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Assessing Environmental Impact Quotients for Pesticide Use on State Highways in Lane County

written by
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Oregon Toxics Alliance (OTA) is a statewide organization working for all Oregonians to expose root causes of toxic pollution and help communities find solutions that protect human and environmental health.

OREGON TOXICS ALLIANCE

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Purpose of the Report

The purpose of this report is to provide the Oregon Department of Transportation (ODOT) and Oregonians an initial assessment of the environmental impact of pesticide use on five state highways in Lane County: OR 36, 58, 126-W, 126-E and 569 (Randy Papé Beltway). The report provides the following data:

- Compare pesticide use on Lane County highways using ODOT Daily Spray Reports by computing miles sprayed, acres sprayed, and acres sprayed per mile.
- Measure the environmental impact of pesticide applications using the Environmental Impact Quotient of pesticides both individually and in the aggregate.
- Compare pesticide application trends across highways in Lane County and understand impacts of pesticides in rural versus urban areas.
- Make an initial assessment of the Pesticide Reduction Project on Highway 36.
- Respond to heightened public awareness of the ecological and health concerns of pesticide use.

Pesticide application, a conventional method of highway roadside maintenance, has been a topic of discussion and public comment at recent meetings of the Oregon Transportation Commission (OTC). The public has expressed concern that pesticide drift and run-off may be linked to significant water quality impacts and harm to wildlife, particularly endangered native salmon and trout. Oregonians are also alarmed that roadside applications may cause potential harm to unsuspecting drivers, bicyclists, children waiting at bus stops, and Oregonians who live, recreate and farm near state highways. Concerns have heightened in response to medical studies confirming that health risks can occur from pesticide exposure at levels previously considered below significant health thresholds.

OTC Chairperson, Dr. Gail Achterman, commented about pesticide use at a Commission meeting held on May 13, 2010. Her observations were directed at ODOT staff:

> "…I think the testimony on what the exposure is going to be for us if we continue to use [pesticides], both under the Clean Water Act and the Endangered Species Act, [indicates that] we're going to start running into real liability exposure on the continued use of these toxics, particularly as we learn more about their impact on listed species. So I think we've got to develop a much more aggressive plan to programmatically figure out how to reduce the amount that we use." *

This report is a method of gathering data to "programmatically figure out" the environmental impact of ODOT's pesticide use to develop strategies "to reduce the amount we use." One way to evaluate the efficacy of a protocol or program is measurement. This report uses an environmental indicator model called the Environmental Impact Quotient, developed by Dr. Joseph Kovach at Ohio State University. The Environmental Impact Quotient (EIQ) assesses the relative environmental impact of pesticide applications. An EIQ analysis can help state agencies identify pesticide application patterns that are potentially dangerous to the environment and people, and respond to the data by adjusting policies and protocols to reduce harm. EIQ models can also be used as a program evaluation tool to show differences in environmental risk between a strong IPM program and conventional pesticide use.

About Oregon Toxics Alliance

Oregon Toxics Alliance (OTA) is an environmental health non-profit chartered in the State of Oregon. Our mission is to expose root causes of toxic pollution and help communities find solutions that protect human and environmental health. OTA has been a partner to both Oregon residents and to the Oregon Department of Transportation (ODOT) regarding the assessment and mitigation of pesticide use on state highways.

* Footnote: See Appendix 7 for the full text of Dr. Gail Achterman's comments during the Oregon Transportation Commission meeting 5/13/2011

OTA has undertaken an Adopt-A-Landscape project on Highway 36 in Western Lane County in cooperation with ODOT District 2. The objective of the Highway 36 project is to manage twelve miles of highway without the use of pesticides to control invasive knapweed and some areas of blackberry and Scotch broom. The project started in October 2010 and will continue through October 2011, at which time we will assess the results. The Highway 36 project also serves as a model that other communities can duplicate. OTA also works closely with concerned residents in Lincoln, Josephine, Marion and Jackson counties on issues of roadside maintenance and pesticide reduction.

Executive Summary

This report uses Environmental Impact Quotient Field Use Rating to asses ODOT's pattern of pesticide use on Lane County state highways. The Environmental Impact Quotient Field Use Rating (FUEIQ) is a method of quantifying economic and environmental impacts of pesticide use. The FUEIQ data looks at modes of action, leaching, surface loss potentials (runoff), soil half-life data and risk to wildlife and humans to calculate the direct and indirect costs to society from pesticide use. The goal is to provide data-driven input into the development of balanced, rational policies that reduce the risks of pesticide use.

The OTA assessment resulted in these conclusions.

1. **Highway Ranking of Environmental Impacts:** The FUEIQ rating, which is the environmental risk analysis, provided data to rank the five highways in order of negative environmental impact:
   a. Randy Papé Beltway (highest level of impact)
   b. OR 58
   c. OR126-W
   d. OR 126-E
   e. OR 36 (lowest level of impact)

2. **Randy Papé Beltway carries the greatest risk of human and environmental harm:** The highest FUEIQ rating was on the Beltway, a 10-mile highway that runs through the Eugene urban core.
In other words, pesticide use has the greatest negative environmental impact on the highway serving the most heavily populated area. The number of sprayings each year is highest on Randy Papé Beltway. The total FUEIQ for the years 2007- 2010 for BeltHighway is estimated at 10,747 (three times higher than the lowest FUEIQ for OR 36 at 3,458).

3. **OR 36 Pesticide Reduction 2010 project shows lessened impacts:** The number of road miles and acres sprayed on OR 36 was lower in 2010, the year ODOT instituted a pesticide reduction project, than in all previous years. Also, the overall total environmental impact was reduced. However, the FUEIQ per acre sprayed, which reflects the average environmental impact per acre, remained about the same as previous years. The constancy of environment risk may be due to the toxicity of the pesticides used in 2010.

> *"Randy Papé Beltway carries the greatest risk of human and environmental harm ... In other words, pesticide use had the greatest negative environmental impact on the highway serving the most heavily populated area. "*

Recommendations:

It is recommended that ODOT take the following steps to minimize the environmental impact of conventional road maintenance operations:

1. Implement a pesticide reduction plan that follows principles of environmental stewardship, establishes targeted chemical reduction objectives, and measures progress towards meeting near-term and future pesticide reduction goals.

2. Adopt a policy of carrying out an annual environmental health impact assessment.

3. Establish human health protections as a priority, especially for children and individuals with disabilities and health impairments; start with policies to prevent pesticide use within 300 yards of schools, school bus stops, residences, hospitals, parks and bike paths.

4. Prevent pollutant loading by eliminating the use of pesticides in the vicinity of slopes, culverts and drainage ditches connected to or near wetlands,

streams and rivers, and establishing native plants along approaches to ramps and bridges.

