

STATE EXPERIENCE INTEGRATING POLLUTION PREVENTION INTO PERMITS

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Disclaimer

This report was prepared by Research Triangle Institute for EPA, Office of Air Quality Planning and Standards. The report consists of a review of the efforts different states are making to incorporate pollution prevention into their environmental permitting programs and an evaluation of the effectiveness of these efforts. By sponsoring such a review, EPA is not endorsing or discouraging use of these types of efforts. This document is not official EPA guidance. This document provides insight into the innovative and creative efforts that states are making to promote pollution prevention through environmental permits in all media. It is hoped that providing this information will spur other states and EPA to adopt techniques that seem effective and appropriate. It is also hoped that this information will provide a starting point for discussion of pollution prevention in permitting, which has traditionally been based on pollution control.

Information for this report was gathered from published documents and conversations with parties involved. State agency personnel were given the opportunity to review a summary of the information they provided, and any comments were incorporated into the text.

This review is not a comprehensive survey of all state efforts. This is primarily due to time and budget constraints. Omission of particular state efforts certainly does not imply judgement as to its usefulness.

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Executive Summary

In its implementation of the Clean Air Act Amendments of 1990 (CAAA), the EPA is seeking ways to promote pollution prevention. The CAAA's Title V creates an Operating Permits program that requires facilities to have all of their federal and state air requirements and compliance schedules within one document, known as the operating permit. These permits do not contain new requirements beyond those already mandated by state and federal law. Permits are one of the primary vehicles by which environmental law and policy are applied to industry.

To explore how pollution prevention (P2) can be integrated with the Title V program, EPA's Office of Air Quality Planning and Standards (OAQPS), which is responsible for developing regulations under the Act's Title V Operating Permits provisions, established two pilot projects. These projects explored how pollution prevention and operational flexibility could be integrated with permits issued to a pharmaceutical firm (Merck) and a semiconductor manufacturer (Intel). In addition to EPA's efforts, many states are examining ways of promoting pollution prevention and providing operational flexibility to facilities.

In support of these pilot projects and its other efforts to investigate ways to integrate P2 with the Title V program, EPA tasked Research Triangle Institute (RTI) to review existing national, state and local efforts to integrate P2 into permits and to assess the effectiveness of these efforts. However, the scope of this report does not address how OAQPS could promote the promising efforts identified here and elsewhere.

RTI found that many states were testing out ideas for using their permitting activities to promote P2, including efforts in all stages of the permit life, from pre-issuance to inspection and enforcement. For the most part, systematic qualitative or quantitative evaluations of these efforts were not available. On the next page, we summarize the major types of P2 integration efforts that were identified.

Summary of Efforts to Promote P2 in Permits

Permit Flexibility

This report gives examples of two ways to provide flexibility under a permit:

- 1) allowing the facility to make changes as long as it remains within an emissions cap and;
- 2) allowing the firm to make preapproved changes without applying for a permit modification.

The permits reviewed in this category were all pilot studies or applied to special industry sectors. If the EPA and states can adequately enforce these flexible permits then these permits could provide permitted facilities the ability to respond much more quickly to market conditions.

Pollution Prevention Planning

Mandatory P2 planning is in use in many states: incorporating it into permits may increase the scope of the facilities that are affected by P2 planning requirements. Planning is likely to be more effective if it is used in advance of obtaining a permit, rather than afterwards, when resources may have been expended on pollution control strategies. However, in the special case of firms who are receiving source-specific determinations of control during which it is found that control devices are too costly for that source, requiring the facility to create a P2 plan as a permit condition could promote P2 in a situation which would otherwise remain uncontrolled.

Mandatory P2 planning for good operating practices and maintenance, and even requiring certification that some good operating practices are being used, seems particularly promising. In part this approach is promising because good operating practices are relatively inexpensive and usually effective P2 measures. New Jersey's experience with the asphalt manufacturers industry provides a strong example of the potential success of this type of approach.

Consideration of P2 for Compliance with Permit Limits

Mandatory consideration of P2 for compliance may be effective to direct firms' attention to P2, but efforts to promote P2 for compliance must be coupled with efforts to remove regulatory barriers to using P2 for compliance. EPA and the states need to develop more experience finding enforceable ways to allow firms to use P2 measures to meet emissions limits and technology-based limits. Attention to special projects like the Intel flexible permit project will provide further insight on the viability of P2-based approaches to compliance.

Offering Extended Compliance Schedules to Facilitate Pollution Prevention

Use of extended compliance schedules for firms that want to use P2 for compliance can be a valuable tool in situations where more time is needed to facilitate implementation of a P2 option for compliance.

Reduced Permit Fees for Firms Using Pollution Prevention

Offering reduced fees or alternative monitoring to firms that reduce their emissions through P2 can be an effective incentive for firms to explore and implement P2. Like all incentives, however, it will only work to the extent that firms and regulators are aware of it, understand it, and thus are willing to use it.

Promoting Pollution Prevention through Permit Inspectors

Use of permit inspectors to promote P2 can be effective. Inspectors who are observing potential violations and can point these out along with ways to use P2 to avoid such violations are likely to be able to get the attention of a facility. Care must be taken to avoid potential confusion about when inspectors are acting in their role as enforcement personnel and when they are offering non-mandatory suggestions. In addition, P2 at the inspection stage should not be emphasized at the expense of steps taken earlier in the facility's operation under a permit.

Incorporating P2 into Underlying Rules

Incorporation of P2 into underlying rules and elimination of P2 disincentives can be an effective way for EPA to promote P2, not just at pilot facilities but at all facilities affected by the rule. Including explicit permission to use P2 for compliance with a rule sends a strong message, and removes disincentives for facilities and regulators to build P2 into their operating permits.

1 Introduction

In its implementation of the Clean Air Act Amendments of 1990 (CAAA), the EPA is seeking ways to promote pollution prevention. The CAAA's Title V creates an Operating Permits program that requires facilities to have all of their federal and state air requirements and compliance schedules within one document, known as the operating permit. These permits do not contain new requirements beyond those already mandated by state and federal law. Permits are one of the primary vehicles by which environmental law and policies are applied to industry.

