

**A Policy Framework for Adopting
the Precautionary Principle**

**Submitted by the Seattle Precautionary Principle Working Group
to the City of Seattle and King County
for consideration as an amendment to the
2004 City and County comprehensive plans**

January 2004

**Organizational Endorsements as of January 30, 2004
(further endorsements pending):**

American Lung Association of Washington
Asian Pacific Environmental Exchange
Basel Action Network
Institute for Children's Environmental Health
Institute for Neurotoxicology and Neurological Disorders
Newground Investment Services
Washington Physicians for Social Responsibility
Washington State Nurses Association
Washington State Association of Occupational Health Nurses
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Acknowledgements:

Thanks to primary authors Steven G. Gilbert, Ph.D., D.A.B.T., Sibyl Diver and Elise Miller, M.Ed. for their work preparing this white paper and A.T. Birmingham-Young for copy editing, in collaboration with the Seattle Precautionary Principle Working Group.

The Seattle Precautionary Principle Working Group is a subcommittee of the Collaborative on Health and the Environment-Northwest (CHE-NW). The precautionary principle was first addressed at CHE-NW's meeting in the summer of 2003. CHE-NW is a part of the national effort to bring together people representing government, academic, medical, health-affected and community-based organizations committed to building a strong, sustainable and collaborative movement to protect current and future generations from harmful environmental exposures. CHE-NW represents a wide range of local organizations and is coordinated by Elise Miller, M.Ed., Executive Director of the Institute for Children's Environmental Health.

The committee also wishes to acknowledge and thank Joel Tickner, Ph.D. with the Lowell Center for Sustainable Production, Carolyn Raffensperger, J.D., Ted Schettler, M.D., M.P.H. and Nancy Myers of the Science and Environmental Health Network, Janet Nudelman of the Breast Cancer Fund, and other members the Bay Area Working Group on the Precautionary Principle for their contributions to the current literature and public policy on the precautionary principle. Their excellent efforts have helped to provide the foundation for this white paper.

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EXECUTIVE SUMMARY

John Muir once wrote about the interconnectedness of the world, “When we try to pick out anything by itself, we find it hitched to everything else in the Universe.” Since human society does not understand every intricacy of the web of life, we must make decisions based on our imperfect knowledge of the world. We must use what we do know to prevent harming the ecological systems we depend on for health and well-being.

Recognizing the recent increases of costly illnesses linked to environmental exposures such as childhood cancer, learning disabilities and others, we choose to apply the precautionary principle in the face of scientific uncertainty because the quality of our lives and our very lives are at stake.

The foundation of the precautionary principle can be expressed as the common-sense advice to “err on the side of caution.” The principle is based on a desire to prevent harm to the environment, human health, other living creatures and ecological systems. It is intended to apply to a range of situations that involve both a threat of harm as well as scientific uncertainty.

In this white paper, we propose that the City of Seattle and King County adopt the precautionary principle as a policy framework for decision-making. The precautionary principle is defined as follows:

“Where threats of serious or irreversible harm to people or nature exist, anticipatory action will be taken to prevent damages to human and environmental health, even when full scientific certainty about cause and effect is not available, with the intent of safeguarding the quality of life for current and future generations.”

The precautionary principle includes the following key components:

1. Taking anticipatory action to prevent harm in the face of scientific uncertainty.
2. Exploring alternatives, including the alternative of “no action.”
3. Considering the full cost of environmental and health impacts over time.
4. Increasing public participation in decision-making.
5. Shifting responsibility for providing evidence to proponents of an activity.

An essential component is the need to evaluate the full range of alternatives when pursuing an activity, new technology or product and to ensure meaningful public participation in the alternatives analysis and decision-making.

Individual policies in Washington State, King County and the City of Seattle include aspects of the precautionary principle. However, adopting our recommended amendment within City and County Comprehensive Plans would provide a more comprehensive and unified approach to decision-making in local government—an approach which is based on the values held by Seattle and King County and which recognizes the importance of realizing the quality our health depends on the quality of the environment.

INTRODUCTION

We recognize that rapid advances in technology over the last one hundred years have resulted in stunning improvements in human health and well-being. For example, life expectancy has increased significantly, while mortality from many communicable diseases and infant mortality have declined. However, these rapid advances are also responsible for forty-seven active Superfund sites in Washington State. We now know that even low-level exposure to some of the chemicals developed in the last fifty years can cause adverse effects that last a lifetime. For instance, a child exposed to lead from old paint or contaminated soils may appear healthy, but can nonetheless suffer permanent reductions in his or her cognitive ability.

Thus, decision-makers must consider the history of introducing dangerous substances such as lead, cigarettes and asbestos into our environment and our lives. With all of these substances, we encountered scientific evidence of serious health impacts early on. For example, consider that scientists and policy-makers were aware of tobacco's deadly effects in the 1940's. Yet the tobacco industry successfully denied the lung cancer linkage for years by insisting that there was no conclusive proof and more studies were needed. It was only in 1996 that scientists found the exact link between carcinogens in tobacco smoke and lung cancer. This was the scientific proof that decision-makers were waiting for, while our kids took up cigarettes. The history lesson here is that the delay between first knowledge of harm and appropriate action can be measured in human lives cut short, huge financial costs, or a severe reduction in quality of life for society as a whole.

As demonstrated by the tobacco example and others, the burden of proving that a specific activity or substance causes harm is typically placed on the public, while the proponent of the activity or product is considered innocent until proved guilty. This approach can jeopardize our right to a safe and healthy environment. Similarly, policy-makers, industry and the public are beginning to understand how having to prove a definitive cause and effect can place us in harm's way while even activities suspected of being harmful continue unhindered.

It is also important to emphasize that health and the environment are inextricably linked. Our decisions regarding natural resource management, industry emissions, unsafe consumer products and waste disposal can cause problems for human health, in addition to damages cause to the environment, other living creatures and ecological systems. To give an example close to home, air pollution from a now-retired copper smelter in Tacoma drifted over Vashon Island for many years. It is only recently that policy-makers and the public have realized that Vashon soils are now contaminated with lead and arsenic as a result. This puts Vashon children in harm's way, and local government has now invested significant time and funding to reduce health risks from this contamination.

Implementing the precautionary principle makes it possible to prevent harm by taking a "better safe than sorry" approach, especially when the life or death of individuals, children's learning potential, or survival of species and ecosystems

are at stake. This approach includes shifting the responsibility of providing evidence that a product or activity is safe onto those proposing it. It also promotes acting upon the best available scientific evidence to prevent harm, even if we are still waiting for further tests and research to occur.

To respond to commonly held misconceptions, the precautionary principle is not anti-technology or anti-science, nor does the precautionary principle cause job loss. Rather, by encouraging businesses and government to fully evaluate alternatives and to choose the least harmful alternative available, the precautionary principle actually creates an incentive to innovate and create new technologies, which result in the safer and healthier alternatives we all desire. In addition, the principle cannot be anti-science because, by definition, it requires the best available science for its implementation. And finally, there is strong evidence that the precautionary principle actually creates jobs. For example, the environmentally protective practice of recycling results in more jobs than environmentally harmful activities, such as landfilling. Building, installing, operating and inspecting pollution control equipment create skilled industrial jobs as well (Ackerman and Massey 2002).

Our collective experience has clearly demonstrated that society requires a new approach to protecting human and environmental health, based on the precautionary principle. The Seattle Precautionary Principle Working Group intends for this white paper to provide necessary background information on the precautionary approach and to assist Seattle and King County in their consideration of the approach for their respective Comprehensive Plans. Specifically, this paper attempts the following:

- To explain the meaning and origin of the precautionary principle;
- To expand on the current need for this approach;
- To address the economic opportunities presented by the precautionary principle,
- To provide relevant examples of a precautionary approach currently being taken by the State of Washington, King County and the City of Seattle; and
- To recommend a policy framework, which would adopt the precautionary principle as a foundation for decision-making in Seattle and King County within their respective city and county Comprehensive Plans.

