



# FOCUS

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## Policy Options to Regulate Dioxins in Fertilizers

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### Dioxins in Fertilizers and Soils

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Ecology is committed to reducing dioxins in fertilizers. Calculations show that adding certain fertilizers to Washington's soils is likely to result in an increase in the amount of dioxins in the soils during our lifetimes. In addition, the U.S. Environmental Protection Agency's (EPA) 1999 draft *Risk Assessment of Contaminants in Agricultural Fertilizers* report concluded that while hazardous constituents in fertilizers generally do not pose harm to human health or the environment, fertilizers made from steel mill flue dust and liming agents made from wood ash with high levels of dioxins do pose some risk to farmers. This information convinced Ecology to explore options for reducing the amount of dioxins in fertilizers.

### Background Information:

#### Ecology's Rulemaking Efforts to Date

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During the last legislative session, Ecology committed to a rulemaking process to address dioxins in fertilizer. After researching the issue, Ecology solicited comments from industry and others on policy options for improving regulation of the three main wastes used in waste-derived fertilizers: steel mill flue dust (also called K061), cement kiln dust, and wood ash. Ecology Focus Sheets (publication numbers 99-1376, 99-1377, and 99-1378) explained the issues surrounding each waste and explored the policy options. A specific rule proposal was then developed. (see policy option#1) A second round of stakeholder meetings were held on the specific proposal .

After two rounds of stakeholder meetings, Ecology determined that a broader list of policy options should be offered for review. This Focus explains seven policy options and lists some key advantages and disadvantages for each option. Ecology is now soliciting input on this expanded list of options.

**November 1999**

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## Policy Options

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**Policy Option #1** – Set a “Non-degradation of soils” numerical dioxin standard

*The goal of this standard is to ensure that fertilizers added to the soils are not increasing the amount of dioxin already there.*

Fertilizers derived from dangerous waste must:

- Either not exceed 1.4 parts per trillion (pptr) dioxin, measured as toxic equivalent or "TEQ", or
- manufacturers must demonstrate use of best technology to reduce dioxin and show that the product is protective of soil over the long term

The 1.4 pptr standard is equal to Ecology's best estimate of the median dioxin content of Washington soils.

If this rule is adopted, home and garden fertilizer manufacturers whose product currently contains more than 1.4 pptr would either have to substitute a different micronutrient mix that contains a lower level of dioxins or choose not to sell their product in Washington. Producers of K061 fertilizers and most wood ashes are unlikely to be able to meet the 1.4 pptr standard. Instead, they will either have to demonstrate use of best technology to reduce dioxin and long term protection of the soils or choose not to sell their product in Washington. Exactly what is best technology has not yet been defined. However, some examples of best technology for pulp and paper mills that wish to land apply wood ash are: eliminate the use of salty hog fuel and wood wastes that are painted or mixed with plastics, separate bottom ash from fly ash, and then eliminate use of the fly ash for land application, and maintain high temperatures in the boilers.

One advantage of this approach is that it is based on Washington data. One disadvantage of this approach is that it will allow site specific soil concentrations to increase to a median level of 1.4 pptr.

Other variations of this option include:

- a) set a numerical standard higher or lower than 1.4 pptr;
- b) eliminate the best technology option and have only the numerical standard;
- c) only have the best technology option (no numerical standard);
- d) set different standards for agricultural fertilizer versus home and garden fertilizer products.



**Policy Option #2 - Develop Memoranda of Agreement (MOAs) with Fertilizer Manufacturers**

*The goal of this option is to address the concerns raised by pulp and paper companies that a specific dioxin standard may cause farmers or others to assume that they are liable for past practices of land disposal of wood ash.*

Currently, wood ash is excluded from the State of Washington Dangerous Waste Rules. If a dioxin standard is adopted, then wood ash that is above that standard would be considered a dangerous waste. Farmers may then be led to believe that they have applied dangerous wastes i.e., wood ash above the dioxin standard to their land in the past.

These voluntary agreements would be designed to reduce the amount of dioxin in fertilizer or wood ash manufacturers' products. For workload reasons, Ecology would probably want to have MOAs only with the major manufacturers of K061 fertilizers (there are two currently: one in-state and one out-of-state) and large producers of wood ash that land apply the ash (four total, two apply to their own land only). Many small hog-fuel boilers may also land apply wood ash. The MOA would have to include a numerical dioxin standard or a requirement for best technology, unless the MOA specified that K061 was prohibited for use as a fertilizer feedstock.

One advantage of this approach is that it may achieve maximum reduction at each facility. One disadvantage is that it would be difficult to develop MOAs with out-of-state companies. This could result in inconsistent standards.

Variations of this option include:

- a) develop an MOA with the producers of wood ash. A different approach with K061 fertilizer manufacturers may be necessary since one of the producers is an out-of-state firm; and
- b) tie these agreements to Ecology permits for in-state firms.

