COLORADO'S ENVIRONMENTAL MANAGEMENT SYSTEM PERMIT PROJECT

March 2003

I. EXECUTIVE SUMMARY

The Colorado Department of Public Health and Environment ("CDPHE") is embarking on an environmental project that could permanently change the way state regulatory agencies and the U.S. Environmental Protection Agency conduct regulatory and enforcement work. The goal of the project is to develop a system that allows an environmental management system (EMS) to act as a cross-media permit for certain regulated entities. If successful, the project will allow government to be more efficient and better leverage resources – a critical aim given today's state budgetary challenges. In addition, those entities participating in the project will pilot a new approach for meeting regulatory obligations that will be rewarded through added flexibility and incentives for meeting and exceeding environmental goals.

Problem Statement.

The past 30 years of environmental regulation have resulted in considerable improvements in environmental protection, and probably made sense at that time. Environmental regulations have matured and have largely achieved the outcomes promulgated by Congress in the environmental air, water and waste acts. Further tightening of regulatory standards for some sources already controlled under current environmental laws will yield less environmental and public health benefit for each dollar invested. In addition, rigid command-and-control requirements provide little incentive for companies to go beyond minimum regulatory compliance requirements. Innovation and alternative, less costly environmental protection activities are discouraged as technology-based standards tend to be "fixed-in-time" and do not easily accommodate continual environmental improvement.

In fact, a panel, commissioned by the National Academy of Public Administration in 1995, concluded that the nation's system for protecting the environment was "broken," in that it: (1) did not address high risk problems, (2) did not respond to environmental problems that crossed environmental media, and (3) was failing to draw on problem-solving capacities of the states, cities, and the private sector.[1] In 2000, the Academy found that the system is still broken for these same reasons.

II. WHAT PRACTICAL PROBLEMS ARE CREATED BY THE CURRENT REGULATORY SYSTEM?

The current regulatory system, based on command and control regulations, is rife with barriers that discourage innovation. Companies are frustrated by traditional requirements that act as obstacles to innovation and improved environmental performance, and ultimately sustainability.

Failure to Consider Cross-Media Impacts.

The current regulatory process does not allow for the consideration of cross-media impacts and control strategies. This type of restriction often results in shifting pollution from one medium to another without actually reducing the amount of pollution entering the environment.

[1] National Academy of Public Administration (NAPA), *Setting Priorities, Getting Results* (1995), 6.

Over the years, a number of inconsistencies illustrate the need for moving to a cross-media regulatory system.

(1) The Clean Water and Clean Air Acts, for example, require the U.S. Environmental Protection Agency to establish technology-based discharge rate limits based on “available” or “feasible” emission control technologies. Such standards discourage pollution prevention by emphasizing or even requiring “end-of-pipe” compliance solutions instead of process or other pollution prevention solutions.

(2) A wastewater treatment plant or a manufacturing pretreatment system may extract hazardous air pollutants before discharging into a receiving body of water. The resulting sludge generated by its pollution control process creates a hazardous waste that must be disposed of in a landfill. A comprehensive analysis of the entire system, taking cross-media impacts into consideration may identify an alternative approach or a different technology that generates a non-hazardous waste that may be sufficient to recycle as an alternative raw fuel in, for example, a cement kiln or as a by-product in the manufacturing of cement.

(3) A refinery, pursuant to the Clean Air Act, was required to install a wet gas scrubber to remove nitrogen oxide from the emission stream. The scrubber was estimated to remove 99 percent of the pollutant. The scrubber, however, was estimated to increase the use of energy and water, and to generate wastewater and hazardous waste. Using a cross-media approach, an alternative technology could be implementation of a catalytic converter. A catalytic converter would obtain a removal efficiency of 95 percent for nitrogen oxides and no wastewater or hazardous waste would be generated. In addition, significantly less energy and water would be used. The spent or used catalyst could then be shipped to a Portland cement plant for use in cement manufacturing.

Under existing regulatory standards, the catalytic converter is not likely to be approved as the best achievable control technology because its efficiency in capturing nitrogen oxide was a few percent less than the scrubber. But, the entire environmental balance sheet of the scrubber has a much greater negative environmental impact.