Please note that the terms “precautionary principle” and “precautionary approach” are used interchangeably throughout this document.

PART I – Understanding the Precautionary Principle

A. Defining the Precautionary Principle

The foundation of the precautionary principle is conveyed by the common-sense advice to “err on the side of caution.” The principle is based on a desire to prevent harm to the environment, humans, other living creatures and ecological systems. It is a value statement, intended as an approach to decision-making, which asks decision-makers, policymakers and communities to consider the full range of direct and indirect costs of our decisions to health and the environment, even when full scientific certainty about potential harmful effects is lacking.

Major categories of such health and environmental effects include:

- Childhood cancers, asthma, or neurobehavioral deficits;
- Global warming and atmospheric change;
- Resource depletion (e.g., oil and gas, water, metals and minerals, etc.);
- Effects of hazardous agents in the environment (e.g., toxic chemicals, microbiological agents, particulate matter, etc.); and
- Biodiversity and habitat loss.

More specifically, the precautionary principle is intended to apply to a range of situations that involve both a threat of harm and scientific uncertainty. This means that the precautionary principle should be applied when two instances hold true 1) when we suspect our actions may pose a threat to human or ecological health and 2) when scientific uncertainty might otherwise keep us from taking action to prevent harm.

Therefore, the precautionary principle is defined as follows:

“Where threats of serious or irreversible harm to people or nature exist, anticipatory action will be taken to prevent damages to human and environmental health, even when full scientific certainty about cause and effect is not available, with the intent of safeguarding the quality of life for current and future generations.”

The precautionary principle also includes the following key components:

- 1) Taking anticipatory action to prevent harm in the face of scientific uncertainty.** The scientific method is designed to test hypotheses rather than to determine proof of cause-and-effect relationships. Therefore an activity should be evaluated based on the best available science. Knowledge gaps should be considered alongside existing information. Decisions should be fluid and structured so as to ensure reevaluation, when additional and relevant scientific evidence becomes available. Whenever possible, the timeframe for taking action should encourage preventing harm, before it occurs. One effective way of taking anticipatory action is to set policy goals, which aim to protect human health and the environment, and to work towards these goals over time. The duty to prevent harm is shared by the government, business and community groups, and the general public.

- 2) Exploring alternatives, including the alternative of “no action.”** For most activities, a range of alternative products or actions is available. It is common-sense to choose the action or product which will cause the least harm. In order to ensure a healthy and safe environment for communities, the alternative of “no action” should also be considered in an alternatives analysis. When alternatives are not readily available, it is necessary to take this into account and to begin developing such alternatives.

- 3) Considering the full cost of environmental and health impacts over time.** Costs analysis should account for the full range of costs associated with a product or service over its life-cycle, including manufacturing, use and disposal. This approach should not only consider the immediate benefits of a certain action, but should also address its direct and indirect costs to society and the environment. This should include costs associated with negative externalities. Short- and long-term impacts should be evaluated by all parties, as well. The intention here is to provide a more integrated approach to analysis and decision-making.

- 4) Increasing public participation in decision-making.** Public participation in a democratic process ultimately results in a better decision. Also, when the full range of stakeholder viewpoints are incorporated into decision-making, the decision is more likely to be implemented as intended. Ensuring transparent, inclusive and open decision-making processes is essential to increasing public involvement. Public education about environmental and public health issues is needed to provide local residents with tools for evaluating alternatives, as well. In order to reach a good decision, residents must be empowered to assess potential short- and long-term impacts for a range of alternatives.

- 5) Shifting responsibility for providing evidence to proponents of an activity.** This means that the proponent of an activity, process, new technology, chemical or product will bear the responsibility for providing evidence regarding its safety. This is in contrast to the current norm, which requires the public to provide evidence of harm. The proponent of an activity is, therefore, responsible for providing complete and accurate information on the potential human health and environmental impacts of the activity, as well as monitoring the activity over time and disclosing this information to the public. The proponent of an activity is also responsible for costs incurred, if an activity is not performed in a safe or healthy manner. Industry assurance bonds or reclamation bonds are one way to ensure funds are available for a cleanup.

B. History of the Precautionary Principle

The precautionary principle originates from the German principle of foresight or *Vorsorge*. Germany further developed this principle in the 1970's as a foundation for its environmental law and policies on global warming and acid rain. Embracing the principle has also led to a strong and innovative environmental industry in Germany.

The United States first endorsed the precautionary principle when the U.S. federal government signed and ratified the Rio Declaration following the 1992 United Nations Conference on Environment and Development in Rio de Janeiro. **The Rio Declaration definition, also referred to as Agenda 21**, states:

“In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”

This definition focuses primarily on environmental impacts and has been expanded to include public health concerns. In 1998, activists, scholars, scientists and lawyers gathered to discuss methods for implementing the precautionary principle at Wingspread, the home of the Johnson Foundation in Racine, Wisconsin. The goal was to determine how the precautionary principle could be used in daily environmental and public health policy decisions at the state and federal level. The conference produced the following definition, known as the **1998 Wingspread Statement on the Precautionary Principle**:

“...When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. The process of applying the precautionary principle must be open, informed and democratic and must include potentially affected parties. It must also involve an examination of the full range of alternatives, including no action. In this context the proponent of an activity, rather than the public, should bear the burden of proof.”

The precautionary principle has since been articulated widely in international statements and laws that apply to high-stakes environmental or health concerns. The underlying idea behind each statement is that action should be taken to prevent harm to the environment and human health, even if scientific evidence is inconclusive.

The precautionary principle often functions as a statement of values, to be used as a guideline in decision-making process. However, it should be pointed out that the precautionary principle is also being enforced more directly in the context of international agreements, including:

- **The Cartagena Protocol on Biosafety of 2003**, which allows countries to apply the precautionary principle in decisions on importing genetically modified organisms¹; and
- **The Stockholm Convention on Persistent Organic Pollutants of 2001**, which uses the precautionary principle as a standard for adding to its original list of 12 banned chemicals.²

In the U.S., the principle is not expressly referred to in the law. However, the idea of taking precautionary action to prevent harm is at the foundation of several important pieces of legislation. These include:

- **The National Environmental Policy Act of 1970**, which requires any federally funded project that could potentially harm the environment to undergo an environmental impact study to evaluate whether safer alternatives are possible;
- **The Clean Water Act of 1972**, which established clear water safety goals and standards, in order to protect the “chemical, physical, and biological integrity of the Nation’s waters;”
- **The Occupational Safety and Health Act of 1970**, which aims to ensure safe and health working conditions for U.S. men and women;
- **The Pollution Prevention Act of 1990**, which was enacted following the tragic Exxon-Valdez oil spill to set prevention as the highest priority of U.S. environmental programs; and
- **The Food Quality Protection Act of 1996**, which calls for several uses of organophosphate pesticides to be phased out and requires pesticides to be proven safe for children or else not used.

¹ The Cartagena Protocol on Biosafety of 2003, <http://www.biodiv.org/biosafety/default.aspx>

² The Stockholm Convention on Persistent Organic Pollutants, <http://www.pops.int/>

PART II – The Need for the Precautionary Principle

A. Health, the Environment and Social Costs

We have all heard the adage, “An ounce of prevention is worth a pound of cure.” But in the case of protecting our health and the environment, it is even more appropriate to replace “pounds and ounces” with “dollars and cents.”

The links between environmental exposures, children’s health and costs to society demonstrate that taking precautionary measures to decrease children’s exposure to environmental contaminants can result in significant economic benefits for society as a whole.

Consider the cost of cancer and asthma alone, in Washington State.

