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Issue 1. Is the Precautionary Principle a Sound Approach to Risk Analysis? 2

YES: Nancy Myers, from “The Rise of the Precautionary Principle: A Social Movement Gathers Strength,” *Multinational Monitor* (September 2004) 4

NO: Bernard D. Goldstein, from “The Precautionary Principle: Is It a Threat to Toxicological Science?” *International Journal of Toxicology* (January/February 2006) 13

Nancy Myers, communications director for the Science and Environmental Health Network, argues that because the Precautionary Principle “makes sense of uncertainty,” it has gained broad international recognition as being crucial to environmental policy. Bernard D. Goldstein, professor of Environmental and Occupational Health at the University of Pittsburgh, argues that although the Precautionary Principle is potentially valuable, it poses a risk that scientific (particularly toxicological) risk assessment will be displaced to the detriment of public health, social justice, and the field of toxicology itself.

Issue 2. Is Sustainable Development Compatible with Human Welfare? 22

YES: Jeremy Rifkin, from “The European Dream: Building Sustainable Development in a Globally Connected World,” *E Magazine* (March/April 2005) 24

NO: Ronald Bailey, from “Wilting Greens,” *Reason* (December 2002) 32

Jeremy Rifkin, president of the Foundation on Economic Trends, argues that Europeans pride themselves on their quality of life, and their emphasis on sustainable development promises to maintain that quality of life into the future. Environmental journalist Ronald Bailey states that sustainable development results in economic stagnation and threatens both the environment and the world’s poor.

Issue 3. Should a Price Be Put on the Goods and Services Provided by the World’s Ecosystems? 37

YES: John E. Losey and Mace Vaughan, from “The Economic Value of Ecological Services Provided by Insects,” *BioScience* (April 2006) 39

NO: Marino Gatto and Giulio A. De Leo, from “Pricing Biodiversity and Ecosystem Services: The Never-Ending Story,” *BioScience* (April 2000) 51

John E. Losey and Mace Vaughan argue that even conservative estimates of the value of the services provided by wild insects are enough to justify increased conservation efforts. They say that “everyone would benefit from the facilitation of the vital services these insects provide.” Professors of applied ecology Marino Gatto and Giulio A. De Leo contend that the pricing approach to valuing nature’s services is misleading because it falsely implies that only economic values matter.

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Issue 4. Should North America’s Landscape Be Restored to Its Pre-Human State? 64

YES: C. Josh Donlan, from “Restoring America’s Big, Wild Animals,” *Scientific American* (June 2007) 66

NO: Dustin R. Rubenstein, Daniel I. Rubenstein, Paul W. Sherman, and Thomas A. Gavin, from “Pleistocene Park: Does Re-Wilding North America Represent Sound Conservation for the 21st Century?” *Biological Conservation* (vol. 132, 2006) 72

C. Josh Donlan proposes that because the arrival of humans in the Americas some 13,000 years ago led to the extinction of numerous large animals (including camels, lions, and mammoths) with major effects on local ecosystems, restoring these animals (or their near-relatives from elsewhere in the world) holds the potential to restore health to these ecosystems. There would also be economic and cultural benefits. Dustin R. Rubenstein, Daniel I. Rubenstein, Paul W. Sherman, and Thomas A. Gavin argue that bringing African and Asian megafauna to North America is unlikely to restore pre-human ecosystem function and may threaten present species and ecosystems. It would be better to focus resources on restoring species where they were only recently extinguished.

Issue 5. Should the Military Be Exempt from Environmental Regulations? 82

YES: Benedict S. Cohen, “Impact of Military Training on the Environment,” Testimony before the Senate Committee on Environment and Public Works (April 2, 2003) 84

NO: Jamie Clark, “Impact of Military Training on the Environment,” Testimony before the Senate Committee on Environment and Public Works (April 2, 2003) 95

Benedict S. Cohen argues that environmental regulations interfere with military training and other “readiness” activities, and that though the U.S. Department of Defense will continue “to provide exemplary stewardship of the lands and natural resources in our trust” those regulations must be revised to permit the military to do its job without interference. Jamie Clark argues that reducing the Department of Defense’s environmental obligations is dangerous because both people and wildlife would be threatened with serious, irreversible, and unnecessary harm.