5. Substitute mowing for pesticide applications on highway straightaways.

What is the Environmental Impact Quotient?

The Environmental Impact Quotient Field Use Rating, or FUEIQ, is a method of quantifying environmental impacts of pesticide use. This method of assessment was developed by Joseph Kovach, professor of entomology and Integrated Pest Management Coordinator at Ohio State University. [i, ii]

Using environmental indicator models to measure the environmental impact of pesticide applications involves extensive data management. FUEIQ Rating data looks at toxicity, leaching, surface loss potentials (runoff), and soil half-life data of approximately 100 compounds that are contained in the National Pesticide/ Soils Database developed by the USDA Agricultural Research Service and Soil Conservation Service. The tool also uses Material Safety Data Sheets and product labeling information provided by chemical manufacturers.

Kovach calculates the environmental impact quotient (EIQ) number for a particular pesticide's active ingredient by considering pesticide application rates, toxicology information for the pesticide's active ingredient, chemical parameter information (e.g., half-life) and health information (e.g., oncogenic effects) of the pesticide's active ingredient. In addition, some indicator models require weather and soil data in order to calculate potential leaching to the groundwater. The model produces a FUEIQ number. This is a "relative" number based on measuring the "impact potential of a specific pesticide on an individual environmental factor equal to the toxicity of the chemical times the potential for exposure." [iii]

The purpose of the Environmental Impact Quotient Assessment is to incorporate environmental impacts along with efficacy and cost into the pesticide decision-making process. [iv] It has been used to organize the extensive toxicological data available on common pesticides into a usable form for field assessment. It addresses a majority of the concerns including strategy, cost-effectiveness, and efficiency. Indirect costs of pesticide use including employee health and consumer exposure, as well as costs to wildlife, environmental health, and safety, can be illuminated.

Several benefits may be realized by performing a regular FUEIQ assessment, ranging from performing due deligence to improving sustainability performance.

Benefits may include:

- Promote productive dialogue with the public, and other state agencies.
- Communicate the agency's economic environmental, and social opportunities and challenges.
- Establish a quantified baseline of current performance in regards to social, economic and environmental sustainability in order to compare programs and monitor their progress over time.
- Stimulate sustainability discussions within the agency that may otherwise have not occurred, resulting in the ability to identify gaps and evaluate inconsistencies between the agency's objectives and program activities.
- Review legalities and policies to ensure that they are consistent and successfully met and do not contradict overall sustainability objectives.

"We recommend implementing a pesticide reduction plan that follows principles of environmental stewardship, establishes targeted chemical reduction objectives, and measures progress towards meeting near-term and future pesticide reduction goals."

TABLE 1. Field Use Environmental Impact Quotients for Five State Highways, 2007- 2010

		2007	2008	2009	**2010**	All years
69 (Papé Beltway)	Miles Sprayed	129.5	80.3	229.0	121.2	560.0
approx. 10 miles	Acres Sprayed	34.8	51.6	84.3	45.0	215.7
	Acres Sprayed per Mile	3.5	5.2	8.4	4.5	21.6
	FUEIQ x Acres Sprayed	334.5	2154.8	4881.1	3376.5	10746.9
	FUEIQ x AS per Mile	33.4	215.5	488.1	337.6	1074.7
	FUEIQ per Acre Sprayed	9.6	41.8	57.9	75.0	49.8
18 (OR 58)	Miles Sprayed	139.8	65.5	121.9	123.2	450.4
approx. 60 miles	Acres Sprayed	239.1	56.7	41.4	67.3	404.5
	Acres Sprayed per Mile	4.0	0.9	0.7	1.1	6.7
	FUEIQ x Acres Sprayed	4254.6	1369.8	511.4	638.6	6774.4
	FUEIQ x AS per Mile	70.9	22.8	8.5	10.6	112.9
	FUEIQ per Acre Sprayed	17.8	24.2	12.4	9.5	16.7
229 (OR 36)	Miles Sprayed	161.1	271.9	424.8	**220.1**	1077.9
approx. 53 miles	Acres Sprayed	70.2	122.5	91.2	**19.6**	303.5
	Acres Sprayed per Mile	1.3	2.3	1.7	**0.4**	5.7
	FUEIQ x Acres Sprayed	845.4	1325.0	1029.9	**257.6**	3457.9
	FUEIQ x AS per Mile	16.0	25.0	19.4	**4.9**	65.2
	FUEIQ per Acre Sprayed	12.0	10.8	11.3	**13.1**	11.4
15 (OR 126E)	Miles Sprayed	434.6	283.3	303.8	258.0	1279.7
approx. 56 miles	Acres Sprayed	145.7	139.0	87.0	133.7	505.4
	Acres Sprayed per Mile	2.6	2.5	1.6	2.4	9.0
	FUEIQ x Acres Sprayed	1204.3	1209.4	1151.6	1294.6	4859.9
	FUEIQ x AS per Mile	21.5	21.6	20.6	23.1	86.8
	FUEIQ per Acre Sprayed	8.3	8.7	13.2	9.7	9.6
62 (OR 126W)	Miles Sprayed	329.5	402.9	227.3	307.0	1266.7
approx. 56 miles	Acres Sprayed	265.9	214.3	85.1	123.0	688.3
	Acres Sprayed per Mile	4.7	3.8	1.5	2.2	12.3
	FUEIQ x Acres Sprayed	1583.3	1851.1	1068.2	1577.7	6080.3
	FUEIQ x AS per Mile	28.3	33.1	19.1	28.2	108.6
	FUEIQ per Acre Sprayed	5.4	8.6	12.6	12.8	8.8
All 5 highways	Miles Sprayed	1194.5	1103.9	1306.8	1029.5	4634.7
approx. 235 miles	Acres Sprayed	755.7	584.1	389.0	388.6	2117.4
	Acres Sprayed per Mile	3.2	2.5	1.7	1.7	9.0
	FUEIQ x Acres Sprayed	8222.1	7910.1	8642.2	7145.0	31919.4
	FUEIQ x AS per Mile	35.0	33.7	36.8	30.4	135.8
	FUEIQ per Acre Sprayed	10.9	13.5	22.2	18.4	15.1

(1) FUEIQ x Acres Sprayed is the sum of Environmental Impact Quotient Field Use ratings (FUEIQ) for each product times the number of acres sprayed with that product.
(2) Acres Sprayed per Mile is Acres Sprayed (2nd row) divided by highway length in Lane County.
(3) FUEIQ per Acre Sprayed is the average FUEIQ for all acres sprayed (FUEIQ x Acres Sprayed [4th row] divided by Acres Sprayed [2nd row]).
(4) FUEIQ x AS per Mile is FUEIQ x Acres Sprayed (4th row) divided by highway length.