To explore how pollution prevention (P2) can be integrated with the Title V program, EPA's Office of Air Quality Planning and Standards (OAQPS), which is responsible for developing regulations under the Act's Title V Operating Permits provisions, established two pilot projects. These projects explored how pollution prevention and operational flexibility could be integrated with permits issued to a pharmaceutical firm (Merck) and a semiconductor manufacturer (Intel). In addition to EPA's efforts, many states are examining ways of promoting pollution prevention and providing operational flexibility to facilities.

In support of these pilot projects and its other efforts to investigate ways to integrate P2 with the Title V program, EPA tasked Research Triangle Institute (RTI) to review existing national, state and local efforts to integrate P2 into permits and to assess the effectiveness of these efforts. Discussion of the approaches provides a conceptual framework for understanding where P2 can fit into environmental permits. This review of available techniques may help EPA and states to identify ideas to explore further. However, the scope of this report does not address how OAQPS could promote the promising efforts identified here and elsewhere.

To conduct this study, RTI gathered information by contacting federal and state regulators and other individuals who had experience with P2 in permits. RTI attempted to identify the major tools being used to promote integration of P2 into permits for air and other media, but did not attempt to identify every initiative that addressed P2 in permits. References to further sources of information about integration of P2 in permits are provided, and references to literature or published information about P2 in permits are contained within the text of this report, even where we were unable to speak to individuals to obtain an evaluation of the work.

To a certain degree, activities to promote P2 through permits were a matter of attempting to ensure that permits do not create a disincentive to P2. For example, a facility that has a P2 idea may find that it requires a permit modification to implement this change. If the change triggers New Source Review (NSR) under the Clean Air Act, the facility may be required to undergo significant review of its proposed change under complex NSR regulations. NSR may dictate that the facility install best available control technology (BACT) even where the P2 change that the facility proposes will reduce actual emissions. This problem has been addressed to some extent in EPA guidance on NSR reform which applies an NSR exemption to pollution control or

pollution prevention projects, but the exemption is not broad, and there are projects which fit the EPA definition of P2 that may not fall under the NSR guidance (USEPA, 1994).

RTI found that many states were testing out ideas for using their permitting activities to promote P2, including efforts in all stages of the permit life, from pre-issuance to inspection and enforcement. For the most part, systematic qualitative or quantitative evaluations of these efforts were not available. The following approaches to integration were identified:

- ▶ Providing flexibility to allow facilities to make P2-oriented changes without needing a permit modification
- ▶ Providing for facility level P2 planning by incorporating the planning process into the permit application procedure
- ▶ Providing for facility level P2 planning by requiring a facility to develop a P2 plan as a condition of the permit
- ▶ Including P2 conditions in permit
- ▶ Providing information on ways to use P2 for compliance with permit limits
- ▶ Multimedia Permits as a way to promote P2
- ▶ Modified permit fee structures to provide incentives for P2
- ▶ Providing accelerated permit review as an incentive for P2-related applications and modifications
- ▶ Providing extended compliance time for facilities who use P2 as compliance method
- ▶ Allowing alternative monitoring as an incentive for P2
- ▶ Promoting P2 through permit inspections
- ▶ Incorporating P2 into the rules on which permit limits are based

This report describes research methods and summarizes information gathered by RTI to characterize and analyze current efforts by states to integrate P2 into their permitting activities.

In gathering information, RTI attempted to ascertain whether P2-integration in permits efforts had been followed by qualitative or quantitative evaluations of the effectiveness of the effort in terms of quantity of pollutants reduced as a result of the P2 condition in the permit, or in terms of whether removal of P2 disincentives had led to increased use of P2. This kind of evaluation is almost universally absent from these efforts. Thus, the information provided in this report about the success of efforts to integrate P2 into permitting is anecdotal.

In addition to not having adequate evaluative efforts built into them, often P2-in-permits efforts have been implemented as pilots or on a case-by-case basis, thus anecdotal assessments are not based on a large sample of experiences.¹

¹ One state agency representative said that he wished more states and EPA Regions would begin implementing their own pilot programs in addition to calling him to ask how his pilot project is going.

What is Pollution Prevention?

Pollution prevention is defined as source reduction and other practices that reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water or other resources, or protection of natural resources by conservation. Source reduction includes any practice which reduces the amount of any hazardous substance or pollutant prior to recycling or treatment, including equipment or technology modifications, process modifications, reformulation or redesign of products, substitution of raw materials and improvements in housekeeping, maintenance, training or inventory control.

Pollution prevention explicitly does not include add-on controls like thermal oxidizers, wastewater treatment processes and scrubbers that have traditionally been the basis for compliance with operating permit limits under air and water environmental protection programs.

Some Common Examples of P2

P2 Through Modification of Process Equipment

Use of alternative spray equipment for applying finishes to products can reduce the quantity of coatings materials needed for a given product. Two common alternative spraying methods are high volume, low pressure nozzles and air-assisted airless application equipment to replace conventional air atomized spray systems. Reducing materials use is one of the characteristics of effective P2 (since the more of the material that is used is incorporated into the finished product, less waste is produced). This also saves money for the manufacturer.

P2 Through Good Operating Practices and Preventative Maintenance

Good operating practices and preventive maintenance can prevent pollution in a number of ways. The State of New Jersey recommends that asphalt manufacturers employ P2 techniques like conducting annual burner adjustments and examination of dryer flights. These promote clean burning and thus reduce emissions (New Jersey, 1994). Good operating practices for other industries might include frequent inspection of pipes for leaks (early repair of leaks can reduce chemical or water waste); improved inventory control to reduce the quantity of materials that go out of date; and placing covers on dumpsters and other sources of potential stormwater contamination.

P2 Through Materials Substitution

Substitution of less-hazardous or less-polluting materials for hazardous ones is a common P2 technique. Many firms are switching away from chlorinated solvents like trichloroethylene in favor of alternatives like aqueous cleaning. Materials substitution is not a panacea, however. For instance, switching from solvents to aqueous cleaning can eliminate a hazardous air pollutant problem, but create additional burdens on wastewater treatment facilities or the local publicly owned treatment works.

Pollution Prevention Through Planning

A pollution prevention plan is an ongoing assessment of the firm's waste and pollution generation. This first step in the P2 process involves investigating the wastes that are generated, identifying areas in which those wastes can be reduced, and the costs associated with the wastes. Planning for P2 is the first step in implementing P2. P2 plans may be simple and focus on reducing or eliminating one substance (like reducing solvent use or reducing plating sludge generation) or they may be more detailed and look at all wastes from the facility. Facility P2 assessment guides like EPA's "Facility Pollution Prevention Guide" can facilitate the P2 planning process (EPA 1992).

