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Electronic Environmental Permitting: Panacea or Pandora's Box?

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ELECTRONIC ENVIRONMENTAL PERMITTING: PANACEA OR PANDORA'S BOX?

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Computers are extremely beneficial to man; without them we could not have walked on the moon. Indubitably they promote efficiency in the governmental sphere. Because the use of computers is so politically and managerially attractive, however, we run the risk that extensive use of this new and expanding technology will blind us to the potential hazards of accidental or intentional misuse.[1]

I. INTRODUCTION

As we move into the 21st century, our increasingly interdependent society is utilizing more sophisticated information and communication technologies. Many of these technologies are based on ever-advancing computers and computer applications. The dependence bred from this increased utilization is not limited to the private sector. Government agencies at the federal, state, and local levels continue to invest huge sums of tax dollars in computer technology upgrades and to go on line.[2]

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[1] W. CRONKITE, *forward* to D. BURNHAM, THE RISE OF THE COMPUTER STATE vii, n.9, 6–7 (1983) *cited in* James R. Dietz, *Federal Government Computer Data Sharing and the Threat to Privacy*, 61 U. DET. J. URB. L. 605, 607 (1984).

[2] *See* Alana Northrop et al., *Payoffs from Computerization: Lessons over Time*, 50 PUB. ADMIN. REV. 505, 511–13 (1990).

Governmental agencies must process vast amounts of data—the ubiquitous "paperwork," on a daily basis. The volume of this paperwork rises exponentially as the complexity of governmental functions increases. Nowhere has growth of these functions exploded so much as in environmental agencies.

A. *Focus*

Environmental agencies increasingly look to computer technology to assist in the management and processing of regulatory data. This Article will focus on the use of advanced computer technology in the context of the state environmental agency. Specifically, this Article will consider the example of electronic permit application and computer generation of National Pollutant Discharge Elimination System (NPDES)[3] permits issued under the Clean Water Act (CWA).[4] State NPDES permit programs lend themselves to an analysis of the effects of computerization because these programs are part of a mature, well-developed statutory and regulatory environmental scheme.[5]

Current NPDES programs are plagued in many states with significant backlogs.[6] In some states, these backlogs have caused permits with less stringent limits to be extended because granting extensions is more administratively expedient than acting on renewal applications.[7] Consequently, existing permittees continue to pollute under older, less stringent standards because bureaucracy in the regulatory agency prevents action on new permits. As a result, newer, more protective environmental standards may go unfulfilled. Moreover, commerce is hurt when new businesses cannot obtain permits promptly. In light of these backlog problems, computerization of permit application and issuance appears to many stakeholders in the permitting process as a possible solution.

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[3] NPDES, 33 U.S.C. § 1342 (1994).

[4] CWA, 33 U.S.C. §§ 1251–1376 (1994).

[5] *Id.* §§ 1251, 1369–71.

[6] *Budget: Funding Shortfalls Affect Enforcement, EPA Ability to Protect Environment, Report Says*, 24 Env't Rep. (BNA) 189 (May 28, 1993). According to the fiscal 1993 report by the Environmental Budget Priorities Project, Environmental Protection Agency (EPA), programs that required more money and attention included "issuance of a backlog of 11,000 permits for industrial discharges into water." *Id.*

[7] EPA Administered Permit Programs, 40 C.F.R. § 122.6(d) (1995).

B. *Scope of Article*

The computer provides state environmental agencies with a powerful tool to facilitate efficient service to the public and to streamline the processing of information. At the same time, these opportunities may create risks that include the possible loss of human involvement in administrative decisionmaking and a possible reduction of adequate security in dealing with confidential data. Reliance on computer technology by state environmental agencies can run the gamut from completely integrated computer dependency to partial and selective utilization of technology for minor aspects that fit a particular program.

This Article does not deal with minor uses of electronic technology to reduce repetitious paperwork burdens that agencies commonly encounter. Rather, this Article focuses on a comprehensive computerized permitting system. The authors argue that it is manifestly unwise for state agencies to rely wholesale upon emerging technologies in a comprehensive regulatory scheme without adequate and thoughtful consideration of the potential dangers of such reliance. This Article intends not to attack electronic environmental permitting as a concept, but to strike a cautionary note in the hope of encouraging state agencies to assess all of the possible consequences.