General Discussion

In Table 1, environmental impact values have been computed for five highways in Lane County. The values were calculated by reviewing four years of ODOT's Daily Spray Reports.* These reports provide information on products, chemical names, additives, location, acres sprayed, miles sprayed, area sprayed, rate of application, quantity, spray time, temperature and targeted plant type, and other data. For the purpose of assessing the environmental impact of the pesticide use as reported on Daily Spray Reports, FUEIQ values were derived for three indicators: FUEIQ times Acres Sprayed (overall impact); FUEIQ times Acres Sprayed per Mile (average impact based on highway length); FUEIQ per Acre Sprayed (average impact). By applying the FUEIQ Rating, comparisons can be made between different vegetation management strategies per highway and across highways. The data is arranged to show comparisons over time and in the aggregate for the four year period 2007-2010.

There is great variability in the calculation due to the wide range of FUEIQ ratings. For example, the FUEIQ for aminopyralid is 22.67; for diuron the FUEIQ is 169.40. The rating indicates that diuron is much more toxic in the environment and damaging to people than is aminopyralid, so that even small amounts can be potentially quite harmful. Occasional use of diuron markedly increases the apparent impact of spraying, (e.g., Beltway in 2008, 2009, and 2010).

As an example (not actual numbers from daily spray reports):

Pesticide	FUEIQ	Acres Sprayed	FUEIQ Sprayed x Acres
Sulfometuron Methyl	2.8	20	56.0
Glyphosate	24.7	2	49.4
Diuron	169.4	0.25	42.4
Sums:		22.25	147.8

Thus, the high impact of a particular spraying can be due either to a high FUEIQ (diuron) or to a high number of acres sprayed (20). In this example, the overall impact of pesticides for this hypothetical length of highway is 147.8.

Comparisons Across Years, all 5 highways, from 2007 to 2010:

- The total number of miles sprayed on an annual basis has remained about the same over the four years (ranging from the lowest total of 1029.5 miles in 2010, to the highest total of 1306.8 miles in 2009).
- The number of acres sprayed has decreased about 49% (from 755.7 in 2007 to 388.6 in 2010).
- The total sum of the overall environmental impacts, calculated as the FUEIQ x acres sprayed, decreased only slightly, about 13% (from 8218.1 in 2007 to 7120.6 in 2010.)
- The average environmental impact per acre, calculated as the FUEIQ per acre, increased by 150% (from 10.9 in 2007 to 18.3 in 2010).

Comparisons Across the 5 Highways:**

1. The number of sprayings each year is highest on Randy Papé Beltway, lowest on OR 58, and intermediate on the other highways.

OR 58	about 1 time each year
Beltway	4 to 6 times a year
OR 126W	2 to 3 times a year
OR 126E	2 to 4 times a year
OR 36	2 to 4 times a year

2. The number of Acres Sprayed per Mile of highway is highest on Randy Papé Beltway.

3. FUEIQ x Acres sprayed is an indication of the *overall impact* of pesticides for an entire highway. This can be obtained by multiplying the FUEIQ for each pesticide times the number of acres sprayed with that pesticide and then summing these products for the entire highway.

* Footnote: See Appendix 6A for an example of a page from an ODOT Daily Spray Report and 6B for an example of the Daily Spray Report Chemical Subtotals.

** Footnote: These numbers are not shown on the summary page, but can be easily estimated by dividing Miles Sprayed by the length of the highway.

Using the FUEIQ x Acres Sprayed as an indicator, the *overall impact* of pesticides during the period from 2007 to 2010 is highest for Randy Papé Beltway (10,721.0) and lowest for OR 36 (3,432.3).

4. A second indication of the impact of pesticides can be obtained by dividing the FUEIQ x Acres Sprayed by the number of Acres Sprayed, to yield an *average* FUEIQ per Acre Sprayed. (In the example above, 147.8 divided by 22.25 yields an FUEIQ per Acre Sprayed of 6.6.)

Using the FUEIQ per Acre Sprayed as an indicator, the *average impact* of pesticides during the period from 2007 to 2010 is highest for the Randy Papé Beltway (49.7) and lowest for OR 126W (8.7). The other impacts in order: OR 126E (9.4), OR 36 (11.3), and OR 58 (16.7).

5. A third indication of the average impact of pesticides based on highway length can be obtained by dividing the FUEIQ x Acres Sprayed by the number of miles of highway. (In the example above, suppose the highway is 38 miles long; Dividing 147.8 by 38 yields 3.9.)

Using FUEIQ x Acres Sprayed per Mile as an indicator, the average impact of pesticides during the period from 2007 to 2010 is highest for Randy Papé Beltway (1072.1), intermediate for OR 58 (112.8), OR 126W (107.3), and OR 126E (85.1), and lowest for OR 36 (64.8).

Highway 229 (OR 36)

1. The number of miles sprayed averaged about 216 miles in 2007 and 2008, but was almost twice as high in 2009 (424.8 miles); in 2010 the number of miles sprayed returned to approximately the earlier average (220).

2. The number of acres sprayed was much lower in 2010 (19.6) than in previous years.

3. The number of acres sprayed per mile of highway was much lower in 2010 (0.4) than in previous years.

4. The *overall impact* of pesticides for this highway (FUEIQ x Acres Sprayed) was lower in 2010 (257) than in previous years. It was also lower than for all other highways.

5. The FUEIQ x AS (Acres Sprayed) per Mile of highway for OR 36 was much lower in 2010 (4.9) than in previous years. It was also lower than for the other highways.

6. The *average* environmental impact *per acre*, calculated as FUEIQ per Acre Sprayed, was as high, and in fact, slightly higher, than in previous years (FUEIQ = 12 in 2007 and 13.1 in 2010), the year ODOT began the 2010 Integrated Vegetation Management project.

It appears, therefore, that the reduction in *overall* impact of pesticides in 2010 for highway OR 36 reflects primarily the spraying of fewer miles and acres. However, the toxicity and environmental impact of pesticides per acre, in other words the *average* impact per acre, was not reduced over the four years.

The reduced overall impact is also an outcome of the Adopt-A-Highway partnership between ODOT and Oregon Toxics Alliance. In fall, 2010, OTA and nearby residents adopted twelve miles of highway near Triangle Lake School to maintain as pesticide free. OTA uses mechanical methods to remove invasive weeds. ODOT provides one additional mowing per year, as well as cones, safety vests and plastic sacks for bagging weeds that were cut or dug out.

Human Rights and the Use of Pesticides on State Highways

Some herbicides used by ODOT are known to cause adverse respiratory, neurological and endocrinological effects. Taking responsibility for exposing virtually all Oregon residents to these chemicals must be a prioritized concern of our state government.