- An estimated 450,000 adults and 151,000 children in Washington State currently have asthma, with the state’s asthma prevalence rate being one of the highest in the nation (ALAW data, CDC 2000).
- In 1999, Washington had 5,252 hospitalizations with a primary diagnosis of asthma. These hospital visits added up to 15,861 hospital days, equivalent to \$26.6 million (ALAW data).
- Cancer was the second leading cause of death in the Washington State in 2000 and responsible for 10,656 deaths, or 25% of all deaths statewide;
- Female breast cancer was the most common cancer diagnosed in Washington State 2000, with 5,344 new cases diagnosed;
- Based on national data, the Washington State Department of Health estimates that some form of cancer will strike one in three Washingtonians in their lifetime (Washington State Cancer Control Plan 2004-2008).

Children’s Environmental Health

Concern for children’s environmental health, in particular, is growing across the nation. An estimated 12 million children in the U.S. suffer from one or more learning developmental or behavioral disorders (Boyle et al. 1994). Childhood leukemia and brain cancer have been increasing since the 1970s (Legler et al. 1999). Birth defects remain the leading cause of infant death (Scott et al. 1998).

While genetic factors are thought to account for 10-20% of cases of chronic disease in childhood, the majority of causes are unknown. It is strongly suspected that some pediatric diseases are caused in part by exposures to environmental toxics and other preventable risk factors. For example, fetal mercury exposure has been shown to impair learning, memory and attention in children as they grow older, and IQ deficits in adolescent children are linked to fetal PCB exposure (Schettler et al. 2000). In addition, a recent study by the Harvard Center for Cancer Prevention concluded that 2% of cancer deaths are caused by industrial toxics released into the environment, equivalent to the death of almost 11,000 individuals in the U.S. every year (Montague 1998).

It is also important to understand that children's exposures to environmental hazards are often greater than those of adults. Pound for pound, kids eat more food, drink more water and breathe more air than adults. Because children are small, when their food, water or air contains toxic chemicals, they receive a greater proportional dose of toxic chemicals or other hazards than adults. Children face other risks simply because their biological systems are still developing. Therefore, because children are uniquely vulnerable, the usual assumptions about "safe" exposure levels to chemicals and other environmental contaminants often do not hold.

Costs of Childhood Disease

While childhood disease brings emotional suffering and impinges on families' quality of life, its economic impacts must be considered, as well. A recent study estimated that disabilities associated with childhood lead exposure in the U.S. cost \$43.4 billion in 1997 alone. The combined costs of asthma, cancer and developmental disabilities were estimated to be \$54.9 billion for the same year (Landrigan, Schechter, et al. 2002). Another study found that a small reduction in blood-lead levels in U.S. children, equivalent to one microgram per deciliter, could save the U.S. economy between \$5 to 7.5 billion a year, when savings in health and educational costs as well as earning potential were taken into account (Rice 1998).

Researchers and policymakers do not know the overall costs of childhood illness in Washington State. But a recent Massachusetts study has estimated that the direct and indirect costs of childhood illness range from \$1.1 to \$1.6 billion annually in this single state (Massey and Ackerman 2003). If the prevalence of childhood disease in Washington's is anything similar to that of Massachusetts, there are significant economic savings to taking preventative action, which would result in even a partial reduction in childhood disease.

Lower-Income Communities and Communities of Color

It is also important to recognize that the cost of disease from environmental exposures is not borne equally among local communities. A recent Department of Ecology study found that there are a greater number of industrial facilities in low-income and minority communities, which may result in higher exposures among these residents (WSDOE 1995). There are also concerns that, since a higher proportion of minority and low-income residents reside in urban areas, these groups may be exposed to higher than average levels of diesel exhaust, a probable carcinogen (Washington State Cancer Control Plan 2004 to 2008). Another study by the Seattle-King County Department of Public Health found that King County asthma hospitalizations were highest for children in high-poverty for 1994 to 1996 data (Seattle-King County Department of Public Health 1998). The Washington State Board of Health recently completed a comprehensive study of environmental justice in Washington and recognized the importance of gathering more definite data on this problem (WSBOH 2001).

In addition, lower-income communities are less likely to have health insurance and can therefore face barriers to getting treated for diseases linked to environmental exposures. For example, lower-income adults in King County households earning less than \$25,000 per year were 10 times more likely to lack health insurance coverage than those with higher incomes of \$50,000 or more per year, based on 1996 to 1998 data (Seattle-King County Department of Public Health 2000).

B. The Science of Precaution

As scientists struggle to understand the complex interactions between ecological systems and human society, we must recognize that there is much we do not know. Consider the single example of the chemicals on the market. There is no toxicity data for 43% of the 15,000 chemicals in use today (EPA 1998). In addition, there are only 12 chemicals for which there is complete neurotoxic data (Makris 1998). Also, scientists are only just beginning to study how these chemicals interact with one another in the environment and in our bodies. Society lacks important information about a large number of products in consumer products, in our homes, at our workplace and in schools.

However, given the historical examples of late lessons from early warnings presented in the introduction and appendix of this paper, it is clear that decision-makers often dismiss the science they have, based on charges of uncertainty. By adopting the precautionary principle, decision-makers can choose to use the best available science, given the reality of limitations on scientific knowledge. Then a decision should be reevaluated, when additional and relevant scientific evidence becomes available.

Precaution and Risk Management

The precautionary approach differs significantly from traditional risk management. By definition, the goal of risk assessment is to manage risk, not to prevent it. Risk management asks the question, “How much harm is allowable?”, while the precautionary approach asks, “How little harm is possible?”

Others have likened this to making a decision about exposing children to toxic chemicals. In this case, risk assessment might attempt to define how many children would suffer developmental disorders or cancer after playing with a plastic toy that leaches chemicals of poorly understood toxicity. With the risk assessment in hand, policymakers may then attempt to define how many diseased children (one in 10,000? 100,000?) would be acceptable. This process provides no incentive to examine an alternative option in which toys are only made from materials known to be safe for children.³

The precautionary approach advocates for recognizing knowledge gaps alongside existing information. Risk assessments, on the other hand, are biased heavily towards quantitative assessment of a narrow set of actions. Even if there are no numbers to demonstrate adverse effects to our health and the environment, there are often no numbers to rule them out. Lack of data does not mean that decision-makers should wait before using alternatives generally known to be less toxic.

³ This example was first presented in the San Francisco Precautionary Principle White Paper.

C. Alternatives Analysis

Of course, precautionary principle advocates do not expect that this approach can make for zero-harm or zero-risk decisions. But it is possible to move towards creating a safer and healthier environment by looking for the least harmful alternative.

Therefore, the precautionary principle advocates for moving away from “risk assessment” and moving towards “alternatives analysis.” Risk assessment may be used as part of this process evaluating alternatives, but not as the end unto itself. In other words, the two approaches are not incompatible, though their primary goals differ.

In evaluating alternatives, decision-makers faced following a precautionary approach would be likely task questions, such as:

- If there are alternatives, is this one necessary?
- Why are we doing this?
- Is this the best way?
- Do we have better choices?
- Who benefits from the various alternatives?
- Who and what will be harmed by our decision?
- In light of the available alternatives, how can we avoid or mitigate harm?
- In light of new science, should current practices be reevaluated?⁴

⁴ Questions developed by the San Francisco Precautionary Principle Working Group. See http://www.breastcancerfund.org/pdfs/white_paper.pdf

PART III – Precaution and Economics

“How much will it cost to implement the Precautionary Principle, and can we afford it?” These are legitimate questions for taxpayers and policymakers alike. Like precautionary science, precautionary economics operates in the real world, in which connections, costs and benefits are complex and surrounded by uncertainty. Tallying the “cost” of precaution requires making true value judgments, which can only partially be expressed in monetary terms (Ackerman and Massey 2002).

The price tags on most products and technologies fail to represent their full costs in either monetary or non-monetary terms. Methods have been developed to better account for real costs and to distribute costs and benefits more fairly. Three concepts may be particularly useful in reaching a more accurate assessment of costs.