(4) In Colorado, state-only swine regulations have resulted in inefficiencies and cross-media impacts. Water Quality Control Commission Regulation No. 61 requires swine producers to meet stringent agronomic and soil testing requirements prior to land applying process effluent from lagoons. The effluent has nutrients, as well as water, that farmers can utilize for crops. In order to demonstrate the agronomic rate has not been violated, swine producer must conduct expensive soil testing on each 60-acre interval two to four times a year. In addition, since the farmers have been applying commercial fertilizer for years, and will continue to do so, the soils in certain fields are above the agronomic rate. Therefore, swine producers are unable to provide the effluent to farmers as a nutrient and source of water and must find additional land that will meet the requirements for land application.

To avoid the requirements of the water quality regulation, swine producers are building more lagoons for storage and evaporation of the process wastewater. New lagoons require additional fresh water to be added to the impoundment to meet the Air Quality Control Commission’s Regulation No. 2 lagoon cover requirement. The fresh water requirements are difficult to meet during dry years and during the evaporation process, valuable nutrients and water are wasted.

The end result is: (1) farmers will continue to apply commercial fertilizers and hope to secure sufficient water resources from other sources for crops; (2) swine producers will spend thousands of dollars to build new evaporative lagoons to evaporate wastewater instead of land applying; (3) air pollution, in the form of volatile organic compounds, will increase due to the evaporation of effluent containing process wastewater and the nutrients will be lost; and (4) swine operators will likely violate the air quality "cover" requirement because evaporative lagoons are designed to go dry.

These examples all support the need for a performance-based cross-media approach. This approach would comprehensively consider water and air quality, waste disposal and water quantity issues within the context of an interconnected holistic or biological system.

Mandated Technologies.

Prescriptive regulations that mandate the use of specific techniques or technologies to meet pollutant limitations can lead to economic inefficiencies and discourage implementation of environmentally beneficial alternatives. For example, a company may be required to install an air stripper at significant cost in order to remove volatile organic compounds from the air stream. The organic volatile compounds are captured in wastewater. Wastewater is then sent to a wastewater treatment plant where the volatile organic compounds are volatilized and emitted to the air. The money spent on the stripper technology could be put to better use within the facility.

Failure to Incorporate Flexibility into Permit Process.

At times, regulatory processes limit economic growth for states. In order to stay competitive, certain industries, like the pharmaceutical industry, need to change processes and products quickly due to changing market demands. Permit requirements, however, require modifications to be made to the permit prior to making a physical change.

The current permitting process is often protracted and discourages companies from moving forward with continual improvement projects. Permit modifications can take anywhere from a few weeks to nine or more months to process. In Colorado, for example, a research and development company developed a revolutionary new AIDS drug, which the Federal Food and Drug Administration approved within a one-week period. In order to provide pharmaceutical companies with the capacity to develop the new drug for commercial sale, pharmaceutical companies need to be able to make physical modifications quickly. If such modifications result in an increase in air emissions, a permit modification is required. Again, permit processing can take weeks to months.

In this scenario, flexibility to allow such changes can be worked into air permits when the permit is first drafted and, if the permit engineer has the time, resources and willingness to accept the degree of risk associated with allowing increased flexibility in the permit. In this particular example, Colorado included the necessary flexibility in the permit so the drug could be manufactured and brought to market without regulatory delay.

Limited Resources.

Governmental entities must ensure the state is meeting national and state environmental goals while balancing new and changing environmental issues that may not fit into existing regulations. As resources become further stretched for both regulatory agencies and the regulated

community, we are all forced to do more with less. In response, regulators are beginning to identify methods to focus efforts on the most important issues (including methods to identify the regulated entities that require less oversight). The regulatory system should do the same for the regulated community. Currently, the environmental health and safety professionals at U.S. companies spend a considerable amount of time on administrative work and process. This administrative burden significantly reduces a company's ability to improve efficiencies, reduce costs and solve environmental problems.

In addition, the current regulatory process does not include adequate incentive-based elements to encourage continued environmental improvements. Beyond corporate commitments to environmental improvement, companies are given little incentive through the current system to continue to improve. There is no greater flexibility, streamlined permit process, or reduction in risk of penalties for companies committed to continual improvement. In fact, the existing regulatory process can impair the ability of companies to move towards continual improvement. A company that wants to capture methane from a wastewater treatment facility, for example, may elect not to do so since the air quality permit process is so burdensome. The result is that a valuable energy resource is released into the air and a new energy source is foregone.

II. WHAT IS THE SOLUTION?

Stepping outside the box and thinking differently about the way the environmental agencies regulate, inspect and enforce environmental laws can achieve a higher level of protection for the general public and the environment. The tool Colorado believes can move the industry in this direction is a comprehensive performance-based environmental management system (EMS).