> "The use of toxics and large scale contamination of air and water is more than an environmental problem and more than a public health problem. It is a moral problem. Formal human rights documents declare that persons have moral rights -- and governments have moral duties -- and that one of the most basic is the right to a clean and healthful environment.

> "Human rights are rights of individuals; i.e., they apply to each single person. Further, they are basic ethical minimums, a moral floor below which governments should not go. The right *not* to be exposed to neurotoxicants by one's own government is not a high, virtuous ideal, but is a basic ethical minimum."
>
> -- Dr. Tom Kerns, Environment and Human Rights Advisory

The concern for the right to be protected from toxic trespass is even more critical with children and fetuses than adults. Children face unique and magnified hazards from pesticide exposure due to their small size, tendency to engage in activities on or near the ground, greater intake of air relative to body weight, developing organ systems, and other distinctive characteristics. [v] Children have fewer natural defenses and can develop serious health effects if exposed to pesticides. The rapid changes in their organ and neurological systems often make children more sensitive to toxic exposure because their brain and nervous systems are at early critical developmental stages. The U.S. EPA, National Academy of Sciences, and American Public Health Association, among others, have voiced concerns about the dangers that pesticides pose to children. [vi] The body of scientific evidence shows that pesticide exposure can adversely affect a child's neurological, respiratory, reproductive, immune, and endocrine systems, even at low levels. Being exposed to pesticides can cause or exacerbate asthma symptoms and such exposures have been linked to cancer.

> "For children, the stage in their development when the exposure occurs may be just as important as the magnitude of exposure.… Examples have shown that exposures to the same environmental chemical can result in very different health outcomes in children compared with adults. Some of these outcomes have been shown to be irreversible and persist throughout life. Furthermore, different organ systems mature at different rates, and the same dose of an agent during different periods of development can have very different consequences. There may also be a long latency period between exposure and effects, with some outcomes not apparent until later in life."
>
> -- World Health Organization, 2006 [vii]

Maintaining a moral standard for pesticide use based on human rights is imperative for the health of children. A child's healthy and normal development depends on decisions made by adults and actions taken by institutions and governments.

As described in the EHRA report on roadside sprays and Human Rights, the consequences of governments ignoring human rights norms are not insignificant. Loss of public confidence in government agencies and their processes is not a small thing, even from the perspective of the agency, and even when viewed through the lens of basic practicality. When human rights standards are compromised the consequences can be monumental, costly and long lasting. If ODOT made no improvements, there would be risk of public recognition that, despite awareness of links between herbicide exposure and health impacts and awareness of human rights concerns, the State did nothing to modify herbicide practices. [viii]

Human rights to security of person, to health, to inviolability of the home, to a healthy environment, and the right of mothers and children to special consideration have been formally articulated in documents such as the ***Universal Declaration of Human Rights***, the ***Convention on Economic, Social and Cultural Rights***, the ***Convention on the Rights of the Child***, and others. These documents have been signed and adopted by governments all over the world.

These human rights norms are basic, minimum ethical standards of conduct that all citizens should be able to expect from their governments. Yet these rights are abridged when a government fails to adequately regulate in ways that protect individuals, families and children from non-consensual exposures to environmental toxics.

The Oregon Toxics Alliance commissioned a human rights assesssment for ODOT Roadside Spray in 2008. Access at: http://oregontoxics.org/spp/resources. See Appendix 8 for an Executive Summary.

Conclusions

This report attempts to provide an "input and outcomes" assessment of pesticide use on state highways in Lane County. Assessments provide data by which to judge program efficiency, programatic value, cost effectiveness, and environmental impact. Without ongoing empirical assessments, state agencies and the public are unable to measure the impact of their policies and the progress towards environmental health and highway safety goals. A public agency should be accountable to identify gaps and evaluate inconsistencies between the Agency's objectives, program activities, and reports with internal organization and policies.

Urban Highways: The highest FUEIQ rankings identify Randy Papé Beltway as the area receiving the greatest chemical impact from toxicity, frequency of application and environmental impacts of pesticides. This report suggests that ODOT should re-evaluate their use of pesticides on Randy Papé Beltway taking into account that the Beltway is located in a heavily populated area. The public can be exposed to frequent sprays of highly toxic chemicals from:

- car ventilation
- open windows
- biking and walking on adjacent public paths
- living in a residence next to the highway
- working in a business next to the highway
- pesticide residuals that move away from the spray area by drift, vaporization or leaching

There are sections of Randy Papé Beltway and urban portions of OR 126-E that cross the Willamette River. This transportation corridor also runs adjacent to wetlands in its central and the western portions. There should be concern about pesticide run-off into these important surface water areas. The use of pesticides on surfaces adjacent to the Willamette River and nearby hydrologically-related wetlands appears to be out of alignment with ODOT's NPDES permit requirement and commitment to the Oregon Plan for Salmon and Watersheds. This Plan requires ODOT to implement Best Management Practices to reduce "illicit discharges" and "reduce pollutant loadings to the maximum extent practical in storm water run-off from ODOT facilities." Specifically, ODOT is charged with "reducing chemical use and protecting water quality."

Weeds that have died as a result of herbicide spray still remain on the roadside right-of-way. Dry, deadened vegetation is a fire hazard and an eyesore. This is especially true of dead grasses along straightaways, and on-ramps and off-ramps. Dead brush is problematic and requires removal, usually by mowing. The use of herbicide spray to kill unwanted vegetation does not alleviate the need to remove the vegetation. ODOT's procedure is to mow after the initial herbicide spray to remedy the problem. Weeds that were sprayed and killed at the start of the growing season do not deter the growth of new weeds a few weeks later in the season. This creates a situation where new weeds are growing up through the dead vegetation. Most of these weeds will be invasive non-natives, hardy enough to grow in the inhospitable dry, chemically-treated soil. Applying pesticides to kill the second growth creates a cycle of spraying that does not address the problem.

Rural Highways: Rural highways can also benefit from an environmental impact quotient analysis. For example, ODOT initiated a pesticide reduction project on OR 36 in 2010. The project resulted in fewer acres and fewer miles sprayed. However, the average environmental impact (measured as FUEIQ per acre sprayed) did not improve and remains higher on OR 36 (12.4) than on OR 58 (9.6) in the year 2010. This is true despite the fact that OR 58 is about seven miles longer in length. This comparison indicates that, while fewer acres and miles were sprayed in 2010, the overall environmental toxicity of pesticide application remained unchanged from the years prior to the pesticide reduction project. Working together with interested parties such as Oregon Toxics Alliance, ODOT can further reduce miles and acres sprayed, and mitigate environmental impacts by using alternative methods to control targeted weed species.

