7. Mines.
8. Landfills/dumps.
9. Injection wells/dry wells/sumps on non-residential properties.
10. Wastewater percolation ponds.

19.94.080 Wellhead protection permits.

A. Wellhead protection permit applications shall be submitted to the director of Water Supply, and shall include:

1. The name, address, and phone number of the applicant who will be responsible for implementation of best management practices;
2. Verification of property ownership; authorization by all property owners if the applicant is not the sole owner of the subject property.
3. The tax map key of the project site;
4. A plot plan showing the project location on the tax map key parcel;

5. A description of the proposed use, including names and quantities of any regulated substances collected, handled, manufactured, used, stored, transferred or disposed of at the project site;

6. A Best Management Plan addressing all activities subject to the Wellhead Protection Permit;

7. Additional information as may be requested by the director of Water Supply.

B. Permit processing.

1. Upon receipt of a complete application, the director of Water Supply shall approve or deny the application pursuant to the requirements of this chapter, and may impose conditions upon the proposed use to ensure that the purpose and intent of this chapter are met. If a complete application does not meet the requirements of this chapter, it shall be denied.

2. Initial permits shall be valid for a period of up to five (5) years. Subsequent permit renewals and permit amendments may be granted by the director of Water Supply for longer duration. In reviewing applications for renewals, the director of Water Supply shall require evidence of compliance with applicable best management practices and any other permit conditions.

3. All permits and renewals shall contain a provision for inspection at reasonable times and upon presentation of appropriate credentials.

C. Revocation and Appeal. Any wellhead protection permit may be revoked at any time and/or may not be renewed by the director of Water Supply if the permit terms and conditions have been violated or if the requirements of this chapter have not been met. Appeals of permit denials, revocations, non-renewals or alleging errors shall be heard and determined by the board of variances and appeals pursuant to chapter 19.520 of this code.

19.94.090 Best Management Practices. The following standards shall apply to uses in Zones B and C of any WPOD.

A. Any non-residential facility involving the collection, handling, manufacture, use, storage, transfer or disposal of more than 55 gallons of petroleum products or more than 10 gallons of any regulated substance as defined herein, must have a secondary containment system which shall be easily inspected and whose purpose is to intercept any leak or release from the primary containment vessel or structure.

B. Confined animal facilities shall meet the minimum requirements for operating a confined animal facility set forth in Department of Health "Guidelines for Livestock Waste Management dated January 19, 2010" as may be amended.

C. The irrigation of crops shall follow Integrated Pest Management in accordance with U.S. Department of Agriculture Natural Resources Conservation Service Technical Guide dated 1989, as may be amended.

D. Subdivisions that create three (3) or more residential or residential mixed use developable lots in unsewered areas resulting in septic systems that serve more than one residential unit per acre shall install aerobic treatment units or alternative treatment units achieving equal or higher level of wastewater treatment.

E. Parking lots shall be maintained on a yearly basis, including cleaning catch basins, and sweeping and sealing cracks. Runoff from parking lots should be diverted to storm water drains.

F. Waste transfer/recycling stations shall have an operating manual to insure that only clean, marketable recyclables are collected. Storage of residuals shall be accomplished to prevent spillage and leaking.

G. Golf course development shall meet best management practices for use of nutrients and pesticides as set forth in "Golf Course Management Measure", Hawaii's Coastal Nonpoint Pollution Control Program Management Plan, dated June 1996, as may be amended.

H. Construction activities shall be in accordance with chapter 20.08 of this code and these standards:

1. There shall be a designated person on site during operating hours who shall be responsible for supervising the use, storage, and handling of hazardous material and who shall take appropriate mitigating actions necessary in the event of fire or spill.

2. Hazardous materials left on site when the site is unsupervised must be inaccessible to the public. Locked storage sheds, locked fencing, locked fuel tanks on construction vehicles, or other techniques may be used if they will preclude access.

3. Construction vehicles and stationary equipment that are found to be leaking fuel, hydraulic fluid, and/or other hazardous materials shall be removed from the site and from any wellhead protection zone. The vehicle or equipment may be repaired in place, provided the leakage is completely contained.

4. Hazardous materials shall not be allowed to enter stormwater systems.

19.94.100 Design guidelines. A. The following design guidelines shall apply to subdivisions that create three (3) or more residential or mixed use developable lots.