An environmental management system is a formal set of procedures and policies that define how an organization will manage its environmental responsibilities. In general, an environmental management system creates a systematic framework to identify, prioritize, manage, mitigate and document the environmental impact a facility creates through its activities, products and services.

An environmental management system is not a new concept, but Colorado's approach is. Since the 1970s, many companies developed environmental plans and procedures to help manage environmental responsibility. Some companies began experimenting with environmental management systems in the late 1970s. IBM and 3M, for example, began implementing portions of an environmental management system over 25 years ago.[2] It was not until 1996, however, when widespread recognition of environmental management systems became mainstream in European countries and in the United States.

At the international level, the impetus of change was driven by the publication of a voluntary environmental management system adopted by the International Organization for Standardization and commonly referred to as the ISO 14001 standard. Since passage of the ISO 14001 standard, a growing number of businesses are adopting ISO 14001 or similar environmental management systems. In Colorado, CDPHE will take an environmental management system one step further by using the EMS as both a comprehensive management tool and as a facility's environmental (multimedia) permit.

[2] Darnall, Nicole, Rigling Gallagher, Deborah, Andrews, Richard N.L. and Amaral, Deborah. *Environmental Management Systems: Opportunities for Improved Environmental and Business Strategy*. Reprint of an article for publication in *Environmental Quality Management*. Wiley Publishers, 2000.

III. COLORADO'S PROPOSAL

Recognizing the beyond compliance philosophy and goals some companies consistently demonstrate, the State of Colorado is seeking to implement a pilot program that would add to the current permit structure a more flexible approach to meeting environmental standards. The program would allow an EMS to act as an enforceable cross-media permit.

In general, Colorado's project will evaluate and determine whether a carefully-tailored enforceable EMS permit can: (1) be developed to serve as a cross-media permit, (2) establish appropriate performance-based standards in lieu of command-and-control technology requirements, and (3) explore and offer other flexibility measures. Flexibility as to how to meet performance-based standards will be provided to the project participant, based on their business needs and market approaches. The project anticipates a facility's commitment to continual environmental improvements, compliance or beyond compliance by the regulated entity and even environmental improvements, which can include non-regulated environmental impacts (e.g., carbon dioxide emissions, noise, or odors), annual third-party audits, and enhanced community involvement. CDPHE anticipates that this project will result in reduced oversight for participating facilities, and will allow project partners to consider cross-media impacts and benefits in decision making. The project anticipates greater involvement of the community and greater quality and quantity of information provided to the public and to CDPHE through the annual third-party audits.

This program does not contemplate either a relaxation in CDPHE's enforcement program nor a dismantling of the current regulatory structure. The intent is to broaden the existing regulatory structure to allow for greater regulatory flexibility, less frequent inspections and increased permit flexibility. CDPHE recognizes, however, that there is great variability in how well the regulated community manages environmental responsibilities. Some businesses are leaders, setting standards of excellence for their peers, and at the other end of the spectrum, some have difficulty meeting even the most basic requirements. An EMS would promote environmental stewardship and at a minimum, would ensure that by resolving one environmental problem another more serious environmental problem is not created.

The goals of CDPHE's EMS permit program include:

- Utilizing an EMS to deliver at least enforceable compliance-equivalent performance into the future;
- Reliance on an EMS with specific, CDPHE-approved performance improvement goals to achieve continual environmental improvement;
- Continuation of CDPHE's selective policy that offers rewards and incentives to good performers that have used or want to add an EMS approach;
- The appropriate allowance for stakeholder involvement in a participant's environmental footprint and community relations situation;
- The consideration of cross-media impacts when making environmental decisions; and
- Finding ways to have the regulated organizations' EMS efforts replace some of government's environmental regulatory functions, including inspections through external third-party audits, minor permit modifications through the EMS tracking system, and

reporting through the EMS data collection, problem identification, root cause analysis, system modification processes.

The success of this project depends upon working with partners that are committed to compliance and that can demonstrate a commitment to continual environmental improvement. Project partners must develop and implement an ISO-like EMS that is reviewed and approved by CDPHE. The EMS must include a requirement for annual third-party audits that will be conducted by CDPHE-approved or certified auditors. Auditors will audit both the system and for regulatory compliance of the facility.