Recommendations

Reducing pollutant loading in the environment and evaluating progress over time

The agency is to be commended for acknowleding that "due to continued pressure in regards to the use of herbicides in ODOT's vegetation management program, ODOT is implementing plans to reduce the amount of herbicides used to manage the highway for safety and for structure preservation, and evaluate how that reduction affects highway management." [ix]
In the 2011 publication, Integrated Vegetation Management Program, ODOT states that the agency has intentionally reduced pesticides statewide by 26% during the 2004-2009 years. The agency has also identified a goal of a statewide 25% reduction in herbicides by the year 2015. We support the direction of the agency's goal and further recommend that conducting an FUEIQ analysis will help ODOT fully assess their ability to meet pesticide reduction and environmental protection goals. We recommend a level of evaluation that provides replicable, comparative and consistent monitoring to accurately measure reductions in pollutant loading, drift and run-off. To date, ODOT's program evaluation has tended to focus on a discussion of "challenges" to IPM implementation. More productive would be a description of steps ODOT plans to take to expand and improve environment and human health protections.

OTA recommends three steps ODOT can take to reduce pesticide exposures and pollutant loading in surface waters and soils:

1. **Pollution Reduction:** The most effective way to protect human health and the environment is to prevent pollutants from getting into the environment, rather than mitigating or managing the risks after the pollutant has been released into soil, water and air. Pollution prevention must be emphasized. This can be accomplished through a goal-based Integrated Vegetation Management Policy and Program that prioritizes chemical reduction, lowest-toxicity products, buffer zones around surface waters, protecting wildlife, mowing, native replantings and rethinking the aesthetics of highway management.

As a first priority, ODOT should implement a measurable pesticide reduction plan for highways in river corridors such as the McKenzie, Willamette and Siuslaw Rivers. Pesticides must not be sprayed near culverts and drainage ditches that are connected with wetlands, streams and rivers. ODOT must increase resources for replanting native species along approaches to ramps and bridges after the removal of invasive species. Mowing can replace all pesticide applications on straightaways.

2. **Protecting the Health of Children and Vulnerable Populations:** ODOT must develop policies to prevent all uses of pesticides within 300 yards of schools and day care centers, hospitals, residences, businesses, bike paths, school bus stops, churches and community centers. ODOT should increase funding for pesticide reduction partnerships with rural community and civic organizations along the same model as the OR 36 No-Spray project.

3. **Verifiable Measurement Combined with Goals of Reducing Environmental Impacts:** ODOT should use the FUEIQ measurement system to evaluate the environmental impact results of their roadside maintenance policies. Looking across the years 2007 – 2010, the data indicate that the average environmental impact from pesticide spray remains about the same. As a result, human health impacts, water quality impacts, and ongoing environmental damage have not actually decreased, despite an apparent reduction in the amount of chemical applied on highways. Instituting an FUEIQ assessment, verification and evaluation can help ODOT identify gaps and evaluate consistencies between the agency's stated objectives and actual program implementation.

In its 1998-1999 National Pollutant Discharge Elimination System Annual Report, ODOT set a goal to "modify landscape requirements for various land uses to encourage self-sustaining vegetation which reduces the need for pesticides, herbicides, fertilizers and water." [x] An activity listed under this goal is to "initiate multiple IPM research projects that will investigate the impacts of ODOT's use of pesticide, herbicides, fertilizers on waterways."

The agency further recommended that it initiate a stakeholder process (which would be anticipated to include the public as consistent and concerned users). However, in Appendix D of the report, the Integrated Pest Management program is identified as a "deleted" program. The reason given is that it is redundant with the State Agency IPM program. However the State Agency Integrated Pest Management Coordinating Committee was dissolved in 2001 (see Chapter 413 Oregon Laws 2001).* We urge ODOT to re-instate the original workplan.

Among state agencies, ODOT is to be credited with initiating an agency response to develop an IPM program. We look to ODOT to prioritize the policy direction and resources necessary to "reduce pollutant loading to the maximum extent possible," a stated objective of the fourteen year old report. In light of public concern about pesticide use and mounting scientific evidence of harm, it is incumbent upon ODOT to develop Best Management Plans for roadside maintenance that are responsive to the values of human rights and environmental protection.

We welcome ODOT's leadership to meet Oregon's goals of reducing environmental loading of hazardous and toxic substances. We offer this report in the spirit of collaboration towards the advancement of environmental health and the public good.

Citations

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[ix] ODOT Integrated Vegetation Management Program, April 2011 (access at http://www.oregon.gov/ODOT/HWY/OOM/docs/IVM_program_summary.pdf on 7/15/2011).

[x] 1998 National Pollutant Discharge Elimination System Annual Report, Oregon Department of Transportation (access at http://www.portlandonline.com/bes/index.cfm?a=80751&c=38509 on 7/18/2011).

* Footnote: It should be noted that the State Agency Integrated Pest Management Coordinating Committee was dissolved in 2001 (see Chapter 413 Oregon Laws 2001).The absence of a State IPM Coordinating Committee and a comprehensive IPM policy leaves state agencies without coordination and tools to effectively reduce the environmental and health impacts of pesticides on state property.

Appendix 1. **Highway On-Ramps and Off-Ramps**

1A. **ODOT Vegetation Management Practices**
Location: Beltline Off-Ramp to intersection of Delta Highway (6/28/2011)
Notes: a) Entire area was sprayed; b) New weeds growing up through dead vegetation; 3) Human exposure pathways via sidewalk, bikepath, open car windows, ventilation systems, and drift to nearby business area.

1B. **Lane County Public Works "Pesticides as a Last Resort" Vegetation Management**
Location: Entrance to Delta Highway via Valley River Center Off-ramp (6/28/2011)
Notes: a) The area was not sprayed; b) No dead vegetation – natural greenery in urban area; 3) No human exposure pathways.

Appendix 2. **Guard Rails**

2A. **ODOT Guardrail Treatment Area on Scenic Rural Hghway**
Location: Highway 36 near Lake Creek, Western Lane County (7/2011)
Notes: a) Spray in and around guardrail near creek close to Cheshire; b) Dead vegetation is an eyesore and a fire hazard; c) Dead vegetation must still be removed manually; d) Environmental pollution through run-off to creek and soil contamination.

2B. **Oregon Toxics Alliance Highway 36 No Spray 12-Mile Project**
Location: Side of roadway with Lake Creek to the left (7/2011)
Notes: a) Driver safety and guard rail visibility is maintained; b) Ferns, maples and foxglove outcompete invasive weeds; c) Maintains scenic beauty of highway.

2C. **ODOT Vegetation Guard Rail Management Practices**
Location: Beltline Hwy near Coburg Rd. (7/2011)
Notes: a) Dead vegetation surrounds guard rail;
b) Invasive blackberry starting to grow up through sprayed vegetation; c) Human exposure routes through open car windows, ventilation systems, and drift to nearby businesses.