Issue 6. Will Restricting Carbon Emissions Damage the U.S. Economy? 106

YES: **Paul Cicio**, from “Competitiveness and Climate Policy: Avoiding Leakage of Jobs and Emissions,” testimony before the House Committee on Energy and Commerce Subcommittee on Energy and Environment (March 18, 2009) 108

NO: **Eileen Claussen**, from “Competitiveness and Climate Policy: Avoiding Leakage of Jobs and Emissions,” testimony before the House Committee on Energy and Commerce Subcommittee on Energy and Environment (March 18, 2009) 118

Paul Cicio argues that lacking global agreements, capping greenhouse gas emissions of the industrial sector will make domestic production less competitive in the global market, drive investment and jobs offshore, increase exports, and damage the economy. The real greenhouse gas problem lies with other sectors of the economy, and that is where attention should be focused. Eileen Claussen argues that environmental regulations have little impact on trade patterns and that though controlling greenhouse gas emissions will affect industrial production, most of the impact will come from a decline in consumption.

UNIT 3 ENERGY ISSUES 131**Issue 7. Should We Drill for Offshore Oil? 132**

YES: **Stephen L. Baird**, from “Offshore Oil Drilling: Buying Energy Independence or Buying Time?” *The Technology Teacher* (November 2008). 134

NO: **Mary Annette Rose**, from “The Environmental Impacts of Offshore Oil Drilling,” *The Technology Teacher* (February 2009). 140

Stephen L. Baird argues that the demand for oil will continue even as we develop alternative energy sources. Drilling for offshore oil will not give the United States energy independence, but the nation cannot afford to ignore energy sources essential to maintaining its economy and standard of living. Mary Annette Rose argues that the environmental impacts of exploiting offshore oil—including toxic pollution, ocean acidification, and global warming—are so complex and far-reaching that any decision to expand U.S. oil drilling must be based on more than public opinion driven by consumer demands for cheap energy, economic trade imbalances, and politics.

Issue 8. Is Carbon Capture Technology Ready to Limit Carbon Emissions? 148

YES: **David G. Hawkins**, from “Carbon Capture and Sequestration,” Testimony before the House Committee on Energy and Commerce, Subcommittee on Energy and Air Quality (March 6, 2007) 150

NO: **Charles W. Schmidt**, from “Carbon Capture & Storage: Blue-Sky Technology or Just Blowing Smoke?” *Environmental Health Perspectives* (November 2007) 161

David G. Hawkins, director of the Climate Center of the Natural Resources Defense Council, argues that we know enough to implement large-scale carbon capture and sequestration for new coal plants. The technology is ready to do so safely and effectively. Charles W. Schmidt argues that the technology is not yet technically and financially feasible, research is stuck in low gear, and the political commitment to reducing carbon emissions is lacking.

Issue 9. Is It Time to Put Geothermal Energy Development on the Fast Track? 171

YES: **Susan Petty**, from testimony on the National Geothermal Initiative Act of 2007 before the Senate Committee on Energy and Natural Resources (September 26, 2007). 173

NO: **Alexander Karsner**, from testimony on the National Geothermal Initiative Act of 2007 before the Senate Committee on Energy and Natural Resources (September 26, 2007). 179

Susan Petty, president of AltaRock Energy, Inc., argues that the technology already exists to greatly increase the production and use of geothermal energy. Supplying 20 percent of U.S. electricity from geothermal energy by 2030 is a very realistic goal. Alexander Karsner, Assistant Secretary for Energy Efficiency and Renewable Energy at the U.S. Department of Energy, argues that it is not feasible to supply 20 percent of U.S. electricity from geothermal energy by 2030.

Issue 10. Should Cars Be More Efficient? 186

YES: **David Friedman**, from “CAFE Standards,” Testimony before Committee on Senate Commerce, Science and Transportation, March 6, 2007 188

NO: **Charli E. Coon**, from “Why the Government’s CAFE Standards for Fuel Efficiency Should Be Repealed, Not Increased,” The Heritage Foundation Backgrounder #1458, July 11, 2001 196

David Friedman, Research Director at the Union of Concerned Scientists, argues that the technology exists to improve the fuel efficiency standards for new cars and trucks and requiring improved efficiency can cut oil imports, save money, create jobs, and help with global warming. Charli E. Coon, Senior Policy Analyst with the Heritage Foundation, argues that the 1975 Corporate Average Fuel Economy (CAFE) program failed to meet its goals of reducing oil imports and gasoline consumption and has endangered human lives. It needs to be abolished and replaced with market-based solutions.