A. Accounting for Negative Externalities

Negative externalities refer to harm (economic, health, social, cultural and so forth) created when individuals or organizations take actions that benefit themselves while forcing some of the costs onto others. When a negative externality is present, the full cost of a product is invisible to producers and consumers. For example, if a manufacturer disposes of toxic waste in a local river, costs are imposed on people who use that river for drinking water, swimming or fishing. However, that cost is not reflected in the price of the goods that manufacturer sells. In other words, the costs imposed on the river system and its users—such as illness, species decimation, or loss of habitat, livelihood, or access—must be built into the cost of the goods.

Accounting for, or internalizing, negative externalities means shifting the costs back onto those who benefit. This is the “polluter pays” principle. The concept of negative externalities is important in environmental policies, such as the European Union’s (EU’s) policy on transportation. In EU Bulletin 1.2.127 (1997), the EU explicitly adopts the approach of “internalizing the external costs of transport as a step towards developing sustainable mobility.” A number of European countries have initiated “green taxes” to internalize costs. For example, the Dutch water boards require polluting industries to pay a tax based on units of pollution emitted—including mercury, cadmium, copper, lead and arsenic. This raises the price of polluting products and technologies and creates a market incentive to reduce pollution emissions.

B. Life Cycle Analysis

Most current production technology is incompatible with the finite nature of earth’s natural resources. Resources are extracted and consumed unsustainably, processed inefficiently, and made into products that are often discarded as waste. The use of toxic materials such as mercury, asbestos, lead, or chlorine-based chemicals in production processes can result in dangerous emissions, by-products and ingredients in final products.

An environmental Life Cycle Analysis (LCA) is a tool that can help to quantify how much energy and raw materials are used and how much waste is generated at each stage of a product's life. Life Cycle Analysis is an emerging discipline, with guides published by institutions such as the Society of Environmental Toxicology and Chemistry and the U.S. Environmental Protection Agency.

C. Performance bonds

The concept behind bottle deposits is simple: to encourage consumers to dispose of the bottle in the most desirable way (recycling) and to help cover the cost if they do not.

Performance bonds, also referred to as reclamation bonds, apply a similar concept in construction and mining projects. Bonds paid by strip miners of public lands, for example, are returned only after the land is restored. Environmental bonding could be developed more broadly and used to assure that developers of new technologies or others seeking to use society's resources are held financially responsible for any potentially damaging activity (Cornwall and Costanza 2000).

Part IV. Applying the Precautionary Principle

A. Applying the Precautionary Principle in the City of Seattle

The City of Seattle currently has a number of policy statements and resolutions that apply a precautionary approach to issues related to the environment. The following examples make a strong case for explicitly endorsing the precautionary principle as the underlying foundation for decision-making in city government.⁵

1. The Washington State Growth Management Act. This policy applies to situations when there is incomplete scientific evidence about whether a development or land use action could harm established critical habitat areas. In such cases, this legislation directs cities and counties to use “*a precautionary or a no risk approach* [emphasis added], in which development and land use activities are strictly limited until the uncertainty is sufficiently resolved.”⁶

2. Washington State Department of Ecology’s Persistent Bioaccumulative Toxins (PBT) program. Ecology’s PBT program advocates for moving away from risk assessment and towards “*precautionary approaches* based on scientific data for addressing PBTs.” It explicitly adopts the precautionary principle as one of the policy’s guiding principles:

“Most regulatory programs currently embody approaches that require agencies to quantify the problems caused by low levels of toxic chemicals before taking actions to prevent those effects. Consequently reasonable preventative measures are often delayed because scientists are unable to precisely define all of the complex interactions between toxic release and environmental danger. More *precautionary approaches* are needed to prevent the environmental harm associated with PBTs.”⁷

3. The City of Seattle’s Endorsement of the Earth Charter. Section 6 of the Earth Charter states that the City should, “prevent harm as the best method of environmental protection and, when knowledge is limited, apply a *precautionary approach*.”

More specifically, the Earth Charter encourages its endorsers to:

- a. Take action to avoid the possibility of serious or irreversible environmental harm even when scientific knowledge is incomplete or inconclusive.

⁵ Office of Sustainability and Environment, <http://www.seattle.gov/environment/>

⁶ See full text of [The Washington Administrative Code \(WAC\) Chapter 365-195](http://www.wa.gov/wac/index.cfm?fuseaction=chapterdigest&chapter=365-195), Growth Management Act – Procedural criteria for adopting comprehensive plans and development regulations, in the Appendix or the website, <http://www.leg.wa.gov/wac/index.cfm?fuseaction=chapterdigest&chapter=365-195>

⁷ See additional relevant text on Ecology’s PBT program in the Appendix or on the web under Department of Ecology programs, PBT Initiative, <http://www.ecy.wa.gov/biblio/0003054.html>,

- b. Place the burden of proof on those who argue that a proposed activity will not cause significant harm, and make the responsible parties liable for environmental harm.
- c. Ensure that decision-making addresses the cumulative, long-term, indirect, long distance, and global consequences of human activities.
- d. Prevent pollution of any part of the environment and allow no build-up of radioactive, toxic, or other hazardous substances.
- e. Avoid military activities damaging to the environment.”⁸

In September 2002, the Seattle City Council and Mayor Greg Nickels formally endorsed the Earth Charter and pledged their intention to be “assertively working towards the realization of its aims so that we can assure a healthy future for our community and for our earth.”⁹

4. The Office of Sustainability and Environment Mission Statement.

The Office of Sustainability & Environment (OSE) emphasizes the importance of preventing pollution and integrating long-term economic, environmental and social costs and benefits into City plans. Its mission is consistent with the precautionary approach and pledges “to provide the leadership, tools and information to help City government and other organizations use natural resources efficiently, prevent pollution and improve the economic, environmental and social well-being of current and future generations.”¹⁰

5. The City of Seattle Purchasing Policies. The City of Seattle Environmentally Responsible Purchasing Policy directs City departments to choose alternative products that prevent harm and states, “The City shall promote the use of environmentally preferable products in its acquisition of goods and services.”¹¹

Several resolutions apply to this overall policy, which specify that departments should make purchasing decisions to achieve the following goals:

- To increase the procurement of recycled and recyclable products (Resolution #28737);
- To improve efficiency of water and energy use (Resolution #29048);
- To reduce products which result in hazardous pollution during manufacture, use, or disposal (Resolution #29268); and
- To reduce products which result in persistent toxic pollution, i.e. pollution from persistent bioaccumulative toxins or PBTs, and to instead favor alternatives, such as penta-free utility poles, chlorine-free paper and non-PVC office products (Resolution #30487).

⁸ For full text of The Earth Charter, see http://earthcharterusa.org/earth_charter.html

⁹ For media coverage on Seattle’s endorsement of The Earth Charter, see <http://www.ci.seattle.wa.us/news/detail.asp?ID=2914&Dept=28>)

¹⁰ For a list of specific Office of Sustainability and Environment responsibilities, see http://www.seattle.gov/environment/About_OSE.htm)

¹¹ For more information on Seattle’s Sustainable Purchasing Program, see <http://www.seattle.gov/environment/purchasing.htm>)

These broad purchasing policies are now being implemented for specific types of products. For example, the policies have guided a proactive set of environmental criteria for janitorial products to ensure the health and safety of city workers.¹² Other product-based decisions impacted by the city's purchasing policies include computer and printer purchasing, battery disposal and the selection of office supplies.¹³

6. The City of Seattle Environmental Action Agenda. This policy articulates the city's goals for protecting environmental quality, promoting environmental justice, and improving quality of life in Seattle for current and future generations. More specifically, the Action Agenda calls for careful monitoring and reporting of environmental impacts:

“The agenda creates a framework for integrated City environmental action, robust tracking and reporting, coherent communication on environmental issues and links environmental stewardship, economic development and social equity.”¹⁴

7. The City of Seattle's Pesticide Reduction Program. This program works to prevent dangerous pesticide exposures by setting target goals, which set important milestones for creating a safer and healthier environment. The two main goals of the program are:

(1) To eliminate the use of the most potentially hazardous herbicides and insecticides, and

(2) To achieve a 30 percent reduction in overall pesticide use.”¹⁵

8. The City of Seattle Comprehensive Plan. The City of Seattle has encouraged meaningful public participation in developing its Comprehensive Plan. Since before 1994, local residents have been empowered to envision what types of amenities, such as parks or transportation, they would need to support this growth in this planning process.