1. Proposed development and uses should be located as far from the wellhead as feasible.

2. Storm-water infiltration basins should be located outside the WPOD where feasible.

3. Active parks and schools should implement Integrated Pest Management.

4. If development or use is proposed on property which is partially within a WPOD, the proposed development or use should be located to the maximum extent feasible on the portion of the property that is outside the WPOD.

19.94.110 Liability. Nothing in this ordinance shall be construed to imply that the County of Maui has accepted any of an

owner/developer's liability if a permitted facility or use contaminates groundwater in any aquifer.

19.94.120 Interpretation of District Boundaries.

A. If parts of a parcel lie within one or more of the delineated zones of the WPOD, the parts shall be governed by the restrictions applicable to the zone in which the part of the property is located.

B. Where the boundary between two WPOD zones passes through a facility, the entire facility shall be considered to be in the more restrictive zone.

C. Where the facility, or portion thereof, is overlapped by delineated zones of the WPODs of different wells or wellfields, the stricter zone(s) shall apply.

19.94.130 Enforcement. Any violation of this chapter shall be enforced pursuant to chapter 19.530 of this code, and through revocation or non-renewal as prescribed herein.

19.94.140 Administrative Rules. The Planning director and the director of Water Supply may adopt administrative rules regarding the administration of this chapter, pursuant to Chapter 91, Hawaii Revised Statutes.

19.94.150 Severability. Should any section or provision of this ordinance be declared invalid, such decision shall not affect the validity of the ordinance as a whole or any other part thereof. A determination that any portion or provision of this overlay protection district is invalid shall not invalidate any permit previously issued thereunder.

SECTION 2. This ordinance shall take effect upon its approval.

APPROVED AS TO FORM
AND LEGALITY:

EDWARD S. KUSHI, JR.
First Deputy Corporation Counsel

S:\ALL\ESK\Ords\Title 19, Chapter 19.24 Wellhead Protection Overlay District.wpd

Appendix A. REGULATED SUBSTANCES

| CONTAMINANT | CHEMICAL TYPE | SOURCE OF CONTAMINANT | CASRN |
|------------------------------------|--------------------|--|------------|
| 1,1,1,2-tetrachloroethane | Organic chemical | Industrial chemical used in the production of other substances | 630-20-6 |
| 1,1,1-Trichloroethane | Organic chemical | Metal degreasing sites and other factories | 71-55-6 |
| 1,1,2-Trichloroethane | Organic chemical | Industrial chemical factories | 79-00-5 |
| 1,1-Dichloroethylene (DCE) | Organic chemical | Discharge from industrial chemical factories | 75-35-4 |
| 1,2 Dibromo-3-chloropropane (DBCP) | Organic chemical | Soil fumigant, banned | 96-12-8 |
| 1,2,3-Trichloropropane (TCP) | Synthetic chemical | Industrial chemical used in paint manufacture | 96-18-4 |
| 1,2,4-Trichlorobenzene | Organic chemical | Textile finishing factories | 120-82-1 |
| 1,2-Dichloroethane | Organic chemical | Discharge from industrial chemical factories | 107-06-2 |
| 1,2-Dichloropropane | Organic chemical | Discharge from industrial chemical factories | 78-87-5 |
| 2,4,5-TP (Silvex) | Synthetic chemical | Residue of banned herbicide | 93-72-1 |
| 2,4-D | Synthetic chemical | Herbicide on row crops | 94-75-7 |
| Acrylamide | Organic chemical | Added to water during sewage/wastewater treatment | |
| Alachlor | Synthetic chemical | Herbicide on row crops | 15972-60-8 |
| Antimony | Inorganic chemical | Discharge from petroleum refineries, fire retardants, ceramics, electronics, solder | 7440-36-0 |
| Arsenic | Inorganic chemical | Runoff from orchards, glass & electronics production wastes | 7440-38-2 |
| Asbestos fiber > 10 microm. | Inorganic chemical | | |
| Atrazine | Synthetic chemical | Herbicide | 912-24-9 |
| Barium | Inorganic chemical | Drilling wastes, metal refineries | 7440-39-3 |
| Benzene | Organic chemical | Factory discharge, leaching from gas storage tanks and landfills | 71-43-2 |
| Benzo(a)pyrene | Synthetic chemical | Leaching from lining of water storage tanks and landfills | 50-32-8 |
| Beryllium | Inorganic chemical | Metal refineries, coal burning factories, electrical and defense industry | 7440-41-7 |
| Beta particles and photon emitters | Radionuclide | | |
| Bromate | | Byproduct of drinking water disinfection | |
| Bromodichloromethane | Trihalomethane | | |
| Bromoform | Trihalomethane | | |
| Cadmium | Inorganic chemical | Corrosion of galvanized pipes, discharge from metal refineries, runoff from waste batteries and paints | 7440-43-9 |
| Carbofuran | Synthetic chemical | Soil fumigant | 1563-66-2 |
| Carbon tetrachloride | Organic chemical | Discharge from chemical plants and other industry | 56-23-5 |
| Chlordane | Organic chemical | Residue of banned termiticide | 57-74-9 |
| Chlorite | | Byproduct of drinking water | |