Issue 11. Are Biofuels Responsible for Rising Food Prices? 202

YES: **Donald Mitchell**, from “A Note on Rising Food Prices,” The World Bank Development Prospects Group (July 2008) 204

NO: **Keith Kline, Virginia H. Dale, Russell Lee, and Paul Leiby**, from “In Defense of Biofuels, Done Right,” *Issues in Science and Technology* (Spring 2009) 212

Donald Mitchell argues that although many factors contributed to the increase in internationally traded food prices from January 2002 to June 2008, the most important single factor was the large increase in biofuels production from grains and oilseeds in the U.S. and EU. Keith Kline, Virginia H. Dale, Russell Lee, and Paul Leiby argue that the impact of biofuels production on food prices is much less than alarmists claim. There would be greater impact if biofuels development focused on converting biowastes and fast-growing trees and grasses into fuels.

Issue 12. Is It Time to Revive Nuclear Power? 222

YES: Iain Murray, from “Nuclear Power? Yes, Please,” *National Review* (June 16, 2008) 224

NO: Kristin Shrader-Frechette, from “Five Myths About Nuclear Energy,” *America* (June 23–30, 2008) 231

Iain Murray argues that the world’s experience with nuclear power has shown it to be both safe and reliable. Costs can be contained, and if one is concerned about global warming, the case for nuclear power is unassailable. Professor Kristin Shrader-Frechette argues that nuclear power is one of the most impractical and risky of energy sources. Renewable energy sources such as wind and solar are a sounder choice.

UNIT 4 FOOD AND POPULATION 241

Issue 13. Are Improved Aid Policies the Best Way to Improve Global Food Supply and Protect World Population? 242

YES: Robert Paarlberg, from “Evaluating, and Improving, America’s Response to Global Hunger,” testimony before the Senate Committee on Foreign Relations Hearing on “Alleviating Global Hunger: Challenges and Opportunities for U.S. Leadership” (March 24, 2009) 244

NO: Lester R. Brown, from “Could Food Shortages Bring Down Civilization?” *Scientific American* (May 2009) 252

Professor Robert Paarlberg argues that global hunger, which afflicts nearly a billion people worldwide, many of them in Africa, calls for increased aid directed toward agricultural education, science, and research, and infrastructure development. Lester R. Brown argues that the problem is due more to water shortages, soil losses, rising population, and rising temperatures from global warming than to failures of aid policies. What is needed is immediate attention to the world’s environmental problems, lacking which the result will be increased hunger, political conflict, and perhaps even the collapse of civilization.

Issue 14. Is Genetic Engineering the Answer to Hunger? 262

YES: Gerald D. Coleman, from “Is Genetic Engineering the Answer to Hunger?” *America* (February 21, 2005) 264

NO: Sean McDonagh, from “Genetic Engineering Is Not the Answer,” *America* (May 2, 2005) 268

Gerald D. Coleman argues that genetically engineered crops are useful, healthful, and nonharmful, and although caution may be justified, such crops can help satisfy the moral obligation to feed the hungry. Sean McDonagh argues that those who wish to feed the hungry would do better to address land reform, social inequality, lack of credit, and other social issues.

Issue 15. Can Organic Farming Feed the World? 274

YES: Catherine Badgley, et al., “Organic Agriculture and the Global Food Supply,” *Renewable Agriculture & Food Systems* (June 2007) 276

NO: John J. Miller, from “The Organic Myth,” *National Review* (February 9, 2004) 286

Catherine Badgley, et al., argue that organic methods could produce enough food to sustain a global human population that is even larger than today’s, and without requiring additional farmland. Organic agriculture would also decrease the undesirable environmental effects of conventional farming. John J. Miller argues that organic farming is not productive enough to feed today’s population, much less larger future populations; it is prone to dangerous biological contamination; and it is not sustainable.

UNIT 5 TOXIC CHEMICALS 295

Issue 16. Should DDT Be Banned Worldwide? 296

YES: Anne Platt McGinn, from “Malaria, Mosquitoes, and DDT,” *World Watch* (May/June 2002) 298

NO: Donald R. Roberts, from Statement before the U.S. Senate Committee on Environment & Public Works, Hearing on the Role of Science in Environmental Policy-Making (September 28, 2005) 306

Anne Platt McGinn, a senior researcher at the Worldwatch Institute, argues that although DDT is still used to fight malaria, there are other, more effective and less environmentally harmful methods. She maintains that DDT should be banned or reserved for emergency use. Donald R. Roberts argues that the scientific evidence regarding the environmental hazards of DDT has been seriously misrepresented by anti-pesticide activists. The hazards of malaria are much greater and, properly used, DDT can prevent them and save lives.