B. Applying the Precautionary Principle in King County

King County's growing population and unique environment has encouraged proactive policies which protect the environment and promote public health. Active programs compatible with a precautionary approach include the following five programs:

1. Hazardous Waste Management. This program provides residents and small businesses with education and collection services for hazardous waste. The program is an example of taking anticipatory action to prevent harm and is self-described as “an intensive effort to reduce and properly manage that waste through education, collection and technical assistance.”¹⁶

¹² For the City of Seattle's Environmental Criteria for Janitorial Products see <http://www.seattle.gov/environment/Documents/JanitorialCriteria.pdf>

¹³ For additional reports related to purchasing and city contracts see <http://www.seattle.gov/environment/purchasing.htm>

¹⁴ City of Seattle Environmental Action Agenda http://www.seattle.gov/environment/action_agenda.htm

¹⁵ See City of Seattle Pesticide Reduction Program <http://www.seattle.gov/environment/pesticides.htm>

¹⁶ See City of Seattle Comprehensive Plan <http://www.metrokc.gov/hazwaste/>

2. Integrated Pest Management (IPM). Both the City of Seattle and King County are working to reduce pesticide use on public lands managed by the City and County by using an alternative pest control method, called Integrated Pest Management (IPM). The IPM strategy is an example of choosing safer alternatives and is defined by the County as:

“a holistic approach to pest (including weed) management. IPM stresses the prevention of pest problems through design and maintenance practices, and uses a range of pest management techniques, including biological, cultural, and mechanical, with chemical controls as a last resort.”¹⁷

3. King County Recycled Product Procurement Policy. King County has a policy to promote the purchase of “environmentally preferable products.” Preferable alternatives are described by the County as:

“products that have a lesser or reduced effect on human health and the environment when compared with competing products that serve the same purpose. This comparison may consider raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, or disposal of the product.”¹⁸

4. The Smart Growth Initiative. In 2003 King County initiated a program called Smart Growth, designed to encourage low impact development and to reduce the environmental impact of housing projects, as directed by the Built Green Ordinance. Demonstration Smart Growth projects will feature green building construction principles and “emphasize recycled materials, energy efficiency, natural habitat protection, and other environmentally friendly construction practices.”¹⁹

5. Public Education Programs. King County is a recognized leader in public education. The County has received two awards from the Environmental Education Association of Washington (EEAW). The King County Park System won the “Organizational Excellence Award,” and the County’s School and Youth Program of the Local Hazardous Waste Management Program won the “Community Catalyst Award.” King County has also formed a partnership with the nonprofit Nature Vision, which “will keep environmental education classes alive in King County schools.” Effective public education on health and the environment is a critical element underlying the success of the precautionary principle.

Given that Seattle and King County are inclined to use a precautionary approach, including the precautionary principle within their respective Comprehensive Plans would make for more consistent local government. Furthermore, a precautionary approach would ensure that the City of Seattle and King County sustain a high quality environment and protect public health for residents.

¹⁷ See Integrated Pest Management <http://www.metrokc.gov/hazwaste/ipm/>

¹⁸ See King County Recycled Product Procurement <http://www.metrokc.gov/procure/green/policy.htm#1>

¹⁹ See the Smart Growth Initiative http://www.metrokc.gov/ddes/press/press_LIDord.htm. Additional information is also available at the Built Green website - <http://www.builtgreen.net/>.

C. Other Institutions Applying the Precautionary Principle

The following is a partial list of endorsements of the precautionary principle:

- Principle 15 of the Rio Declaration, United Nations Conference on Environment and Development, Rio de Janeiro, 1992. Ratified by the U.S. Government and others.²⁰
- Treaty of the European Union.²¹
- American Nurses Association, October 2003.
- Physicians for Social Responsibility (National PSR).²²
- Washington State Physicians for Social Responsibility (WPSR), 2003.
- SF Precautionary Principle Ordinance, City of San Francisco, 2002.²³
- Los Angeles Unified School District, the second largest district in USA.²⁴
- Berkeley City Council Resolution, October 2003, which also called for the development of a precautionary principle ordinance, beginning with an Environmentally Preferable Purchasing Policy within a year.²⁵

²⁰ Rio Declaration, <http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm>.

²¹ Treaty of the European Union http://europa.eu.int/comm/dgs/health_consumer/library/pub/pub07_en.pdf.

²² National PSR Winter 2001 newsletter, http://www.psr.org/documents/psr_doc_0/program_3/eupdate0101.pdf.

²³ SF Precautionary Principle Ordinance, <http://www.ci.sf.ca.us/sfenvironment/aboutus/policy/legislation/precautionprinciple.htm>

²⁴ Los Angeles Unified School District, <http://www.calisafe.org>

²⁵ See Berkeley City Council meeting minutes, <http://www.ci.berkeley.ca.us/citycouncil/agenda-committee/2003/packet/100603/10-06m.pdf>

Part V: Recommendations for a Policy Framework

A. The City of Seattle Comprehensive Plan

The City's twenty-year Comprehensive Plan Toward a Sustainable Seattle was first adopted in 1994 and guides a range of decisions about growth in Seattle, including land use, transportation, housing, capital facilities and utilities. The City first adopted the Plan in 1994 in response to the state Growth Management Act of 1990. State law requires the City to update the 20-year plan in 2004 and to extend its horizon from 2014 to 2024. The plan will also incorporate new citywide growth targets, as well as update technical appendices and inventories.

The City of Seattle describes its Comprehensive Plan, as “a 20-year policy plan designed to articulate a vision of how Seattle will grow in ways that sustain its citizens values.”²⁶ Environmental concerns are expressed within the plan's Environment Element.

B. King County Comprehensive Plan

The King County Comprehensive Plan is the guiding policy document for all land use and development regulations in unincorporated King County, as well as for regional services, including transit, sewers, parks, trails and open space.²⁷

Environmental issues are specifically addressed in Chapter 4 of the King County Comprehensive Plan. The chapter introduction states:

“Protecting and restoring air quality, water resources, soils, and plant, fish and animal habitats are among King County's primary goals. This chapter establishes policies to protect the environment and enhance the region's high quality of life.”²⁸

C. Proposed Amendment to Seattle and King County Comprehensive Plans

Based on these stated goals of environmental protection, the authors propose the following amendment to the Environment Element of the City of Seattle Comprehensive Plan and Chapter 4 of the King County Comprehensive Plan. The following language would make an explicit connection between ecological health and human health and would direct the City of Seattle and King County to adopt the precautionary principle as a fundamental policy framework for decision-making:

By adopting this amendment, Seattle and King County would incorporate the precautionary principle as one of the City's and County's core values and as a tool for

²⁶ Additional information and the entire Plan is available at the City's website <http://www.seattle.gov/dclu/planning/comprehensive/homecp.htm>

²⁷ See <http://www.metrokc.gov/ddes/compplan/>

²⁸ Chapter 4, “Environment,” of the King County *Comprehensive Plan* can be found at <http://www.metrokc.gov/ddes/compplan/2004/PubRevDraft/Chapter4.pdf>

decision-making. The amendment would amplify existing value statements and policies emphasizing environmental protection without requiring additional resources for the City and County.

Proposed Language

Every resident of Seattle/King County has an equal right to a healthy and safe environment. This requires that our air, water, earth and food be of a sufficiently high standard that individuals and communities can live healthy, fulfilling and dignified lives. The duty to enhance, protect and preserve Seattle's/King County's environment rests on the shoulders of government, residents, resident groups and businesses alike.