2D. **Lane County Public Works "Pesticides as a Last Resort" Guard rail Management**
Location: Delta Highway near Valley River Center (6/28/11)
Notes: a) Native wildflowers grow without compromising driver visibility or safety; b) Common weeds keep soils in place and outcompete invasive species; c) No risk of pesticide exposure to nearby residents.

Appendix 3. **Near Schools and Bus Stops**

3A. **ODOT Vegetation Management includes spraying along school bus stop area**
Location: Near Pudding River along Hwy 211 (5/2009)
Notes: 1) Brownish vegetation near sign shows spray area; 2) Spray is for common weeds, however invasive blackberries were not controlled; c) Human exposure through contact on shoes/ clothing from walking in the area as well as open car windows, ventilation systems, and drift.

3B. **Oregon Toxics Alliance Highway 36 No Spray 12-Mile Project**
Location: 1/4 mile from Triangle Lake School (10/2010)
Notes: a) Manual removal protects nearby students and integrity of highway near school zone; b) Only invasive plants are removed, leaving native vegetation and soils intact; c) No risk of pesticide exposure to nearby school children, travelers and residents.

3C. **Twin Oaks School Zone on Lorane Highway, Lane County No Spray IVM (school is white building in upper left)**
Location: 1/4 mile from Twin Oaks School (8/2011)
Notes: a) County manual removal policy (mowing) protects integrity of highway near school zone; b) No risk of pesticide exposure to school children using playground and ball fields, and nearby church.

Appendix 4. **Near Rivers and Drainages**

4A. **ODOT Vegetation Management Practices for Rural Highways in Oregon Watersheds**
Location: Hwy 36 with Lake Creek to the right (10/2009)
Notes: a) Large width of spray area is directly on banks of Lake Creek, a tributary to the Siuslaw River and a protected salmon habitat; b) Paths of environmental exposure through surface water run-off, migration through soils and drift.

4B. **Oregon Toxics Alliance Highway 36 No Spray 12-Mile Project**
Location: Hwy 36 with Lake Creek to the right (7/2011)
Notes: a) Native vegetation is maintained as a protection and filtration area; b) No risk of pesticide run-off causing pollutant loading in Lake Creek or the Siuslaw Watershed.

4C. **ODOT Vegetation Management Practices for Rural Highways in Oregon Watersheds**
Location: Crossing the Pudding River along Hwy 211 (5/2009)
Notes: a) Drainage to Pudding River along the straight-away sprayed for grasses; b) Paths of environmental exposures through surface water run-off, migration through soils and drift, human exposure through open car windows, ventilation systems, contact with shoes and clothing, and drift.

4D. **Oregon Toxics Alliance Highway 36 No Spray 12-Mile Project**
Location: Highway 36 (7/2011)
Notes: a) Straight-away section close to the river is patrolled for invasive weeds and prepared for summer mowing; b) Mowing will cut back non-invasive weeds along the roadside for visibility and surface protection.

Appendix 5. **Examples of Pesticide Use on Highway Straightaways**

5A. **ODOT Vegetation Best Management Practices**
Location: Along I-5 near Beltline Highway (7/2011)
Notes: a) Broadleaf weeds are not listed invasive varieties, but were sprayed nonetheless; b) ODOT will mow dead vegetation to reduce fire hazard within weeks after the spray.

5B. **Oregon Toxics Alliance Highway 36 No Spray 12-Mile Project**
Location: Highway 36 (7/2011)
Notes: a) Wildflowers grow along the straight-away section near Blachly; b) ODOT mowed portions of Hwy 36 in August.

Appendix 6A - Example of ODOT Daily Spray Report

This report is for Highway 126E on 4/29/2009

DAILY SPRAY REPORT

OREGON DEPARTMENT OF TRANSPORTATION

DATE: **4/29/2009**

HIGHWAY No	MP	TO	SPRAY WIDTH	NON-ROADWAY SITE DESCRIPTN	CREW NO:
15 MCKENZIE	13	52	6 feet		2501 MCKENZIE BR SEC 20993
	52	13	TOTAL SHLDR SPRAYED 78.00 miles		COUNTY: Lane
	MP	TO	AREA SPRAYED *39.00 acre 15.78 hectare		EA/ SUBJOB: M0204409000
	MP	TO			

MAT. CODE	PRODUCT USED	CHEMICAL NAMES	EPA No	RATE / ACRE	RATE / 100gal	TOTAL QUANTITY (undiluted quantity)	TOTAL QUANTITY (metric)
0	Razor Pro	Glyphosate (41%)	228-366	48		1872 oz	55360 mL
0	Landmark XP	Sulfometuron Methyl 50%, Chlorsulfuron 25%	352-645	4.5		176 oz	4990 mg

LIST OF ADDITIVES AND APPLICATION RATES: **PHASE AT 4 OZ ACRE**

TYPE OF CARRIER: **Water**

ESTIMATED AMOUNT OF CARRIER PER ACRE: **35** gallons

SITE TREATED:
- [x] ROAD
- [ ] INDOOR-OFFICE
- [ ] INDOOR-PARK
- [ ] OUTDOOR-OFFICE
- [ ] OUTDOOR-PARK
- [ ] OTHER

ROAD SITES (CHECK THOSE THAT APPLY)
- [x] SHOULDER
- [ ] MEDIAN
- [ ] DITCH
- [ ] CULVERTS
- [ ] BRUSH
- [ ] SIGN POST
- [ ] LAWNS
- [ ] SHRUB BED

SITE DESCRIPTION:

PESTS:
- [x] WEEDS
- [ ] INSECTS
- [ ] RODENTS
- [ ] GROWTH REGULATOR
- [ ] OTHER **Weed control**

NOXIOUS WEEDS:
- [ ] LIST "T"
- [ ] LIST "A"
- [ ] LIST "B"

TYPE OF PESTS SPRAYED: **GRASSES AND BROADLEAFS**

SPRAY TIME: **10:25 PM** TO **4:30 AM**

TEMPERATURE: **38** TO **34** F

WEATHER CONDITIONS: **Clear**

WIND CONDITIONS: **Calm**

TYPE APPLICATION: **Boomless Spray Head**

SPRAYER EQUIPMENT NUMBER: **RE821512**

SPRAY PRESSURE: **35** psi

COMMENTS:

Error notes:

Appendix 6B - Example of ODOT Report on Chemical Subtotals for Lane County Highways

7/29/2008

7/28/2008 - Rpt: DSR5 **DAILY SPRAY REPORT (Chemical Subtotals)** Page 2 of 11

Selection: **Crews (-), Districts (5-), Regions (-), Highways (-), Dates (1/1/2007-12/31/2008)**