Issue 17. Do Environmental Hormone Mimics Pose a Potentially Serious Health Threat? 317

YES: Michele L. Trankina, from “The Hazards of Environmental Estrogens,” *The World & I* (October 2001) 319

NO: Michael Gough, from “Endocrine Disrupters, Politics, Pesticides, the Cost of Food and Health,” *Daily Commentary* (December 15, 1997) 325

Professor of biological sciences Michele L. Trankina argues that a great many synthetic chemicals behave like estrogen, alter the reproductive functioning of wildlife, and may have serious health effects—including cancer—on humans. Michael Gough, a biologist and expert on risk assessment and environmental policy, argues that only “junk science” supports the hazards of environmental estrogens.

Issue 18. Is the Superfund Program Successfully Protecting Human Health from Hazardous Materials? 334

YES: Robert H. Harris, Jay Vandeven, and Mike Tilchin, from “Superfund Matures Gracefully,” *Issues in Science & Technology*, Summer 2003, Vol. 19, Issue 4 336

NO: Randall Patterson, from “Not in Their Back Yard,” *Mother Jones* (May/June 2007) 340

Environmental consultants Robert H. Harris, Jay Vandeven, and Mike Tilchin argue that although the Superfund program still has room for improvement, it has made great progress in risk assessment and treatment technologies. Journalist Randall Patterson argues that the Superfund Program is not applied to some appropriate situations, largely because people resist its application.

Issue 19. Should the United States Reprocess Spent Nuclear Fuel? 349

YES: Phillip J. Finck, from Statement before the House Committee on Science, Energy Subcommittee, Hearing on Nuclear Fuel Reprocessing (June 16, 2005) 351

NO: Charles D. Ferguson, “An Assessment of the Proliferation Risks of Spent Fuel Reprocessing and Alternative Nuclear Waste Management Strategies,” from Testimony before the U.S. House of Representatives Committee on Science and Technology Hearing on Advancing Technology for Nuclear Fuel Recycling: What Should Our Research, Development and Demonstration Strategy Be? (June 17, 2009). 357

Phillip J. Finck argues that by reprocessing spent nuclear fuel, the United States can enable nuclear power to expand its contribution to the nation’s energy needs while reducing carbon emissions, nuclear waste, and the need for waste repositories such as Yucca Mountain. Charles D. Ferguson, Phillip D. Reed senior fellow for science and technology at the Council on Foreign Relations, argues that even though reprocessing can help reduce nuclear waste management problems, because as currently practiced it both poses a significant risk that weapons-grade material will fall into the wrong hands and raises the price of nuclear fuel (compared to the once-through fuel cycle), it should not be pursued at present.

Issue 20. Does Commercial Fishing Have a Future? 370

YES: Carl Safina, from “A Future for U.S. Fisheries,” *Issues in Science and Technology* (Summer 2009) 372

NO: Boris Worm et al., from “Impacts of Biodiversity Loss on Ocean Ecosystem Services,” *Science* (November 3, 2006) 378

Carl Safina argues that despite an abundance of bad news about the state of the oceans and commercial fisheries, there are some signs that conservation and even restoration of fish stocks to a sustainable state are possible. Boris Worm and colleagues argue that human activities, including overfishing, so threaten marine biodiversity that before the mid-twenty-first century, populations of all those ocean fish currently sought will be so reduced that commercial fishing will have ended.

Issue 21. Is Global Warming a Catastrophe That Warrants Immediate Action? 385

YES: Global Humanitarian Forum, from *Climate Change—The Anatomy of a Silent Crisis* (May 2009) 387

NO: Bjorn Lomborg, from “Let’s Keep Our Cool About Global Warming,” *Skeptical Inquirer* (March/April 2008) 391

The Global Humanitarian Forum argues that global warming due to human activities, chiefly the emission of greenhouse gases such as carbon dioxide, is now beyond doubt. Impacts on the world’s poorest people are already severe and will become much worse. Immediate action is essential to tackle climate change, increase funding for adaptation to its effects, and end the suffering it causes. Bjorn Lomborg argues that although global warming has genuine impacts on people, the benefits of continuing to use fossil fuels are so much greater than the costs that the best approach to a solution is not to demand draconian cuts in carbon emissions, but to invest globally in research and development of non-carbon-emitting energy technologies and thereby “recapture the vision of delivering both a low-carbon and a high-income world.”

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