2 Integration of P2 into Permitting: Different Approaches

Information about the specific efforts and their effectiveness is presented in the following sections. The efforts undertaken by states have been grouped under 12 headings, each corresponding to a different way of approaching the P2 integration problem. A description of the type of approach is provided, followed by examples of how the approach is applied in the different states identified by this report. Table 1 summarizes the different efforts described, and shows how well-established the effort is in the state.

2.1 Permit Flexibility

There is the perception in the regulated community that lack of flexibility in operating permits prevents them from implementing beneficial changes, including some P2 changes (Inside EPA, 1995). A facility's permit often specifies in detail the equipment and/or chemicals that will be used for a given process. Making a change in their process to implement P2, like switching to a lower-VOC coating process could trigger the need to apply for a permit modification or even to comply with New Source Review requirements.

Various EPA and state efforts have tried to incorporate flexibility into permits to overcome this disincentive. Some of these efforts have the objective of specifically removing a disincentive to P2 or to innovation. In other cases, a permitting agency may be able to offer a flexible permit in exchange for the facility undertaking P2 projects that they might not otherwise have done. Here we examine examples of permit flexibility through 1) preapproval of certain changes and 2) emissions caps that set an overall plantwide limit but provide latitude in how these limits are met.

2.1.1 Pre-Approved Changes

One way to remove a disincentive for P2 is to preapprove certain changes so that a facility is not required to go through the process of permit modification when it chooses to make these changes. This may provide flexibility so that the facility can react quickly to market conditions to make changes as needed. It may also be a way for a permitting agency to encourage specific kinds of P2 changes.

Some flexibility is already available in the existing air permit process nationwide in that facilities in their application can provide for alternative operating scenarios. A permit that incorporates these alternatives allows the facility to move between these scenarios as needed without applying for permit modification. The State of Delaware, for instance, routinely solicits as many operating scenarios as possible because they want to avoid having to process permit modifications (A. Farrell, Del. DNREC, personal communication). Often, however, firms do not apply for different operating scenarios in their permits, possibly because to do so can require substantial additional

TYPE OF P2 INTEGRATION EFFORT USED	ORGANIZATION														
	CA	DE	U.S. Region 9	IL	IA	MA	MN	NC	NJ	NY	OAQPS, CTG	OR	TX	WV	WI
Flexibility									1A			4	2		
Planning in Permit Application														1A	
Planning as a Permit Condition									1A,3						1A
P2 Conditions in Permit							4		1A						
Providing P2 Information for Compliance					2	2									
Multimedia Permits		4A				3			4A	4A					
Modified Fees Structures							5								1
Accelerated Review, Extended Compliance	4			2											3
Alternative Monitoring								2			2,6				
P2 Promotion Through Inspectors			5												
P2 in Underlying Rule					2, 1A			2							

Code

- 1) Consistently applied to all permits issued by relevant agency
- 1A) Consistently applied to all permits in some subset of facilities
- 2) Available to all permit applicants/holders if they request it or meet certain conditions
- 3) Applied on a case -by-case basis
- 4) One-time use or used in pilot project
- 4A) Pilot project, very early implementation or planning
- 5) Still a conceptual stage
- 6) In EPA Guidance

Table 1

The x-axis shows the state involved in the effort.
The y-axis shows the type of P2-integration effort being used.
The code in the matrix shows how well-established the effort is.

work (P. Lloyd, NC DEM, personal communication). The flexibility provided by the alternative operating scenarios is also limited to the scenarios that are foreseeable at the time of permit application, whereas a firm engaged in a highly dynamic field (e.g., pharmaceuticals or computers) may be continually updating its processes.

The EPA, in recognition of the need for flexibility, has released a proposed rule for Title V programs that explicitly provides for preapproved changes (EPA 1995a). The pre-approved changes can help facility streamline the paperwork they must do when they want to make changes, as can building alternative operating scenarios under existing air permits. Preapproval of very specific changes, like the New Jersey example described below, and building alternate operating scenarios into the permit both are limited to changes that are foreseeable at the time of permit issuance. Provisions like those in the Intel draft permit that provide parameters for pre-approved changes, but do not prescribe them are likely to provide more flexibility. It may be difficult to apply the concept of pre-approved changes widely in Title V permits because the types of changes will vary industry by industry or even site by site, and it could be quite time-intensive for permit writers to attempt to develop such conditions for every permit.

Examples of Using Pre-Approved Permit Changes to Create Flexibility

Oregon

The draft Intel Title V permit (discussed at page 4) preapproves changes at the facility within certain limits. Intel may increase its maximum capacity to emit VOCs if:

- ▶ The increase is offset by emission reductions achieved through the facility's pollution prevention plan (see discussion below);
- ▶ Permitted air pollution control devices are not changed nor performance degraded;
- ▶ The numerical VOC emissions per unit product prescribed under the facility-specific Reasonably Available Control Technology (RACT) rules are not violated;
- ▶ The P2 "good operating" practices prescribed under the facility-specific RACT are not violated;
- ▶ Source-specific compliance monitoring is not affected
- ▶ No new applicable requirement is triggered

Because the Intel facility has not been operating under the draft permit, it is impossible to tell whether its preapproved changes have had the effective of boosting P2. The Oregon DEQ noted that these preapprovals have the effect of approving the changes that the state "would have approved anyway," thus they remove a needless obstacle. Intel is required to file notice of the changes with the department (G.Yun, ODEQ, personal communication).

The limitation that preapproved changes must stem from the facility's required P2 plan provides coherence between the requirements of the permit; it clearly indicates that the P2 plan should not be a paper exercise but should be a tool used by the facility to reduce emissions. It also has the effect of providing preferential regulatory treatment to P2 changes.

New Jersey

New Jersey has incorporated pre-approved changes into permits for auto plants. Existing manual painting operations are pre-approved to convert to robotic spray (which is generally considered to be more efficient and is a P2 measure). This is applicable to only two facilities in the state, and information about whether they have taken advantage of the preapproval was not available (New Jersey, 1994).