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|---------------------------------|--------------------|---|------------|
| | | disinfection | |
| Chlorobenzene | Organic chemical | Discharge from chemical and agricultural chemical factories | |
| Chloroform | Synthetic chemical | | |
| Chromium | Inorganic chemical | Discharge from steel and pulp mills | 7440-47-3 |
| cis-1,2-Dichloroethane | Organic chemical | Discharge from industrial chemical factories, solvent for resins and fats, photography, photocopying, cosmetics, drugs, and as a fumigant for grains and orchards | |
| cis-1,2-Dichloroethylene | Organic chemical | Discharge from industrial chemical factories | 156-59-2 |
| Coliform | Microbe | | |
| Copper | Inorganic chemical | | |
| Coxsackieviruses | Enterovirus | Corrosion of household plumbing | |
| Cryptosporidium | Microorganism | Human and animal fecal waste | |
| Cyanide | Inorganic chemical | Discharge from steel/metal factories, plastic and fertilizer factories | |
| Dalapon | Organic chemical | Herbicide on right of way | 75-99-0 |
| Di(2-ethylhexyl)adipate | Organic chemical | Discharge from chemical factories | 103-23-1 |
| Di(2-ethylhexyl)phthalate | Organic chemical | Discharge from rubber & chemical factories | 117-81-7 |
| Dibromochloromethane | Trihalomethane | | |
| Dichloromethane | Organic chemical | Discharge from drug & chemical factories | 75-09-2 |
| Dinoseb | Organic chemical | Herbicide used on soybeans & vegetables | 88-85-7 |
| Dioxin (2,3,7,8-TCDD) | Synthetic chemical | Incineration of waste, discharge from chemical factories | 1746-01-6 |
| Diquat | Organic chemical | Herbicide | 85-00-7 |
| Endothall | Organic chemical | Herbicide | 145-73-3 |
| Endrin | Organic chemical | Banned insecticide | 72-20-8 |
| Epichlorohydrin | Synthetic chemical | Discharge from industrial chemical factories, impurity of some water treatment chemicals | |
| Ethelynedibromide (EDB) | Synthetic chemical | Discharge from petroleum refineries | 106-93-4 |
| Ethylbenzene | Synthetic chemical | Discharge from petroleum refineries | 100-41-4 |
| Fluoride | Inorganic chemical | Water additive, discharge from fertilizer and aluminum factories | 16984-48-8 |
| Giardia lamblia | Microorganism | Human and animal fecal waste | |
| Glyphosate | Synthetic chemical | Herbicide | 1071-53-6 |
| Gross alpha particle activity | Radionuclide | | |
| HAA5 (Haloacetic acids) | Haloacetic acids | Byproduct of drinking water disinfection | |
| Heptachlor | Synthetic chemical | Residue of banned termiticide | 76-44-8 |
| Heptachlor epoxide | Organic chemical | Breakdown of heptachlor | 1024-57-3 |
| Heterotrophic Plate Count (HPC) | Microorganism | HPC measures a range of bacterial that are naturally present in the environment | |
| Hexachlorobenzene | Organic chemical | Discharge from metal refineries and agricultural chemical factories | 118-74-1 |
| Hexachlorocyclopentadiene | Organic chemical | Discharge from chemical factories | 77-47-4 |