ID#	CREW#	Date	Hwy	BMP	EMP	PRODUCT NAME	RATE/ ACRE	RATE/ 100g	CARRIER gal/acre	TOTAL		TOTAL ACRE *
15296	2503	5/10/2007	229	39	51.59	Aquaneat	64			935.0	oz	14.6
	Count = 19			**Aquaneat (228-365)**			*Ave = 27.7 oz/ acre			59.7	quart	69.0
15038	2537	2/8/2007	227	1.7	2	Casoron 4G	150			60.0	lbs	0.4
	Count = 1			**Casoron 4G (400-168)**			*Ave = 150.0 lbs/ acre			60.0	lbs	0.4
15247	2520	4/26/2007	1	168.7	175.8	Crossbow		192	100- Water	46.0	oz	3.0
15260	2520	4/30/2007	1	168.7	186.4	Crossbow		192	100- Water	30.0	oz	4.0
15239	2520	4/24/2007	1	179.0	192	Crossbow		192	100- Water	26.0	oz	2.0
15290	2520	5/7/2007	1	191	207	Crossbow		192	100- Water	127.0	oz	3.0
15291	2520	5/14/2007	1	193.5	198.4	Crossbow		192	100- Water	20.0	oz	2.0
15305	2504	4/27/2007	18	11.3	11.45	Crossbow		192	100- Water	6.0	oz	1.0
15263	2520	5/1/2007	62	29	50	Crossbow		192	100- Water	80.0	oz	3.0
15292	2520	5/15/2007	69	0.6	11.66	Crossbow		192	100- Water	74.0	oz	2.0
16563	2502	10/22/2007	69	3	9	Crossbow		128	100- Water	196.0	oz	1.5
15272	2520	5/2/2007	200	0.12	19.28	Crossbow		192	100- Water	12.0	oz	3.0
15237	2520	4/24/2007	225	1.01	2.04	Crossbow		192	100- Water	28.0	oz	2.0
	Count = 11			**Crossbow (62719-260)**			*Ave = 24.3 oz/ acre			20.2	quart	26.5
17285	2502	4/7/2008	1	168	185	Diuron 4L	256			4097.0	oz	16.0
17289	2502	4/9/2008	1	168	203	Diuron 4L	256			6528.0	oz	25.5
17286	2502	4/8/2008	1	195	203	Diuron 4L	256			2202.0	oz	8.6
17287	2502	4/8/2008	1	203	209	Diuron 4L	256			1945.0	oz	7.6
17290	2502	4/9/2008	1	203	209	Diuron 4L	256			2048.0	oz	8.0
15199	2502	4/23/2007	18	0	6	Diuron 4L	256			845.0	oz	3.3
15224	2502	4/24/2007	18	0	6	Diuron 4L	256			786.0	oz	3.0
17288	2502	4/8/2008	18	0	6	Diuron 4L				1280.0	oz	5.0
15200	2504	4/23/2007	18	6	19	Diuron 4L	256			3738.0	oz	14.6
17291	2502	4/10/2008	69	3	12	Diuron 4L	256			2816.0	oz	11.0
15202	2502	4/23/2007	222	5.52	8	Diuron 4L	256			768.0	oz	3.0
15206	2502	4/24/2007	222	5.52	14	Diuron 4L	256			1613.0	oz	6.3
	Count = 12			**Diuron 4L (66222-54)**			*Ave = 8.0 quart/ acre			895.8	quart	111.9
15481	2502	6/14/2007	69	2	10	Escort / Escort XP		2	100- Water	3.0	oz	1.5
15464	2502	6/12/2007	69	5	9	Escort / Escort XP		2	100- Water	6.0	oz	3.0
14945	2502	2/12/2007	91	110	119	Escort / Escort XP		2	100- Water	0.5	oz	0.25
15495	2502	6/20/2007	91	111	118	Escort / Escort XP	2			2.0	oz	1.0
15519	2502	6/20/2007	227	1	4	Escort / Escort XP		2	100- Water	2.3	oz	1.3
14944	2502	2/12/2007	227	7	8	Escort / Escort XP		2	100- Water	1.5	oz	0.75
	Count = 6			**Escort / Escort XP (352-439)**			*Ave = 2.0 oz/ acre			15.3	oz	7.8
15247	2520	4/26/2007	1	168.7	175.8	Garlon 3A		256	100- Water	22.0	oz	3.0
	Count = 1			**Garlon 3A (464-546)**			*Ave = 7.3 oz/ acre			22.0	oz	3.0
15347	2502	5/30/2007	1	168	182	Garlon 3A		256	100- Water	128.0	oz	0.5
16639	2520	10/22/2007	1	168	186	Garlon 3A		192	100- Water	80.0	oz	1.5
15260	2520	4/30/2007	1	168.7	186.4	Garlon 3A		256	100- Water	55.8	oz	4.0
16643	2520	10/24/2007	1	169	209	Garlon 3A		192	100- Water	24.0	oz	0.5
15239	2520	4/24/2007	1	179.0	192	Garlon 3A		256	100- Water	22.0	oz	2.0
16020	2502	8/9/2007	1	188	195	Garlon 3A		256	100- Water	256.0	oz	1.0
15290	2520	5/7/2007	1	191	207	Garlon 3A		256	100- Water	15.0	oz	3.0
15291	2520	5/14/2007	1	193.5	198.4	Garlon 3A		256	100- Water	25.0	oz	2.0
16853	2502	11/23/2007	1	194	194.1	Garlon 3A		12800	1-	128.0	oz	1.0
16642	2520	10/23/2007	1	196.7	199.2	Garlon 3A		192	100- Water	44.0	oz	1.0
16645	2520	10/24/2007	1	199.2	209.1	Garlon 3A		192	100- Water	74.3	oz	1.5

Appendix 7

Oregon Transportation Commission Chair Dr. Gail Achterman's response to Agenda Item E, No Spray Pilot Project
Oregon Transportation Commission Meeting, Wilsonville, Oregon - 5/13/10

Agenda is accessible at http://www.oregon.gov/ODOT/COMM/docs/OTCagenda2010may.pdf

Audio Record was accessed online at: ftp://ftp.odot.state.or.us/outgoing/OTC/05_May/Audio/

At approximately 33:15 on the MP3 tape---

Chair Achterman: "I am very worried about this issue [of pesticides]. I think we've done a lot to develop and implement an Integrated Pest Management plan, but I don't think it's good for our employees, nor do I think it's good for society, to be using herbicides when other alternatives are available. And I think our IPM policy recognizes that and really has moved in this direction. But I think with the citizen concerns over this issue, and, as you know Commissioner Nelson and former Commissioner Wilson were particularly concerned about these issues, we really need to take the kind of approach we've taken on our Safety Plan to our Vegetation Management program. And I think we need to give some consideration and figure out what our strategy is going to be for reducing, and setting a programmatic way, for reducing the amount of herbicides we use.