**Policy Option #3 – Prohibit Certain Feedstocks from Being Made into Fertilizer**

*The goal of this option is to ensure that no more dioxins are released into the environment by recycling dioxin-containing waste into fertilizers or liming agents.*

The Dangerous Waste Regulations would have to be amended to prohibit

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certain feedstocks, such as K061, wood ash, and perhaps cement kiln dust from being used in fertilizer products. Fertilizer manufacturers, when registering their products for sale in Washington State, would need to certify that their products do not contain certain feedstocks. This prohibition would only apply to fertilizer products sold in the state and would not prevent in-state K061 producers from selling K061 to fertilizer manufacturers, nor would it prohibit in-state fertilizer manufacturers from making a K061 fertilizer and selling it out-of-state.

Ecology would have to be prepared to periodically test fertilizers for dioxins, and potentially, challenge the certification of a particular product. Since Ecology does not know if other feedstocks contain dioxin or not, prior to rule adoption Ecology would have to test manufacturers' feedstock zinc fertilizers made from brass dust, and maybe other materials, to determine if other feedstocks besides the three mentioned above contain dioxins. If other feedstocks contain dioxins, they should also be prohibited from being made into fertilizer.

The advantage of this approach is that it results in the most conservative reduction (i.e., zero dioxin allowed). However, one disadvantage is that it doesn't necessarily address all potential dioxin sources, and therefore it makes a level playing field impossible to create because Ecology cannot identify all sources of out-of-state products.

#### **Policy Option #4 - Adopt Stricter Metals Standards For K061; No Action Regarding Dioxins**

*The goal of this option is to level the playing field by requiring all hazardous waste-derived fertilizers to meet the same metal standards. Its impact on dioxin levels in K061 is indirect.*

This option relies on a regulatory strategy to reduce metals levels and may have an additional benefit of reducing dioxin levels. Evaluation of this option focuses on K061 but it may have similar effect on other metal- and dioxin- containing wastes used to produce fertilizers.

In early 2000, Ecology will propose to remove the federal K061 exclusion and apply treatment standards to K061-derived fertilizers. Currently, under federal rules which Washington has adopted, K061 fertilizers do not have to meet the same standards as other hazardous waste-derived fertilizers. Removing the exclusion would result in K061 standards having to meet the same standards as other hazardous waste-derived fertilizers. In addition, Ecology will propose to apply treatment

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standards to "state-only" wastes used to make fertilizers. These rule proposals would create significantly more stringent metal standards for K061 and other waste-derived fertilizers than currently exist in the state. Fertilizers subject to the new standards will have to meet them or not be registered in the state.

Of the nine fertilizer products that contained more than 1ppt dioxin based on the 1997 and 1998 tests, the two with the highest levels of dioxin would also be subject to, and fail, the proposed metals standards. Both products are derived from K061. Data collected from a K061 manufacturer in Washington indicates a previously used manufacturing process cannot achieve the proposed metal standards. While currently not using K061, a manufacturer has been developing a new process that reportedly removes certain heavy metals from K061 during the fertilizer manufacturing process. Some of the dioxin, possibly 90 percent, may also be removed (according to the manufacturer). If the manufacturer decides to implement this new process in order to utilize K061, and it performs as expected, then dioxin reduction will be achieved through implementation of the metals standards alone.

While this approach does not eliminate all dioxin sources, it also does not create a precedent for a dioxin standard that may or may not be appropriate for other land-applied products.

#### **Policy Option #5** – Set Percent Reduction Dioxin Goal for Waste-Derived Fertilizers

*The goal of this option is to encourage reduction of dioxins without putting a standard in place that sets a precedent and causes comparison with other land applied products, such as biosolids, soil amendments, etc. where such a standard may not be appropriate.*

This option would set a dioxin reduction target for manufacturers of waste-derived fertilizers. Given the uncertainty of the best available technology and ways to reduce dioxins, this approach would set a percentage reduction target but allow each facility to demonstrate that it is doing the best reduction it can. It will be labor intensive for Ecology to create the criteria to verify that determination.

This approach allows for industry flexibility, which may result in maximum reduction at each facility. However, it would be difficult to potentially regulate out-of-state fertilizer manufacturers.

A similar option is to have a goal for all dioxin-containing fertilizers except those that have very minimal amounts. This "floor" level would

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have to be determined.

### **Policy Option #6** – Standard Based on EPA’s Risk Assessment

*The goal of this option is to set a standard based on a human health risk assessment to protect highly exposed individuals (in this case, farmers and fertilizer applicators).*

There are several assumptions involved with this option. EPA’s risk assessment concluded that dioxin in the soil at 8 ppt represented a 10-5 risk based on their model. Ecology may want to adopt a 10-6 risk level, which is more consistent with the level used for cleanup standards. If so, then the soil concentration would be .8 ppt. For example, the application of the fertilizer cannot cause the soil concentration to go above 0.8 over 100 years, assuming the starting concentration is zero. A maximum annual loading rate standard would be calculated based on this assumption. Compliance with the standard would be determined at the time of product registration, using the application rate and dioxin concentration. This is similar to the approach used for the Washington Fertilizer Standards for metals.