Facilities participating in New Jersey's pilot facility wide permit program may make changes without state approval if the change is developed through a pollution prevention plan and the change does not increase emissions into air or water, does not cause an increase in generation of waste per unit of production, and does not add a new process. Only one facility is currently operating under this type of permit, thus it is too early to say whether the nexus between the P2 plan and flexibility will have the desired effect (S.Anderson, NJDEP, personal communication).

Minnesota

3M and the state of Minnesota used pre-approved permit changes as a way to reduce the disincentives for P2 at the 3M plant in St. Paul (Style, 1994). Changes to production lines can be undertaken and are listed in the permits. 3M is required to notify the state agency before making a listed change and after the change is implemented; it can propose unlisted changes that are consistent with the listed ones, and if approved, can operate under the same permit. This lets the facility incorporate P2 changes and process improvements that let it increase production without requiring a permit modification.

2.1.2 Emissions Caps

Bubbles and emissions caps are another way that states have attempted to create permit flexibility. Bubbles and emissions caps work by setting limits on total emissions of various pollutants from a whole facility rather than prescribing a limit for every source of the pollutant in the facility. This enables the facility to choose the most efficient method of achieving their overall allowable level, perhaps by over-reducing emissions at one source while under-reducing at another. These reductions can be made with P2 or with treatment technologies, so emissions caps do not inherently promote P2. Nevertheless, they may remove a disincentive to take P2 measures.

Flexibility under emissions caps can be used as a reward for facilities who implement P2. It is

not clear whether enforcement of emission caps will be more difficult due to the increased complexity of calculating the total emissions from all sources under the cap.

Examples of Bubbles or Emissions Caps

Texas

The Texas Natural Resource Conservation Commission, New Source Review Section, began accepting applications for flexible permits in 1994. They have received 10 applications so far and have approved two flexible permits. The flexible permits are based on an emissions cap or multiple emissions caps for a particular site. This program is not designed with a pollution prevention objective. Rather it is designed to ease the administrative burden on firms and thus to encourage firms that have been “grandfathered” in the air program to obtain permits in exchange for emissions reductions based on best available control technology (BACT) (S.Hildebrand, personal communication).

Minnesota

The Minnesota Pollution Control Agency has proposed a pilot project under the EPA’s Project XL² that uses emissions caps to promote flexibility. The state proposes to work with facilities to develop multimedia permits in which facilities agree to emissions reductions that are beyond the levels required by existing regulation. In exchange, the state will give them greater operating flexibility using an emissions cap. One pilot is underway with the 3M plant in Hutchinson, Minnesota. Others may be forthcoming if the state’s proposal to Project XL is approved (Project XL, 1995).

2.2 P2 Planning Incorporated Into Permit

A pollution prevention plan is a written document that identifies sources of significant wastes and/or emissions at a facility and identifies measures that can be taken to prevent the generation of those wastes and pollutants. Many states have instituted a requirement that certain industries prepare facility P2 plans. These states do not require implementation of the P2 plans. The rationale behind requiring planning but leaving implementation up to the individual firm is that by forcing firms to analyze P2 options, firms will become aware of opportunities to save money and reduce waste through P2 and will take those opportunities that are feasible.

P2 planning components can be incorporated into environmental permits either by requiring a P2 plan as part of the permit application or by requiring that the facility develop a P2 plan

² Project XL is a voluntary EPA national pilot program designed to foster innovation in industrial environmental protection. As of this writing, pilot sites are being screened, but it is likely that some of the pilots will involve improvements in the permit process.

within the first year or so of permit issuance. The program may require either submission of that plan or certification of progress toward the goals of that plan.

P2 plans in permits potentially overlap or duplicate state mandatory planning requirements in states that have such legislation. P2 plans in permits, however, differ from state planning laws in that:

1. P2 planning laws in most states apply to large quantity generators of hazardous waste. It is unclear at this time how many facilities that will need Title V permits fall within that category.
2. P2 planning that is incorporated into permits may become part of the public record, while in many state planning laws, the plan is confidential, and is kept on site, or a “clean” executive summary is submitted to the state.
3. P2 planning requirements incorporated in permits often focus attention on one or two regulated substances of particular concern, rather than being broadly drafted as many state mandatory planning laws are. For instance, RTI reviewed some Wisconsin water discharge permits that targeted specific toxics, and some that targeted only chlorides. P2 planning requirements in permits tend to be media specific as well -- planning in air permits focuses on compliance with air limits, but they may make reference to the desirability of avoiding cross-media transfer of pollutants.

The overall effectiveness of mandatory P2 planning is unclear (both within the permit process and in other state laws). Rozell and Brower (1993) conclude that Oregon’s general P2 planning law has been very successful with large companies and less so for smaller facilities. They base that assessment on compliance with planning requirements, interest in training and technical assistance and other correspondence with industry, but they note that it is not possible to currently measure the direct reductions attributable to the requirement. P2 planning conditions in the permit may be a useful way to direct facility attention at P2 approaches to compliance, particularly where the facility is not otherwise subject to a statewide P2 planning requirement. Planning requirements that take effect after the permit is issued may be useful where it is not immediately clear what P2 measures the facility might take as part of the permit. If the permit writers can spot obvious P2 avenues, then they may be able to incorporate a planning condition to require the facility to evaluate that avenue.

Mandatory P2 planning as a component of permit application has the advantage of drawing a facility’s attention to P2 early in the process, rather than after they have drawn up a permit application that relies on pollution control. However, incorporating a P2 plan in an application creates potential public access to the plans, creating a disincentive for facilities to participate in such planning (Anderson and Herb, 1994).

Examples of Use of P2 Plans in Permit Context

Oregon

The draft Intel permit provides that after issuance of the permit, the facility shall create a pollution prevention plan. The permit lists specific required elements that must be in the plan. The planning process is given impetus in that preapproved changes in the permit (discussed above at page 10) are tied to the pollution prevention plan under the permit.

New Jersey

In New Jersey's pilot permit issued to the Schering corporation, the state struggled with ways to set individual limits based on the facility's P2 plan. New Jersey points out that incorporating the state P2 planning process into the permit application process moves the permit process towards a more integrated view of facility data, rather than basing P2 plans on one set of numbers and regulatory compliance on a second set of numbers (S.Anderson, NJDEP, personal communication).