A Precautionary Approach

The City/County sees the precautionary principle approach as an integrating element across its policy framework that will result in a healthier Seattle/King County on every level. Establishing and committing to this shared covenant will help ensure the enduring livability and ecological viability of local, regional and global environments. The intent of this effort is to further catalyze Seattle's/King County's commitment to economic, environmental and social sustainability.

A central element of the precautionary approach is the careful assessment of current and potential alternatives using the best available science. The precautionary principle recognizes there is often uncertainty in evaluation of hazards but strives to incorporate an integrated assessment that emphasizes a health-based, whole ecosystem approach. One of the goals of the precautionary principle is to include residents as equal partners in decisions affecting their environment.

The precautionary principle's emphasis on alternatives assessment and public involvement in decision making will enhance the City's/County's ability to make healthier and more sustainable choices — choices which will encourage decision-makers to move beyond finding cures to harm already done and, instead, look to prevent harm to our health and the environment in the first place.

Therefore, the City of Seattle/King County adopts the precautionary principle as a policy framework for decision-making and defines the precautionary principle as follows:

Where threats of serious or irreversible harm to people or nature exist, anticipatory action will be taken to prevent damages to human and environmental health, even when full scientific certainty about cause and effect is not available, with the intent of safeguarding the quality of life for current and future generations.

(End of proposed language).

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<http://www.doh.wa.gov/sboh/Pubs/2001EJReport.pdf>

White Paper - The Precautionary Principle and the City and County of San Francisco, March 2003. Available at: http://www.breastcancerfund.org/pdfs/white_paper.pdf

APPENDIX

A. Suggested Resources

Books

Ted Schettler, Katherine Barrett, Carolyn Raffensperger. "The Precautionary Principle: A Guide for Protecting Public Health and the Environment." In *Life Support: The Environment and Human Health*. Editor Michael McCally. MIT Press, 2002.

European Environment Agency. *Late Lessons from Early Warnings: The Precautionary Principle 1896-2000*. Environmental issue report No. 22, Copenhagen, 2001. A collection of historical case studies recounting environmental and public health disasters such as asbestos and radiation poisoning, fishery depletion, MTBE and mad cow disease. Twelve "late lessons" emerge to guide future preventative policy-making and inform an analysis of the role of science in risk assessment and the precautionary principle. 211 pages.

Available for free download or print copy at:

http://reports.eea.eu.int/environmental_issue_report_2001_22/en.

Hammond, Herb. *Seeing the Forest Among the Trees: the Case for Wholistic Forest Use*. Polarstar Press Ltd.: Vancouver, B.C. Canada. 1991. Describes an ecosystem-based approach to land use planning, which demonstrates a practical case study for implementing the precautionary approach in determining forest use.

Articles

Marchant, Gary E. "From General Policy to Legal Rule: Aspirations and Limitations of the Precautionary Principle." *Environmental Health Perspectives*, Volume 111, Number 14, November 2003 (<http://ehpnet1.niehs.nih.gov/docs/2003/6197/abstract.html>). Discusses the multiple versions of the precautionary principle and argues for a more pragmatic approach in its application.

Brown, Valerie, J. "REACHing for Chemical Safety." *EHP* 111(14), 767-269, November 2003.

"White Paper: The Precautionary Principle and the City and County of San Francisco, 2003. City of San Francisco." Recounts the history of the precautionary principle worldwide and the development of San Francisco's precautionary principle, implemented in March, 2003. Discusses the scientific, ethical and economic implications of the principle with examples from existing precautionary policies. 21 pages. Also available for free download at: www.ci.sf.ca.us/sfenvironment/aboutus/policy/legislation.htm

Meyers, Nancy. "The Precautionary Principle Puts Values First, 2002." An overview of the precautionary principle including its history, definition and implementation. This paper pays particular attention to the values underlying the principle. It also includes a defense against common criticisms of the principle and its current and potential role in

policy-making and enhancing democratic processes. 10 pages. Available for free download at: <http://www.rachel.org/library/index.cfm?St=1>

Landrigan, P.J., Schechter, C.B, Lipton, J.M., Fahs, M.C. and Schwartz, J. “Environmental Pollutants and Disease in American Children: Estimates of Morbidity, Mortality, and Costs for Lead Poisoning, Asthma, Cancer, and Developmental Disabilities.” *Environmental Health Perspectives* Volume 110, Number 7, July 2002, available at www.ehponline.org.

UK Agriculture and Environment Biotechnology Commission (AEBC). “Crops on Trail – A Report by the AEBC.” September 2001, <http://www.aebc.gov.uk/aebc/pdf/crops.pdf>, (see paragraph 118 on the precautionary principle). The AEBC was “set up in June 2000 with a brief to look at the current and future developments in biotechnology which have implications for agriculture and the environment, and to advise the Government on the ethical and social implications and their public acceptability.”

Web Based Resources

“The Science and Environmental Health Network” (SEHN):
<http://www.sehn.org/about.html>

“Seattle's *Comprehensive Plan: A Plan for Managing Growth 1994-2014.*”
<http://www.seattle.gov/dclu/planning/comprehensive/homecpc.htm>

“The Lowell Center - Precautionary Principle Project.” University Massachusetts’ effort to: “refine and enhance understanding of the precautionary principle, and to investigate ways in which the precautionary principle supports sound science as well as social and economic well-being.” <http://sustainableproduction.org/proj.prec.abou.shtml>

“Taking Steps to Be Safe: Precautionary-Based Laws, Policies and Agreements, 2003.” Environmental Health Alliance. A sample list of international, national, state, and local laws, treaties and agreements, and industry initiatives based on the precautionary principle. Arranged in alphabetical order by issue, from Arsenic-treated wood to Toxic Chemicals. 10 pages. Available for free download at <http://www.besafenet.com/>.

The Breast Cancer Fund:
http://www.breastcancerfund.org/pp_main.htm

Center for Health, Environment and Justice, BE SAFE Campaign:
<http://www.besafenet.com/>

Center for a New American Dream. Provides information on procurement strategies:
<http://www.newdream.org/procure/>

Inform. Presents an explanation of extended producer responsibilities:
http://www.informinc.org/epr_00.php

C. Illustrative Case Studies

There are numerous cases of the failure to use a precautionary approach and the subsequent individual and societal consequences. Positive outcomes of the use of the precautionary principle are more difficult to document and less dramatic, as they should occur when one demonstrates a lack of harm and suffering.

Currently, Washington State is dealing with the issue of mad cow disease (bovine spongiform encephalopathy or BSE) and working to determine a more precautionary approach towards preventing harm from the illness. USDA Secretary Ann Veneman gave testimony before the (U.S.) House Agriculture Committee, on January 21, 2004, which presented a precautionary approach to dealing with the crisis at hand. "...We feel very confident that the meat that did enter the food supply posed virtually no risk to public health. However, in an abundance of caution, we traced the meat from the animal and issued a recall of the product..." She further explained the department's decision-making priorities, "...When considering actions to be taken following the find, we repeatedly asked ourselves and our staffs three questions: First and foremost, what, if any, additional actions needed to be taken to further protect public health..." Finally, she emphasized how the agency dealt with public concern, "...We also decided that it was important that we immediately inform the public. I felt then and I still feel very strongly that we have an obligation to the American public and to our industry to be as transparent, timely and accurate as possible in our communication efforts..." This example demonstrates how government agencies are already adopting the precautionary principle as a policy framework, and how this approach can guide agencies and local government in finding positive solutions when dealing with challenging problems, such as mad cow disease.

In the U.S. the best historic example of the use of a precautionary approach occurred in the 1970s, however. The U.S. banned chlorofluorocarbons from aerosol spray cans in 1977, ahead of Europe and before the hole in the ozone layer was detected. The U.S. also banned the practice of using scarpie-infected sheep in animal feed which preempted a large-scale outbreak of mad cow disease. A reviewer in the FDA held up the approval of thalidomide, a drug prescribed to pregnant women, and thus saved countless infants from birth defects.