| | | | |
|---|-----------------------|---|------------|
| Inorganic Mercury | Inorganic chemical | Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands | |
| Lead | Inorganic chemical | Corrosion of household plumbing | |
| Legionella | Microorganism | Found naturally in water, multiplies in heating systems | |
| Lindane | Organic chemical | Insecticide used on cattle, lumber, gardens | 58-89-9 |
| Mercury (inorganic) | | Discharge from refineries, factories. Runoff from landfills and croplands | 7439-97-6 |
| Methoxychlor | Organic chemical | Insecticide used on fruits, vegetables, alfalfa, livestock | 72-43-5 |
| Monochlorobenzene | | | 108-90-7 |
| Naphthalene | Synthetic hydrocarbon | Manufacturing dyes, explosives, plastics, and lubricants. | |
| Nitrate (Nitrogen) | Inorganic chemical | Fertilizer use, septic tanks, sewage | 14797-55-8 |
| Nitrite (Nitrogen) | Inorganic chemical | Fertilizer use, septic tanks, sewage | |
| o-Dichlorobenzene | Organic chemical | Discharge from industrial chemical factories | 95-50-1 |
| Oxamyl (Vydate) | Organic chemical | Insecticide on apples, potatoes, tomatoes | 3135-22-0 |
| p-Dichlorobenzene | Organic chemical | Discharge from industrial chemical factories | 106-46-7 |
| Pentachlorophenol | Organic chemical | Discharge from wood-preserving | 87-86-5 |
| Picloram | Organic chemical | Herbicide | 1918-02-1 |
| Polychlorinated biphenyls | Organic chemical | Landfills, waste chemicals | 1336-36-3 |
| Radium 226, Radium 228 (combined) | Radionuclide | | |
| Selenium | Inorganic chemical | Petroleum and metal refineries, mines | 7882-49-2 |
| Simazine | Organic chemical | Herbicide | 122-34-9 |
| Styrene | Organic chemical | Rubber and plastic factories, landfills | 100-42-5 |
| Tetrachloroethylene | Organic chemical | Factories and drycleaners | 127-18-4 |
| Thallium | Inorganic chemical | Ore processing, electronics, glass and drug factories | 4770-28-0 |
| Toluene | Organic chemical | Petroleum factories | 108-88-3 |
| Total Coliforms (decal coliform, E. coli) | Microorganism | | |
| Total Trihalomethanes | Organic chemical | Byproduct of drinking water disinfection | |
| Toxaphene | Organic chemical | Insecticide used on cattle & cotton | 8001-35-2 |
| trans-1,2-Dichloroethylene | Organic chemical | Discharge from industrial chemical factories | 156-60-5 |
| Trichloroethylene (TCE) | Organic chemical | Metal degreasing sites and other factories | 79-01-6 |
| Turbidity | Microorganism | Human and animal fecal waste | |
| Uranium | radionuclide | | |
| Vinyl chloride | Hydrocarbon | Leaching from PVC pipes, discharge from plastic factories | 75-01-4 |
| Viruses (enteric) | Microorganism | Human and animal fecal waste | |
| Xylenes | Organic chemical | Petroleum and chemical factories | 1330-20-7 |

Appendix B: U.S. ENVIRONMENTAL PROTECTION AGENCY LIST OF HIGH-LEACHABILITY CHEMICALS THAT ARE PESTICIDES OF NATIONAL CONCERN