Other permits in New Jersey require P2 planning after the permits are issued. Asphalt manufacturers are required to conduct P2 plans. These are primarily based on maintenance and good operating practices. The permittees are required to submit forms to the state quarterly showing that they have taken some preventive maintenance or good operating practice steps during that quarter. This requirement was developed in conjunction with the industry trade group, and has been very successful (L.Mikolajczyk, NJDEP, personal communication).

Wisconsin

Some Wisconsin Water Pollution Discharge Elimination permits contain requirements that the facility develop P2 plans that target chloride discharges. These are being applied to permits in the dairy sector and for POTW permits with the specific goal of reducing chloride emissions in anticipation of statewide chloride standards. The permits prescribe certain elements of the plans, but no review of quality is made by the department. This is a relatively new effort, so no assessment of P2 promotion is possible, but the industry in general is reportedly "pretty receptive" to drawing up the plans (R.Larson, WDNR, personal communication).

2.3 Evaluating a P2 Option for Permit Compliance

One of the ways that states have attempted to incorporate P2 into permits is to require permittee to evaluate P2 measures as a compliance option before considering control strategies. This has the effect of strongly stating the state's preference for P2 as a compliance strategy. It also may be able to create an environment where P2 is not viewed as optional or as a special effort, but is an integral part of thinking about process design.

Requirement of consideration of P2 before compliance may be an effective way to direct a facility's attention towards P2 if they traditionally have used pollution control to meet regulatory standards. There may, however, be regulatory barriers to use of P2 for compliance, that will interfere with application of the P2 methods the firm identifies. For instance, there may be concerns by the EPA regions or the state about the enforceability of using certain P2 measures for compliance.

Industry is likely to be interested in information about reducing emissions to levels that allow them to reduce their regulatory review. One major stumbling block to such an approach in the Clean Air Act may arise when facilities try to use P2 to qualify as a synthetic minor. If the P2 measures they want to take cannot be prescribed as federally enforceable limits, they may have to go through the full Title V permit review process. Although there is some question about whether EPA is allowed to require federal enforceability of limits as a precondition to reduce review for synthetic minors, it may remain an impediment at the state level unless states begin widely incorporating enforceable P2-obtained limits into permits (National Mining Association et al. v. EPA).

A second barrier to use of P2 to meet permit limits may occur in the situation where a P2 measure which will effectively reduce the facility's actual emissions still increases their potential to emit. If the potential to emit is above applicable thresholds, it will trigger New Source Review (NSR) under the Clean Air Act and may create a conflicting requirement to install best available control technology (BACT). Even if BACT is not required, the NSR process is complex and can be time consuming.

Examples of Evaluation of a P2 Option for Compliance

Oregon

Intel's draft permit requires it to manage all its air emissions using a pollution prevention approach. Once they begin operating under the permit, they will also develop a series of measurement indicators that will be used to generate data on whether "P2 first" is an effective or feasible management option for air emissions (Pollution Prevention Northwest, 1994).

West Virginia

West Virginia's State air toxics rule requires facilities to consider source reduction before looking at control for their required top-down evaluation of best available technology (BAT). The state required a demonstration that source reduction had been considered before it issued permits for control devices at affected facilities. This program affected 26 companies when the air toxics rule was implemented. The state offered technical assistance to the companies, and worked with them before their permit submission. West Virginia found the process to be very successful, and reports large air toxics reductions at individual facilities through P2 (R. Atkinson, WVAPCA, personal communication).

Minnesota

In the permit for Artistic Finishes, a wood finishing facility in Minnesota, the company is directed to conduct a study of P2 approaches to reducing VOC emissions. If the company's study identifies acceptable substitutes for VOC-containing materials, then a schedule for the implementation of these becomes an enforceable part of the permit. If no acceptable substitutes are identified, then the permit directs that company to institute control based-approaches (WRITAR, 1994).

New Jersey

New air regulations in New Jersey require facilities to consider P2 before they consider pollution control options. The P2-consideration-first requirement was also instituted in the permit issued to Schering Plough under the state's pre-pilot multimedia permit efforts. That permit has only been in effect since December 1994, and the air regulations since 1995. Thus is it too early to tell if more P2 is occurring than previously. Nevertheless, the state believes that it is an important incentive to push firms towards bringing P2 thinking into how they do business (S.Anderson, NJDEP, personal communication).

2.4 P2 Conditions as Part of Permit

In addition to requiring the consideration of P2 possibilities, it is also possible to incorporate more specific P2 conditions into an operating permit. The research for this report identified three major mechanisms for incorporating P2 as a permit condition:

- 1) The permit could specify certain P2 measures that a facility is required to take (e.g., annual adjustment of burners to ensure efficient combustion).
- 2) Where P2 is being used to meet permit limits, these P2 measures can be written into the permit in the same way pollution control measures would be incorporated into a permit.
- 3) where a facility has gone beyond compliance, in special arrangements with the permitting authorities, the permit may codify this.

The prescription of P2 conditions in permits is contrary to the premise that often accompanies P2 policy in this country that P2 should be a voluntary effort and every company is the best judge of the most effective P2 choices for its own facility. P2 conditions in permits can be made more flexible by requiring only that the facility investigate P2 and implement those options that make sense at that facility. This may be particularly effective in industries where P2 measures have not been widely implemented. In such a situation, wider use of good operating practices and preventive maintenance can have significant impact on emissions and

hazardous waste generation at relatively low costs.³

Where P2 compliance options are offered in a regulation, then enforcement of those options through a permit is appropriate, since the company has already made the choice to use this form of compliance rather than using control. Indeed, integration of enforceable options to use P2 as a compliance mechanism under the normal regulatory structure has the potential to provide added flexibility to industry in their choice of compliance options and to remove the over-reliance on end-of-pipe treatment.

Examples of Including P2 Conditions in a Permit

New Jersey

Asphalt manufacturers in New Jersey are both required to have plans for reducing carbon monoxide and hydrocarbon emissions and to report quarterly on good operating practices that they are using. This requirement was implemented in consultation with the industry trade association as part of a request by the state that industry show progress towards emissions goals for the industry (New Jersey, 1994).

Indiana

P2 conditions are prescribed in permits for VOC sources who are using materials substitution to comply with Indiana's non-control technology guideline RACT standard. The P2 condition requires the facility to document reduction in use of VOC-containing materials, and it is analogous to the reduction documentation required when using pollution control devices to achieve the required reductions (J.McCabe, IDEM, personal communication).