Project partners must be committed to specific annual environmental goals that are beyond-compliance (compliance is baseline). The types of environmental improvements a partner may select are included in Attachment A (this is not an exhaustive list). The project also requires the partners to adopt a strategic communicative management style that includes effective community involvement in the development of this initiative. Included in the dialogue are issues such as environmental impact decisions and community's perceptions and reactions to changes to operations, processes, continuous environmental improvement and implementation of pollution prevention plans that are meaningful. It does not mean, however, involvement by the community in business decisions, fiscal matters, proprietary information, etc.

The strategic communicative management style will include the development of written environmental policies with commitments from top management to superior environmental performance, planning that takes into account environmental aspects and impacts, compliance with legal requirements, objectives and targets, and corporate-wide environmental programs. The environmental policy will focus on identifying structure and responsibility, training and communication for employees, EMS documentation and control, operational control and emergency preparedness and responses, checking and corrective action which include monitoring and measurement, corrective and preventive action, regular EMS audits and a pollution prevention plan.

IV. MEASURING SUCCESS

CDPHE is committed to modifying existing regulatory requirements including: eliminating the traditional single-media permits (the EMS shall be the required environmental permit), using performance-based standards in lieu of technology-based standards, evaluating overall environmental performance of a regulatory decision from a cross-media perspective versus a media by media approach, streamlining reporting and monitoring requirements, and reducing or eliminating inspections. Additional operational flexibility possibilities include: consideration of alternative monitoring and enhanced corrective actions; reduced reporting/decreased administrative expense; annual discharge monitoring reports; wastewater noncompliance notifications; electronic reporting/submittals; storm water permit classification; and single cross-media inspections at a reduced frequency.

Gauging the success of this innovative concept depends on the ability of CDPHE and project partners to measure environmental performance or results. Performance measures may include:

- Environmental performance measures (e.g., measures of emissions of pollutants, risk factors, use of energy and natural resources, etc.);

- Environmental condition indicators (measures of environmental quality in relation to the facility and its discharges, e.g., substantiate the well-being of the air, land, water and living things as part of a larger eco-system);

- Environmental compliance indicators (specify and describe deficiencies in terms of unauthorized releases and government requirements);

- Pollution prevention indicators (include pollution prevention performance information and what stakeholders believe are the priority pollution prevention actions);

- Cost/benefit measures and environmental cost accounting for the financial benefits; and

- Community involvement measures (identify ways the facility has played a leadership role in involving the public in defining goals and objectives and how it has incorporated public insights and recommendations).

V. CONCLUSION

A new way of thinking about a tried and tested comprehensive system, an EMS, can permanently change the way environmental regulations are applied at the state and federal level if proven successful. The EMS permit offers an approach to overcoming some of the limitations of the existing regulatory structure while helping the regulated community make sound business decisions for the environment - decisions that result in greater gains for both the environment and for public health. By working together, proactive companies and the State of Colorado can drive regulatory change at both the federal and state level that is highly efficient and lasting.

Attachment A

Examples of Environmental Improvements

- For a power plant, energy recovery projects, e.g., re-use of fly ash as an alternative combustion fuel – reduce coal use by a negotiated amount of tons/year and generate a certain amount MWh/year from recovered fly ash (measurement: tons of coal displaced by recovered ash; megawatt-hours of energy recovered from ash that was previously put in a landfill).

- Conduct industrial ecology projects (e.g., beneficial re-use of high-volume industrial wastes in construction materials).

- Commitments to opacity limits well below the current regulatory requirements (measurement: opacity as read by continuous emission monitors or using other methods).

- Improved land use and reduced risk of environmental contamination through commitments to reduce solid and hazardous waste sent to landfills and find beneficial uses. Eventual goal is to completely eliminate waste streams to landfills. A second goal is to reduce risk and potential liability for groundwater contamination caused by leaching or leaking of materials from the landfills. (Measurement: volume of waste diverted and landfill space made available.)

- Performance of baseline environmental performance audits and annual reviews thereafter for the duration of the agreement. Key findings and follow-up actions shall be communicated to the interested stakeholder group. (Measurement: number of findings, corrective actions, and time periods required for corrective actions.)

- Implementation of an Environmental Management Information System plant-wide to assist plant and corporate staff in planning, tracking, and reporting on environmental activities and performance. (Measurement: percent implementation.)

- EMS audits of all key suppliers that may present significant environmental aspects as part of the service they provide the plant using ISO 14001 like protocols. Feedback will be supplied to the suppliers. (Measurement: list of audits conducted and qualitative and quantitative performance measures specific to the company's contract with each supplier.)

- Projects that can demonstrate better overall environmental performance, with the allowance for higher medium-specific emissions standards.