| Common Name | Brand/Other Name |
|--|--|
| Alachlor | |
| Acephate | |
| Acetochlor | Surpass, Fultime, Topnotch |
| Acifluorfen | |
| Aldicarb | Temik |
| Atrazine | Aatrex |
| Bentazon | Basagran |
| Azinphos-methyl | Guthion, azinphosmethyl, azinphos |
| Azoxystrobin | Azoxystrobin, Heritage, Amistar, Quadris, Bankit |
| Bensulfuron methyl | |
| Bispyribac-sodium | |
| Bromacil | Krovar, Hyvar |
| Carbaryl | Carbaryl |
| Chloropicrin | PS and nitrochloroform |
| Chlorothalonil | Bravo, Daconil, tetrachloroisophthalonitrile, Daconil, Celeste, Bronco, Agronil, Aminil |
| Chlorsulfuron | |
| Clomazone | Dimethazone |
| Cycloate | Dimethazone |
| Dacthal | Dacthal |
| 2,4-D, 2-ethylhexyl ester | |
| 2,4-D, diethanolamine salt | |
| 2,4-D, dimethylamine salt | |
| 2,4-D, isooctyl ester | |
| 2,4-DP-P, dimethylamine salt (dichlorprop-P, dimethylamine salt) | |
| Dazomet | Mylon; Basamid, Thiazone; Mylone; Tiazon; DMTT; Dimethylformocarbthialdine; Carbothialdin; Basamide; Nefusan |
| Diazinon | Diethoxy-[(2-isopropyl-6-methyl-4-pyrimidinyl)oxy]-thioxophosphorane |
| Dicamba, diglycolamine salt | |
| Dicamba, dimethylamine salt | |
| Dicamba | Dicamba |
| Dichlobenil | |
| Dichloran | |
| Diffufenzopyr, sodium salt | |
| Dimethenamid-P | Frontier Herbicide, Dimethenamid-P ((S)-isomer) ¹ |
| Dimethoate | O, O-dimethyl S-methylcarbamoylmethylphosphorodithioate Phosphorodithioic acid, O, O-Dimethyl S-(2-(methylamino)-2-oxoethyl)ester |
| Dinotefuran | RS)-1-methyl-2-nitro-3-[(tetrahydro-3-furanyl) methyl] guanidine; MTI-446 |
| Diquatdibromide | 1,1'-Ethylene-2,2'-bipyridyldiylm dibromide |
| Dithiopyr | |
| Diuron | Diuron, Karmex, Krovar |
| Endothall, dipotassium salt | |
| Endothall, mono (N,N-dimethyl alkylamine) salt | |
| EPTC | |
| Ethofumesate | |
| Ethoprop | |
| Fenoxycarb | Varikill, Insegar, Logic |
| Fludioxonil | |
| Flutolanil | |
| Fosetyl-Al (aluminum tris) | |
| Halosulfuron-methyl | |
| Hexazinone | Hexazinone, Pronone, Velpar |
| Imazamox, ammonium salt | |
| Imazapic, ammonium salt | |
| Imazethapyr, ammonium salt | |
| Imidacloprid | |
| Iprodione | Glycophene, Promidione |
| Isoxaben | Benzamizole, Flexidor, Gallery, X-Pand, Prolan |
| Lindane | Agrox, Kernal Guard, Lindane |

| Common Name | Brand/Other Name |
|-------------------------------|--|
| Linuron | Linex, Lorox |
| Malathion | 2-(dimethoxyphosphinothioylthio) butanedioic acid diethyl ester, Malathion, Carbofos, Maldison, Mercaptothion, Ortho malathion |
| Mefenoxam | |
| Metaaldehyde | 2,4,6,8-tetramethyl-1,3,5,7-tetraoxocanemetacetaldehyde |
| Metalaxyl | Allegiance, Apron, Gaucho, Raxil, Ridomil, Rival, Subdue |
| Methiocarb | Mercaptodimethur, Mesurol |
| Methomyl | Bluestreak, Deosect, Lannate, Mesomile, Methomex, Nudrin |
| Methyl isothiocyanate | MITC |
| Methyl parathion | E605 |
| Metolachlor | Drexel, Parallel, Bicep, Dual, Cinch, Lexar, Medal |
| (S)-Metolachlor | Dual, Pimagram, Bicep, CGA-24705, Pennant |
| Metribuzin | Axium, Metribuzin, Sencor |
| Napropamide | |
| Nitrapyrin | |
| Oryzalin | |
| Oxydemeton-methyl | Methylmercaptophos oxide |
| Penoxsulam | |
| Phorate | Thimet (trademark) |
| Picloram | Tordon, Grazon, Pathway |
| Piperonylbutoxide | |
| Prometon | Enforcer, Pramitol, Turf King |
| Prometryn | |
| Propanil | Propanide |
| Propyzamide | |
| Pyrazon | |
| Rimsulfuron | |
| Siduron | |
| Simazine | Pramitol, Princep, Simazine |
| Sulfometuron-methyl | |
| Tebuthiuron | Brulan; Brush Bullet; EL-103; Graslan; Perflan; Herbéc; Herbic; Reclaim, Spike, Sprakel |
| Terrazole | |
| Thiamethoxam | |
| Thiobencarb | |
| Thiophanate methyl | |
| Triallate | |
| Triclopyr, butoxyethyl ester | |
| Triclopyr, triethylamine salt | |
| Uniconazole-P | |
| Vinclozolin | Ronilan, Curalan, Vorlan, Touche, Vinclozoline |