Minnesota

The 1991 permit for Sheldahl, a manufacturer of electronic circuitry in Minnesota contains a P2 condition in the form of a required phase-out of methylene chloride (dichloromethane) facility wide. The levels were capped in 1991, and a schedule for a facility-wide phase out instituted (Style, 1994). It is anticipated that the reductions will be achieved through a combination of prevention and substitution of a non-chlorinated VOC. The permit does not, however, specify that these are the methods that must be used.

³ It is often assumed that if a P2 practice is profitable, that industry would already be taking advantage of it. Experience has shown that this is not always true. There are still many facilities that can profit from application of P2, and which might not investigate these options without incentives or requirements.

2.5 Providing P2 Information in Permit Application Process

Provision of technical P2 support and information in the permit application process is an additional mechanism that states can use to promote P2. Provision of information at the time of permit application can be an effective mechanism to promote P2. Rozell and Brower (1993) found that most facilities want and need compliance assistance more than they need help with pollution prevention planning under Oregon's P2 Planning Law. This finding suggests that compliance assistance targeted to P2 may be welcomed in the regulated community as well as provide an opportunity to promote P2. It is also clear from discussions with states in the course of this research that the earlier in the permit process that a state can suggest P2, the more likely it is to be effective.

It may, however, be a challenge to find ways to use P2 to comply with some rules. Often standards are written from a pollution-control viewpoint, as in the case of the non-Control Technology Guideline RACT standard in Indiana, described at page 23. In that situation, the EPA wanted the RACT standard to be written to reflect reductions achieved with pollution control rather than reduction in use of VOCs. Examples of P2-friendly standards are provided at page 25.

Examples of Provision of P2 Information in Permit Application Process

Indiana

Indiana's Compliance Technical Assistance Office presented seventeen Title V permit workshops which included discussion of use of P2 for compliance. The staff who ran the workshops for Indiana felt that this effort had been very successful, and that when they began talking about using P2 for compliance after discussing the control options, "you could just see the little light bulbs going on over people's heads" (T.Neltner, IDEM, personal communication).

Massachusetts

Massachusetts and Indiana have included information about P2 opportunities in materials distributed with their Title V applications or notices, and responders were referred to state technical assistance offices where appropriate. Since these notices went out relatively recently, it is too early to tell whether firms are using P2 in their permit application planning. Indiana is in the process of developing statewide P2 measures that might provide some insight into how effective such efforts have been, although it will be difficult for them to attribute reductions to one or another of their specific programs (D.Gallagher, formerly with MA DEP; T.Neltner, IDEM, personal communications).

2.6 Multi-Media Permits

Currently, most environmental operating permits are issued on a single media basis. The use of multimedia permits might be able to eventually replace these sometimes-conflicting or duplicative requirements with a single standard for environmental protection. Multimedia permits may also reduce cross-media transfers of pollutants, which is a goal of P2. The concept of multimedia permitting is not exclusively directed at P2, but conceptually it could be a tool to leverage P2 in permits.

For instance, in permit application process, a multimedia team of permit writers can more easily point out cross-media transfer problems, the cross-media impacts of control or prevention efforts for one media. Including a pollution prevention specialist on that team (as Massachusetts has done) can further promote P2 (D.Fine, Mass. DEP, personal communication). On the other end of the spectrum, multimedia permits may be just an administrative convenience, as is the case at some Massachusetts disposal facilities which use multimedia permits as a way of coordinating duplicative requirements, particularly for solid waste and air.

The multimedia permit process is just beginning in many states. As with any new concept, there seems to be a steep “learning curve,” leaving questions about what the effectiveness of these efforts will be over the long term. The EPA will be following up with various multimedia permit efforts and will be subjecting them to a series of evaluative examinations (N.Roy, USEPA, personal communication). This effort over the next one or two years will hopefully provide good guidance on the strengths and weaknesses of such an approach.

Examples of Multimedia Permits

New Jersey

New Jersey has issued one facility-wide permit under its pilot multimedia permit program. This program explicitly requires a combination of the facility’s media permits with its P2 plan (New Jersey has a state mandatory facility planning law). The state has tried to set emissions limits based on the data collected for the P2 plan. In this way, it feels that the emissions limits make more sense, and the P2 plan is made more meaningful (S.Anderson, NJ DEP, personal communication).

New York

New York State is in the planning phase of a multimedia environmental permit to promote P2. New York believes that seeing the multimedia impacts of compliance requirements through a multimedia permit can help a facility prioritize areas for P2 action as well as point out opportunities for P2 (J.Higgins, NYDEC, personal communication).

Delaware

The State of Delaware is beginning a pilot multimedia permit process which will integrate a pollution prevention assessment as part of the permit application. The State will assist the facility in the P2 assessment and work with the facility to eliminate various waste streams or reduce them below permitting levels (A.Farrell, DNREC, personal communication).

2.7 Permits Fees Structures

One mechanism for promoting P2 in permits is to offer reduced permit fees to facilities that demonstrate that they are implementing P2 into their permitted activities. Firms currently pay a fee per ton of pollutant generated for air pollutants, so there is a “built-in” incentive for reduction. Likewise, many states are exploring the use of general permits under the Title V program; these would allow certain smaller emitters to avoid the full facility-specific permit application process, and simply register their operations. This too would be an incentive to bring emissions down below the threshold of the limit for general permits. The incentive of reduced fees is more likely to be effective in situations where the P2 measures that can be taken to meet thresholds are relatively inexpensive.

Examples of Use of Permits Fee Structures to Promote P2

Wisconsin

Wisconsin has successfully used reduced fees in combination with reduced reporting requirements to promote P2 through its stormwater permits. Firms that can show uncontaminated stormwater runoff (almost entirely obtainable by P2 measures like covering a dumpster or keeping potential contaminants away from stormwater) can reduce their annual fee by \$100 or \$200 annually. The Wisconsin program, described on page 23, also offers reduced monitoring to sites that substantially reduce the contamination in their runoff. This program has been heavily promoted by the state and industry was involved in developing it. The combination of reduced fees, reduced reporting and extensive promotion of P2 in the Wisconsin stormwater program has induced many firms to spend well more than the cost of the fees to implement P2 practices that would allow them to have uncontaminated runoff (R.Larson, WI DNR, personal communication).