I think we are going to have to reserve them as a tool for invasive species because that's another major risk that needs to be addressed. But I think the testimony on what the exposure is going to be for us if we continue to use them, both under the Clean Water Act and the Endangered Species Act, we're going to start running into real liability exposure on the continued use of these toxics, particularly as we learn more about their impact on listed species.

So I think we've got to develop a much more aggressive plan to programmatically figure out how to reduce the amount that we use.

And you guys are the experts. We've got a lot of other people, I know, that'll help, but it is Vegetation Management in general. And my personal view is that, in Europe, highway rights of way are a place where threatened and endangered species thrive. And biodiversity conservation in many European nations is mainly happening in the highway right-of-way corridors because it's the only contiguous area for a lot of amphibians, and insects, as well as a lot of plants.

And so the testimony we've heard today adds a whole new element to this. It's not just what our vegetation management is doing in terms of the toxics use, it's what our vegetation management is doing in terms of disrupting natural ecosystems. And so I'm concerned about where we're headed right now. It's a much bigger issue, and we're not going to resolve it today, but we need more work."

(Continued after Director Garrett's question) "… We do have an award-winning IPM program, but we need to start thinking beyond traditional IPM into sustainability, and figure out how we do that as an organization. So again, you guys need to think about where it fits in the whole big scheme of things, but we've got citizen concerns that are extremely legitimate, both on the toxics side and on the impact on native species side, and I think we need to pay attention to that and figure out a responsible way for addressing it, moving forward, and figure out where it fits into all the other things we have to do. But it is an important issue. Thanks."

Appendix 8

EHRA
ENVIRONMENT AND
HUMAN RIGHTS
ADVISORY

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ODOT Herbicide Applications Along State Highways: Human Rights Concerns

Prepared for: Oregon Transportation Commission

Commissioned by: Concerned Citizens for Clean Air and Oregon Toxics Alliance

Matter of Concern: ODOT road shoulder herbicide applications and human health effects

Date: April 23, 2008

Executive summary

The Vegetation Management Program of ODOT's Office of Maintenance uses a variety of methods for control of vegetation on shoulders of state-maintained roads and highways including mowing, shoulder grading, manual control and chemical herbicide control, currently the Program's primary vegetation management tool.

In February 2007 CCCA issued a report titled *Herbicide Use on Oregon Highway Shoulders – Time to Stop?* which detailed the types and quantities of herbicide products used on Oregon highway shoulders, examined their effectiveness, provided information about their effects on human health and the environment, and suggested that roadside vegetation could be controlled with significant reductions in chemical herbicide use. It raised ethical and human rights concerns about broadcast herbicide use and offered recommendations for alternative methods of vegetation control.

In May 2007, at CCCA's request and supported by citizen petitions and letters from local elected officials, ODOT Director Matthew Garrett designated a 25 mile section of coastal highway 101 as a pilot project to evaluate methods, costs and consequences of eliminating or reducing herbicide use on highway shoulders.

Reports of acute health effects from exposure to road shoulder herbicides and residues, along with concerns about long-term health effects that can result from multiple and prolonged exposures, were noted.

Viewed in light of human rights standards, these issues may raise liability concerns for ODOT.

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Human Rights norms of concern

Human rights standards are justified moral claims held by all persons vis-à-vis their governments, and moral duties that governments at all levels owe their citizens.

Human rights standards are recognized as trumping other types of policy considerations such as utility, cost-benefit analysis, social policy, etc. Additionally, human rights norms represent basic moral minimums, a moral floor beneath which state and state-regulated behaviors must not sink. If civil laws represent hard legal boundaries outside of which certain behaviors are not legally permissible, human rights standards represent hard ethical boundaries outside of which certain behaviors are not morally permissible.

Governments that sign human rights treaties, as the US has done, commit themselves to promulgating these norms and to being held accountable to them.

This report details twenty-three human rights norms of concern, including:

- The right to security of person and bodily integrity. This is one of the most basic of rights and is articulated in many human rights treaties, including the instruments that make up the International Bill of Human Rights
- The family's right to protection – also articulated in the instruments composing the International Bill of Human Rights.
- The right of motherhood and childhood to special care and protections
- The right of the child to the highest standard of health – both of these articulated in the same instruments as well as in the 1990 *Convention on the Rights of the Child*.

In addition, the *Declaration of Alma-Ata* reminds states that they are responsible for regulating agricultural, forestry, industry, transportation and other sectors to protect citizens' health.

Potential liabilities

Potential consequences of continuing to apply chemical herbicides on state roadways include a risk of public and perhaps media perception that OTC and ODOT do not respect human rights norms, potentially resulting in diminished institutional trust which, when lost, can take decades to earn back.

Possible economic risks include potentially costly legal actions brought against ODOT under the Americans with Disabilities Act for failure to accommodate, possible legal actions for pesticide injury, and multiple small claims court actions.

One goal of human rights activism, often referred to as "the mobilization of shame," involves human rights organizations using tools such as media attention, video recording of actions considered to be human rights violations and of persons responsible for them, posting those videos publically, and holding citizens' inquiries and tribunals.

Pathways to reduce liabilities

The first step to reduce liabilities would be for ODOT to initiate good faith discussions with Oregon Toxics Alliance, Concerned Citizens for Clean Air and other public citizen

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groups, and to suspend roadside applications in areas of concern until satisfactory agreements can be reached in those discussions.

ODOT should rely as much as possible on non-chemical means of vegetation control.

If some chemical herbicide use were to continue, ODOT should provide examples of well-designed population studies undertaken by third parties (i.e., not pesticide manufacturers or agriculture/forestry interests) that demonstrate no adverse health effects from exposure to the relevant pesticide formulations. Such studies may not be available, but if they are they should be provided.

Wide public notification should be provided at no charge and by multiple means, and should include attached labels and MSDS sheets for each relevant herbicide product.

Alternative routes of travel should be provided during and after spray operations for school buses and other vehicles that transport children, the elderly and other vulnerable persons who need to avoid herbicide exposure.

Strategies should be developed for insuring that place bound persons (those in daycare facilities, elder care facilities, hospitals, schools, etc) not be required to endure spray exposures.

ODOT should insure that school zones and bus stops remain free of herbicides, drift and residues.

ODOT should arrange for health effects monitoring studies to be undertaken by the Department of Health or independent third parties. Active (not passive) surveillance should monitor for a range of adverse health effects, both acute and chronic. Representatives from citizen groups should be actively involved in all phases of these studies: design, planning, implementation and monitoring.

Oversight by external observers, agreed to by ODOT and citizen environmental organizations, should be arranged to monitor implementation or the road spray program.

Full report available at: http://tinyurl.com/3tz6254