Europe banned lead from paint decades before the U.S. thus saving many children from the neurobehavioral and adverse effects of lead exposure. Lead has been called the greatest preventable public health disaster of the twentieth century, a disaster that occurred despite knowledge of the impact of lead on the nervous system. The effects of exposure to lead and many other compounds would have been preventable if a precautionary approach had been taken.

The examples of asbestos and benzene are considered below. Those wishing to consider other examples are referred to *Late Lessons from Early Warnings: The Precautionary Principle 1896-2000*, European Environmental Agency, which is available free of charge.

Asbestos

Asbestos, a recognized human carcinogen, has a long and curious history. Asbestos continues to cause serious human health effects and continues to be the subject of legal action against companies that used or produced it. Asbestos is the common name given to a group of six different naturally occurring fibrous minerals, which can be separated into long fibers that can be spun and woven. The material is strong, flexible and resistant to heat, most solvents and acids, making it a very desirable industrial product.

Knowledge of asbestos goes back to the second century B.C.E., but the first recorded use of the word asbestos was in the 1st century C.E. by Pliny the Elder. The fire-resistant properties of asbestos were recognized early and contributed to its derivation from the Greek “sbestos” or extinguishable, thus “a-sbestos” or inextinguishable. The Romans used asbestos to make cremation cloths and lamp wicks, and in the Middle Ages, knights used asbestos to insulate their suits of armor. The use of asbestos increased along with the industrial revolution and the need for a material to insulate steam boilers such as those in locomotives.

The first modern asbestos mine opened in 1879 in Quebec, Canada. Canada continues to be the world’s largest producer of asbestos, followed by Russia, China, Brazil and several other countries. Serious lung disease associated with asbestos inhalation was first described in the early 1900s in England. This disease became known as asbestosis and was fully described in British medical journals in 1924 as young workers died from asbestos exposure. By the early 1930s, dose-related injury, length of time exposed and the latency to response were being well characterized in both Europe and the United States. By the mid and late 1930s the first associations with lung cancer were documented.

In the 1960s the consequences of asbestos exposure for many workers in World War II started to become evident. Several papers published by Irving Selikoff in the 1960s clearly demonstrated the association of mesothelioma with asbestos exposure. Mesothelioma, a cancer of the lining of the lung was found to be almost exclusively associated with asbestos exposure.

Despite overwhelming evidence, in the United States regulation of asbestos exposure only started in the early 1970s with exposure limits decreasing as the serious and latent consequences of asbestos exposure became apparent. White asbestos or chrysotile was used in thousands of consumer products and is common in many older homes. The serious health effects of asbestos exposure have resulted in both regulatory and legal action and in many countries the total banning of the use of asbestos.

The costs of not accepting the serious health consequences of asbestos exposure have been truly enormous. It is estimated that in Europe alone there will be an additional 400,000 deaths related to asbestos exposure. Insurance companies have been forced into bankruptcies as have numerous companies that used asbestos. Even worse, there were adequate substitutes for most uses of asbestos available by the 1970s. A look back indicates that the short-term considerations of the use of asbestos generated many jobs

and high profits, but at what true cost? There was no attempt to apply a precautionary approach and consider the indirect costs to workers and the consumers exposed to asbestos.

Additional information can be found in “Asbestos: From ‘Magic’ to Malevolent Mineral” by David Gee and Morris Greenberg in *Late Lessons from Early Warnings: The Precautionary Principle 1896-2000*. European Environmental Agency.

Benzene

Benzene (C₆H₆) was first isolated from whale oil in 1823 and subsequently synthesized from benzoic acid in 1834. It is a clear, colorless liquid at room temperature and readily evaporates into the air. It is derived from petroleum and is widely used in the production of other products such as rubber, nylon, synthetic fiber, lubricants, glues, detergents, dyes, drugs and pesticides, to name just a few. Worldwide, benzene use and production are measured in the billions of pounds making it one of the top 20 chemicals in use. In the United States, benzene is present in gasoline at about 2% but in other countries may be up to 5%. It is readily absorbed by inhalation.

Human health problems were associated with the first industrial uses of benzene. In 1897 it was reported that young women manufacturing bicycle tires developed aplastic anemia, a bone marrow disease. The use of benzene increased dramatically after WWI as did the incidence of bone marrow disease, or as it was generally called “benzene poisoning.” In 1928 the first case of leukemia was linked to benzene exposure. In 1939 “benzene poisoning” and leukemia was associated with benzene levels of 10 to 25 ppm. This to say nothing of the subtler central nervous system effects, headache, nausea and other symptoms related to benzene exposure.

Despite this information, the American Conference of Governmental Industrial Hygienists recommended a workplace limit of 100 ppm for benzene exposure. In 1957 this was reduced to 25 ppm. Worldwide workplace exposures to benzene continued throughout the 1950s, 60s and 70s. In 1977, even low-level exposure to benzene was linked to the development of leukemia.

Based upon the results of this study the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) proposed a 1 parts per million (ppm) benzene exposure limit. The American Petroleum Institute promptly challenged this decision in the U.S. Court of Appeals, and the 1 ppm limit was disallowed. The case went to the U.S. Supreme Court, which issued what is now known as the “Benzene Decision.” This decision limited OSHA’s ability to limit workplace exposure to benzene and other toxic substances. OSHA was required to find that a “significant risk” was present in the workplace before issuing a ruling. The decision went on to indicate that 1 in 1,000 rather than 1 in 1,000,000 was a “significant risk” of harm. The effective results were that OSHA was required to undertake a prolonged study of recognized harm before issuing a ruling.

The failure to accept the initial exposure limits to benzene proposed by OSHA is estimated to have resulted in over 300 additional worker deaths, while not considering other more subtle effects of higher exposure. In other words, an effort to establish scientific certainty led to needless worker exposure to benzene and subsequent illness. A precautionary approach was clearly warranted in order to protect workers' health. Fortunately, the exact mechanism of benzene causing bone cancer was still to be investigated when in 1987 OSHA established a 1 ppm exposure limit. It is worth reiterating that gasoline contains benzene and warning labels are required—another example of taking a precautionary approach.

Additional information can be found in “Benzene: an historical perspective on the American and European occupational setting” by Peter F. Infante in *Late Lessons from Early Warnings: The Precautionary Principle 1896-2000*. European Environmental Agency.

D. Environment Element – Seattle’s Comprehensive Plan

The following is taken from the initial discussion section of the current Environment Element of Seattle’s Comprehensive Plan, available at:
<http://www.seattle.gov/dclu/planning/comprehensive/homecp.htm>.

“Discussion

The City plays many different roles in preserving, protecting, and enhancing the natural and built environments. First, the City can lead by example, by running its operations in a more environmentally responsible manner.

Second, the City can act as an educator, promoting knowledge and awareness of the environmental impact of personal choices and decisions.

Third, the City can act as an advocate in regional, state and national arenas to promote sound environmental protection.

Fourth, the City can act as a regulator, effectively implementing and enforcing appropriate legal or regulatory requirements, such as through land use and building codes.

Finally, the City can act as a catalyst for business and individuals to improve the environmental outcomes of their activities, by providing technical assistance and incentives for actions that contribute to the City’s environmental goals.

Because this Plan identifies environmental stewardship as one of the City’s core values, the goals and policies in the Land Use, Transportation, Utilities, Housing and Neighborhood Planning elements are at least partially directed at finding environmentally sustainable approaches to growth management in the topics they address. This Environmental Element augments the other elements of this plan by focusing on roles the City can play to protect the environment, beyond what it addresses in those other elements.”