Minnesota

Minnesota is considering use of hazard-based fees as a TUR-incentive. This would go beyond the uniform reduction incentive provided by per-ton fees on air pollutants, and instead would scale the cost per ton to match the potential harm. In theory, the result should be a preferential reduction of the most hazardous substances first. The state has undertaken analysis to ascertain the political feasibility of such a move. A survey shows that this would be politically

acceptable to their survey sample. The state is following up with further study (Minnesota Pollution Control Agency, 1994).

2.8 Accelerated Permit Review

Firms often complain that they are reluctant to make production changes that would require a permit modification because the time to approve such a modification would make the project infeasible. Providing accelerated review for permit modifications that involve P2 projects may remove one disincentive to making P2 changes. For many permits, however, there may be mandatory public notice periods that would hinder a state's ability to accelerate the permit review time.

Examples of Accelerated Permit Review

California

An EPA-state program in California (Project MERIT) offered expedited review of air permit modifications if the focus of the permit change was P2. They considered the demonstration successful, and achieved their goal of demonstrating that it could be done. However, continuing work on this kind of preferential review was set aside in favor of work on more comprehensive streamlining of permitting procedures in California (D.Reich, U.S. EPA, personal communication).

Illinois

The State of Illinois has offered expedited review for the past two years for permit modification applications that incorporate a P2 component. The state has a formal mechanism for submitting a request for expedited review. The determination that the permit does contain P2 is made by staff from the Office of Pollution Prevention. The formal process has not been used often, but an informal process is relatively common. In the informal process, the facility that wants to make a P2 change calls the State Pollution Prevention Office, which has good ties to the media permitting offices. The Office will then call and informally request that this permit be expedited. Usually, the review process can be reduced by one half to one third. A representative from the Illinois office of P2 indicated that while firms appreciated the extra help expediting their P2 permit changes, this was not a direct incentive to institute P2 if a firm was not already planning to use P2 (T.Wallin, IOPP, personal communication).

2.9 Extended Compliance Time

states occasionally have been able to provide extended compliance schedules to firms who want to implement P2. Offering extended compliance schedules may provide a short-term environmental detriment which can be weighed against long term benefits that may accrue from a facility's implementing of P2 rather than pollution control.

Examples of Offering Extended Compliance Time for P2 Projects

Wisconsin

Wisconsin water quality permit applicants can obtain an extended compliance schedule to enable them to implement P2. A regulator cites an example of a situation in which he was able to build an extra year into the compliance schedule so that a firm could use P2 to meet regulatory limits. If the extra time had not been provided, it would have been impossible for that firm to come into compliance using P2 (D.Hantz, WI DNR, personal communication).

Region 9

EPA Region 9's small business incentives policy gives firms 18 months of compliance extension if they are using P2 rather than the usual six for normal measures. We were not able to find out how successful this effort was in promoting P2, but it provides an example of a state that has instituted a P2 incentive.

Texas

Texas' Natural Resource Conservation Commission, in its flexible permit program under NSR is able to offer firms up to five years to come into compliance with BACT prescribed by the flexible permit (see page 12). This program is not designed to especially promote P2, but rather demonstrates an example of a situation where extended review can be offered where it will help a facility reduce emissions over the long term (S.Hildebrand, TNRCC, personal communication).

2.10 Alternative or Reduced Monitoring as Reward for P2

The states and the EPA have been interested in finding incentives that they can offer to firms in exchange for the firms commitment to either go beyond compliance, or to perform some extra P2 measures. One possibility is to offer the firm the opportunity to do less monitoring or record keeping. The rationale for such concession is that if the firm is well below regulatory thresholds, then there is less danger to the public health if they are not monitoring as strictly.

Where P2 efforts are relatively easy to take, as in the stormwater case, the incentive of reduced monitoring is likely to be more successful. Where the P2 effort requires a larger

investment, the incentive of reduce monitoring may not be adequate to offset the costs. In addition, the effectiveness of the incentive is likely to depend on how widely know it is and how well the regulators and regulated community understand it.

Examples of Reduced Monitoring

Wisconsin

In Wisconsin, reduced sampling and reduced planning and reduced fees are offered to firms that can show uncontaminated stormwater runoff (almost entirely obtainable by P2 measures like covering a dumpster or keeping potential contaminants away from stormwater). This has reportedly been very successful as an incentive, although the fees involved are relatively low (\$100 or \$200 per year), the combined reduced sampling and chemical testing combined with the reduced fee resulted in firms being willing to invest in implementing P2 practices. This program has been heavily promoted by the state and industry was involved in developing it (R.Larson, WI DNR, personal communication).

North Carolina

A broader situation of reduced monitoring as a reward for use of P2 occurs when a standard is written such that demonstration of the use of a technology or input or work practice is the required compliance demonstration; thus the facility is not required to keep records on usage and emissions factors or monitor for emissions, but merely must certify application of the given technology. This is shown in the situation in North Carolina where state RACT rules allow use of low-VOC-emission coatings for various industries as an alternative to prescribing a numerical daily emissions limit. The record keeping requirement is thus reduced from a requirement of monitoring coating use daily and calculating emissions based on emissions factors to merely certifying use of one of the compliant coatings. Although the reduction in record keeping is significant, the program was described by one regulator as only marginally effective in promoting P2. In part this is because not many facilities know about it or about how to take advantage of the alternative regulations, in part because the coatings switch is perceived to be fairly difficult, and there are quality concerns in making the conversion. In the case that RTI reviewed, the facility was already committed to using low-VOC paints, and had applied for a permit modification without realizing that they could obtain reduced reporting requirements (P.Lloyd, NCDEM, personal communication).

Indiana

The Indiana non-Control Technology Guideline RACT standard for VOCs has various record-keeping, monitoring and testing requirements for facilities that are meeting RACT by using control technologies, but where they meet RACT by substituting non-VOC materials for high-VOC ones, they only have the recordkeeping requirement. An Indiana regulator who worked on the standard also noted that the state's compliance review burden was significantly reduced

in cases of facilities that had used material substitution for compliance (J.McCabe, IDEM, personal communication).

U.S. EPA

The EPA's Permit Improvement Team⁴ (PIT) has also shown interest in alternative monitoring as a P2 incentive, suggesting that two tracks of compliance monitoring be offered to facilities but this appears not to have been implemented thus far (U.S. EPA, 1995b).