One of the main drawbacks of this option is disagreement regarding the assumptions used in a risk-based assessment. On the other hand, it results in a level playing field for all fertilizer manufacturers selling their products in Washington State.

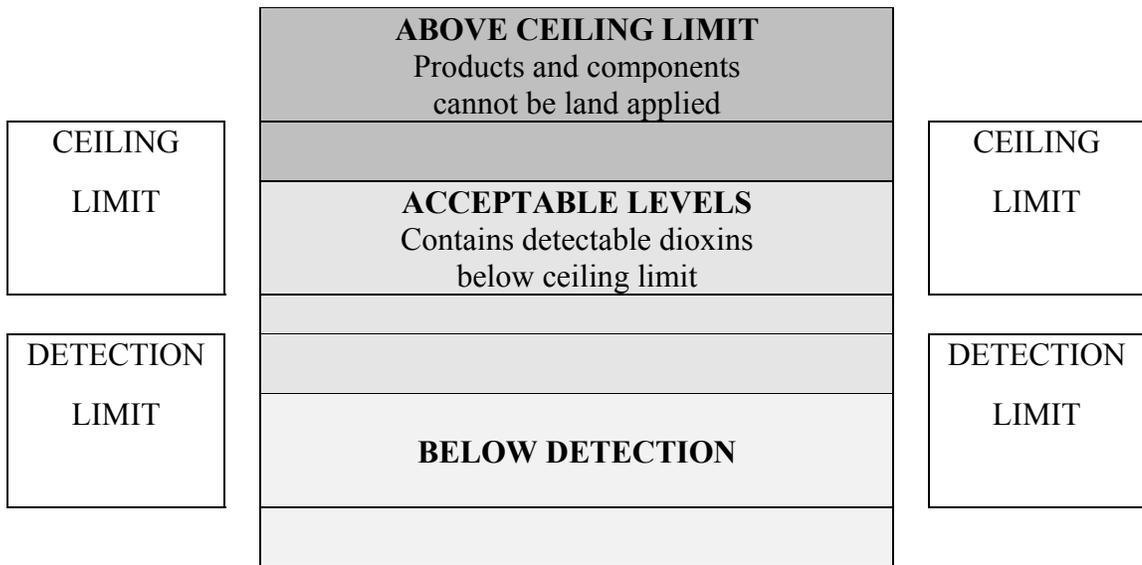
### **Policy Option #7** – Adopt Incentive-Based Tiered Limits Approach

*The goals of this option are to encourage all fertilizers to be dioxin-free, officially recognize those that are dioxin-free, and only prohibit land application of fertilizers that contain high levels of dioxins.*

This approach would set tiered limits for dioxin concentrations in materials to be land applied as well as substances used to manufacture products for land application.

These limits could be based on soil concentrations, risk-based, or a policy call.





**Ceiling Limit:** The maximum allowable concentration of dioxin in a product or component. Concentrations above this limit are considered unacceptable for land application or fertilizer component use.

**“Acceptable” Levels:** Products or components between “the ceiling limit” and “no detectable levels” require increased regulatory requirements. These requirements could be sampling and analysis, source analysis, pollution prevention plans, compliance schedules for reduction of dioxin, or other steps aimed at encouraging the generator to meet or fall below this threshold.

**No dioxin:** Products or components demonstrating no detectable level of dioxin would not be regulated and would receive some type of acknowledgement. For example, a declaration such as “This product meets the Washington State Department of Ecology requirements to be recognized as dioxin-free.”

This is a complicated approach which may be difficult to enforce for out-of-state firms. However, since this option is based on the 503 (biosolids) standards, some regulators and industries are very comfortable with this approach.

## **The Future:**

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## **Ecology's Decision-Making Process and Timeline**

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Ecology is soliciting input on these seven options over the next month. Ecology's preferred policy option(s) is scheduled to be publicized in December 1999 or January 2000. If Ecology decides to go with a regulatory approach, public hearings may be held in late March or early April 2000, with rule adoption planned for June. Any dioxin rule that may be proposed will not be part of the current process to amend the Dangerous Waste Regulations (proposal in January 2000), but instead will be a separate amendment on a separate timeline.

For additional information, please contact:

Chris Chapman at (360) 407-7160 ([ccha461@ecy.wa.gov](mailto:ccha461@ecy.wa.gov))

Dennis Bowhay at (509) 454-7866 ([dbow461@ecy.wa.gov](mailto:dbow461@ecy.wa.gov))

For more information on the overall revision to the *Dangerous Waste Regulations*, contact Chipper Hervieux at (360) 407-6756 ([pher461@ecy.wa.gov](mailto:pher461@ecy.wa.gov)).

If you need materials in an alternative format, contact Chris Chapman at (360) 407-7160 or (360) 407-6006 (TDD).