E. WAC 365-195-920 Criteria for addressing inadequate scientific information

Chapter 365-195 WAC GROWTH MANAGEMENT ACT--PROCEDURAL CRITERIA FOR ADOPTING COMPREHENSIVE PLANS AND DEVELOPMENT REGULATIONS,

at <http://www.leg.wa.gov/wac/index.cfm?fuseaction=chapterdigest&chapter=365-195>
and <http://www.leg.wa.gov/wac/index.cfm?fuseaction=Section&Section=365-195-920>.

WAC 365-195-920 Criteria for addressing inadequate scientific information. Where there is an absence of valid scientific information or incomplete scientific information relating to a county's or city's critical areas, leading to uncertainty about which development and land uses could lead to harm of critical areas or uncertainty about the risk to critical area function of permitting development, counties and cities should use the following approach:

(1) A "precautionary or a no risk approach," in which development and land use activities are strictly limited until the uncertainty is sufficiently resolved; and

(2) As an interim approach, an effective adaptive management program that relies on scientific methods to evaluate how well regulatory and nonregulatory actions achieve their objectives. Management, policy, and regulatory actions are treated as experiments that are purposefully monitored and evaluated to determine whether they are effective and, if not, how they should be improved to increase their effectiveness. An adaptive management program is a formal and deliberate scientific approach to taking action and obtaining information in the face of uncertainty. To effectively implement an adaptive management program, counties and cities should be willing to:

- (a) Address funding for the research component of the adaptive management program;
- (b) Change course based on the results and interpretation of new information that resolves uncertainties; and
- (c) Commit to the appropriate timeframe and scale necessary to reliably evaluate regulatory and nonregulatory actions affecting critical areas protection and anadromous fisheries.

F. City of Seattle Endorsement of Earth Charter

On Monday, September 23, the Seattle City Council and Mayor Greg Nickels formally proclaimed that September 28, 2002 would be established as Earth Charter Day and that the City of Seattle would commit itself to embracing the principles of the Earth Charter by "assertively working towards the realization of its aims so that we can assure a healthy future for our community and for our earth."

The Earth Charter has a section that relates to the precautionary principle:
(see: http://earthcharterusa.org/earth_charter.html)

Section 6 of the Earth Charter

6. Prevent harm as the best method of environmental protection and, when knowledge is limited, apply a *precautionary approach* [emphasis added].
 - a. Take action to avoid the possibility of serious or irreversible environmental harm even when scientific knowledge is incomplete or inconclusive.
 - b. Place the burden of proof on those who argue that a proposed activity will not cause significant harm, and make the responsible parties liable for environmental harm.
 - c. Ensure that decision making addresses the cumulative, long-term, indirect, long distance, and global consequences of human activities.
 - d. Prevent pollution of any part of the environment and allow no build-up of radioactive, toxic, or other hazardous substances.
 - e. Avoid military activities damaging to the environment."

Full text of the City of Seattle Announcement

(see - <http://www.ci.seattle.wa.us/news/detail.asp?ID=2914&Dept=28>)

SUBJECT: City of Seattle Becomes the Second Large City in the United States to Endorse the Earth Charter
FOR IMMEDIATE RELEASE:
9/20/2002 11:57:00

City of Seattle Becomes the Second Large City in the United States to Endorse the Earth Charter

Seattle: The City of Seattle has become the second large City in the U.S. (joining Philadelphia), to endorse the Earth Charter. On Monday, September 23, the Seattle City Council and Mayor Greg Nickels will formally proclaim that September 28, 2002 is Earth Charter Day and that the City of Seattle commits itself to embracing the principles of the Earth Charter by "assertively working towards the realization of its aims so that we can assure a healthy future for our community and for our earth."

The Earth Charter was initiated at the 1992 Earth Summit in Rio and is a Declaration of Interdependence that sets forth an integrated and ethical approach to community development based on respect and care for the community of life, ecological integrity, social and economic justice, nonviolence, democracy and peace. The Earth Charter's decade-long drafting has involved the most open and participatory process ever conducted in connection with an international document. It has been shaped by thousands of distinguished people globally, both experts and representatives of grassroots communities, and has been endorsed by governments, organizations and thousands of individuals around the world.

Councilmember Richard Conlin, sponsor of the proclamation, comments, "The Earth Charter helps us locally by connecting our local policies to global objectives. It is a guide for creating achievable sustainable development policies and plans. Seattle has been a leader in making government a model of resource-efficient and environmentally

responsible business practices. It is our goal to continue to be aggressive in our actions.” As stated in the proclamation, Seattle’s Comprehensive Plan is guided by a commitment similar to the Earth Charter, recognizing that “a sustainable culture thrives without compromising the ability of future generations to meet their needs.” Councilmember Conlin adds that the endorsement of the Earth Charter reflects the City’s core values expressed in the City’s Comprehensive Plan, “Community, Environmental Stewardship, Economic Opportunity and Security, and Social Equity.”

Seattle is one of 24 cities in the United States gathering in Earth Charter Community Summits on September 28 to explore ways to promote the Charter and make its principles a more integral part of their communities. “This bold leadership from the City of Seattle adds great strength to the worldwide movement to declare humankind’s responsibility to the greater community of life and to future generations,” says Fritz Hull, Founding Director of Whidbey Institute, and Northwest Coordinator for the Earth Charter. “It will help set the tone for our Community Summit on September 28.”

The local Summit will be held at Bastyr University, 14500 Juanita Drive NE in Kenmore. This free, daylong event will feature a speech by David Korten, author and co-founder of Positive Futures Network. The day will also include discussions, children’s activities and celebrations through music and art. Seattle’s events will be connected via live Internet webcast to the other participating cities. Information and registration for the Summit can be accessed at www.earthchartersummits.org.

G. The Washington State Department of Ecology, Proposed Strategy to Continually Reduce Persistent Bioaccumulative Toxins (PBTs) in Washington State. December 2000. Publication # 00-03-053. Full text available at <http://www.ecy.wa.gov/biblio/0003054.html/>

The following is an excerpt from page 16 of Ecology’s PBT policy strategy:

The precautionary principle is designed to promote a “better safe than sorry” approach for dealing with hazardous substances and technologies. The principle originated in Europe in the early 1970s and appears in more than a dozen international treaties. For example the 1992 Rio Declaration on the Environment and Development states:

“When there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”

The precautionary principle is one of ten principles that the Department of Ecology identified to help guide the development and implementation of the PBT strategy. The Department received numerous comments that both support and oppose including this principle in the revised strategy. Ecology has carefully reviewed those comments and continues to believe it should be included as one of the strategy’s guiding principles. However, based on that review, Ecology believes there are several issues associated with the practical application of the principle that require clarification.

Role of scientific information: measures to address environmental problems must have a sound scientific and policy basis. A rigorous scientific review will be conducted when identifying what substances should be included in the list of PBTs. However, Ecology believes that respect for the limits of our scientific knowledge means that the inability to develop a precise risk assessment value should not be used as a reason to postpone measures to prevent threats of serious, cumulative, and/or irreversible environmental damage.

New and existing sources of PBTs: Once a substance has been identified as a PBT, a full range of response options (e.g. control, prevention, use reduction, phase-out) need to be identified and evaluated. Consistent with many environmental laws, applying the precautionary principle creates a preference for using safer alternatives. However, that presumption can be overcome by considering the technical, economic, and social circumstances surrounding the specific activity.

Cleaning-up historical releases of PBTs: Once a PBT has been released into the environment, cleanup measures must consider the environmental threats posed by the contaminants as well as threats posed by the cleanup measures themselves. Consequently, efforts to clean up historical releases will continue to be guided by risk-assessment/risk-management concepts.

Consistency with current laws and regulations: Most state and federal laws are based on precautionary/preventative approaches to environmental protection. Consequently, applying the precautionary principle is consistent with current laws. This was acknowledged by the U.S. delegation to the recently concluded (December 2000) U.N. Treaty Negotiation on Persistent Organic Pollutants (POPs).