EPA guidance for capture efficiency for the coatings industry incorporates an alternative monitoring component, which would allow states to allow firms to use statistical methods to show compliance rather than more expensive direct monitoring. The firm would, however, have to be operating well below permitted levels to meet the criteria for this method. This could provide a good incentive for facilities that are committed to going beyond compliance, either as part of EPA pilot programs or as part of other commitment to an improved environmental record (U.S. EPA, 1995c).

2.11 Use of Inspectors to Promote P2

Not only can P2 conditions and planning be incorporated into a specific permit, but the permit inspection process may be an effective tool for promoting P2. Permit inspectors may be very well acquainted with the operations of the regulated industries. Thus, some states have attempted to train their inspectors to be able to identify P2 opportunities or to promote P2 in other ways.

Use of inspectors to promote P2 has promise because they are actually inside the facilities and can observe specific opportunities for improvement. An inspector who is observing potential violations and can point out ways to avoid such violations is in a good position to get the attention of a facility's management. Nevertheless, the inspector's job must remain focused on collecting legal evidence regarding regulatory compliance. Use of permit inspectors to promote P2 has the potential of creating confusion about whether the inspector is there for enforcement or for promoting voluntary changes. This confusion may result in the inspector's P2 suggestions being incorrectly perceived as requirements. Further, the types of knowledge required of good inspectors and good P2 technical assistance staff are different. Inspectors must be regulatory experts, while technical assistance staff must have industrial process knowledge (Helbrecht, 1994).

EPA Region 1 summarized its positions on regulatory and nonregulatory approaches to promoting P2 in a 1993 white paper. The Region emphasized the need to clearly distinguish

⁴ The Permit Improvement Team is composed of EPA and state regulators. The Team is charged with identifying improvements to the permit system and mechanisms for implementing the improvements.

between compliance assistance and enforcement activities. The white paper emphasized the potential danger of confusing these two roles when permit inspectors also have a role in compliance assistance, including P2 assistance (USEPA, Region 1, 1993).

Examples of Using Inspectors to Promote P2

U.S. EPA Region 9

EPA Region 9 evaluated the use of inspectors to do waste minimization opportunity assessments at facilities. They concluded that they did not have the resources or technical capabilities for such a program, and that it would also be at odds with their principal mission of compliance (L.Magnuson, U.S. EPA, personal communication).

Indiana

Indiana inspectors distribute P2 information during inspections and have been trained in P2. They can suggest operational improvements but not reengineering. There were concerns that going further would put too much burden on inspectors or create a conflict of interest (T.Neltner, IDEM, personal communication).

2.12 Incorporating P2 into the Underlying Rule

An important way of incorporating P2 into permits is to incorporate P2 into the underlying rule. This can be accomplished either by prescribing the P2 measure directly (as in the case of prescribing certain work standards or maintenance efforts) or by basing a numerical limit on the emissions reductions that can be achieved by P2 measures. Rules may also promote P2 by explicitly allowing for P2 measures to be used for compliance, or by creating similar incentives for use of P2 as for control measures.

Examples of Incorporating P2 into Rules

Indiana

When Indiana was developing its non-CTG RACT rule, they discovered that many facilities to which this rule would apply were planning to use materials substitution to reduce their VOCs. This caused some concern by Region 5 whether these kinds of reductions would be enforceable. The region felt that a RACT requirement of 81% reduction through pollution control was a more enforceable requirement. The state was able to work with EPA to develop a three-tier rule that explicitly allows P2 as a compliance strategy:

- ▶ Tier 1 facilities reduced their VOCs 98% from a calculated baseline through documented reduction in use of VOC containing materials or through add-on controls.
- ▶ Tier 2 facilities are those that could achieve 81% reduction through substitution or control. These facilities were required to not only do the complex baseline calculations, but also to make a demonstration that they could not achieve a 98% reduction.
- ▶ Tier 3 facilities are those that could not achieve 81% reductions. These facilities had to make a demonstration that they could not achieve the reductions, and a case-by-case RACT was set for these facilities.

This rule facilitates use of material substitution (P2) in a context that might have required exclusively pollution control requirements. In addition, all the facilities that achieved 98% reduction did so by material substitution, and thus were exempted from the requirement to make a demonstration that lesser-reducing facilities had to make of inability to reach 98% (J.McCabe, IDEM, personal communication).

Also in Indiana, the state found that it had written a rule in which facilities could comply with coatings limits by using control devices or using high volume low pressure (HVLP) guns and work practices. The rule prescribed that if the P2 measures were used, that the facility had to also include a training component to its use of P2 for compliance. This was seen as a disincentive, so the state revised the rule to require a training component for firms that were using a control device to comply (T.Neltner, IDEM, personal communication).

Indiana's pollution prevention office conducts review of all state environmental rules and suggests changes that can make them more P2 friendly or remove P2 disincentives. This has resulted in the modification of approximately ten rules since the program began.

3 Conclusions

Many states and some federal programs are trying to integrate P2 into their permitting activities. These efforts occur at all stages of the life of the permit, from pre-issuance to permit inspections.

Often, activities to promote P2 through permits involved removing P2 disincentives contained within the existing permit structure. Other efforts concentrated on providing direct incentives for P2 efforts. Still other integration efforts aimed at directly incorporating P2 concepts and conditions into the permit. Many of these P2 integration efforts are still at the pilot stage, or are applied to a small segment of individual industries. Often, too, these efforts are not followed up with systematic evaluation of the effectiveness of the efforts, forcing those who want to extend such efforts to rely on anecdotal evaluations of the effort. Even with anecdotal evaluations, it is difficult to draw broader conclusions about how well any given P2-integration approach will work because the effectiveness of the method will vary according to the context in which it is applied.

Although it is impossible to make broad generalizations based on the results of this report, it is possible to parse out some factors which were present in several of the programs that reported successful integration of P2 into permits:

- ▶ The mechanism of the integration effort is consistent with the state's underlying P2 mandate and philosophy
- ▶ Regulators worked with other stakeholders (e.g., industry, the EPA Region) to solve potentially contentious issues
- ▶ The regulators worked with regulated facilities early in the process

These factors will be important for states to consider as they embark on efforts to promote P2 through the permit process. They will also be important for the EPA to understand as the Agency works with the states to manage the Title V Permit programs and other environmental permit programs.

Appendix A

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