II. Current Environmental Permitting Process

A. *Concept of Permitting in the Environmental Context: Allowable Levels of Pollution*

Operating permits,[8] whether issued by federal or state agencies, have been the mainstay of regulatory efforts to control pollution since Congress began enacting modern environmental legislation in the early 1970s.[9] Operating permits, when issued to particular industries

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[8] *Id.* Section 122.2 states:

> *Permit* means an authorization, license, or equivalent control document issued by EPA or an "approved State" to implement the requirements of this part and parts 123 and 124. "Permit" includes an NPDES "general permit" (§ 122.28). Permit does not include any permit which has not yet been the subject of a final agency action, such as a "draft permit" or a "proposed permit."

Id. § 122.2.

[9] Thomas J. Schoenbaum & Ronald A. Rosenburg, Environmental Policy Law 940 (1991).

or sources,[10] define the level of emission or discharge of a specific pollutant that legally is allowed and establish the sources' obligations with respect to each regulated pollutant.[11]

Most federal environmental regulatory statutes dealing with control of pollution employ the operating permit to some extent.[12] The CWA,[13] for instance, establishes discharges that are authorized by operating permits as exceptions to the general prohibition against "the discharge of any pollutant by any person [into the nation's waters]."[14] Another example is the Solid Waste Disposal Act (SWDA),[15] which requires permits for treatment, storage, and disposal facilities.[16] The manifest system under RCRA tracks the movement of wastes from "cradle to grave" and operates in many respects as a permit system.[17] Permits also are employed to control air pollution. Prior to the Clean Air Act Amendments of 1990 (CAAA),[18] three-fourths of the states required operating permits for most major and minor sources.[19] Title V of the Clean Air Act (CAA)[20] established a national air operating program to be implemented by qualifying states.

Permitting programs represent the epitome of "command and control"[21] regulatory strategies. Permits allow regulators to achieve three goals: (1) to establish inventories of all permittees;[22] (2) to enforce statutory and regulatory requirements by providing a mechanism for

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[10] Permits are issued to "point sources," defined at CWA, 33 U.S.C. § 1362(14) as "any discernable, confined and discrete conveyance . . . from which pollutants are or may be discharged." *Id.*

[11] *See* LEONARD A. MILLER ET AL., NPDES PERMIT HANDBOOK 3 (2D. ED. 1992).

[12] *See, e.g.*, CWA, 33 U.S.C. §§ 1251–1376; Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901–87 (1994).

[13] CWA, 33 U.S.C. §§ 1251–1376.

[14] *Id.* Water pollution in the United States is regulated not only by the CWA, but also by the Marine Protection, Research and Sanctuaries Act of 1972, 33 U.S.C. §§ 1401–21 (1994), the Safe Drinking Water Act of 1977, 42 U.S.C. §§ 300f–300j–11 (1994), and the Oil Pollution Act of 1990, 33 U.S.C. §§ 2701–19 (1994). *See generally* Leonard P. Pasculli, *NPDES Permit Exceedances: If You're 'Upset', That's Good*, 1 ENVTL. CORP. COUNS. REP. 7 (Dec. 1994).

[15] RCRA, 42 U.S.C. §§ 6901–87.

[16] *Id.* § 6925.

[17] *See id.* § 6923.

[18] Pub. L. No. 101–549, 104 Stat. 2399 (Nov. 15, 1990).

[19] Air Pollution Control, BNA Policy and Practice Series 131:51(1994).

[20] RCRA, 42 U.S.C. §§ 7661–61f.

[21] Under the "command and control" approach, government authorities issue specific control commands to regulated firms and then monitor the firms to ensure that the commands are followed. R.V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION LAW, SCIENCE, AND POLICY 796 (1992).

[22] *See* CLEAN AIR ACT AMENDMENTS OF 1989: REPORT ON S. 1630, S. Rep. No. 228, 101st Cong., 1st Sess. 346 (1989) [hereinafter Senate Report].

application of those requirements to a specific source;[23] and (3) to implement new control requirements in an expedited fashion for those sources affected by specific requirements.[24]

The major goal of all environmental permitting programs is to clarify and make more readily enforceable a source's statutory and regulatory obligations.[25] Without an individualized permit, a source would have to analyze the myriad statutory and regulatory provisions and identify those particular mandates that apply to the source's own emissions. Enforcement actions by regulators would be constantly under attack because of the ambiguity involved in determining which provisions apply to a particular source and the degree of enforceability of those provisions. Moreover, regulatory programs that are required to monitor total levels of pollution would be unable to track levels without the individual operating permit.[26] Permits provide a single document for use by the permittee, the regulator, and the public in determining the extent of a source's compliance obligations.

A permit program also simplifies and expedites procedures to modify obligations as those obligations are revised at the state and federal levels.[27] Permit writers usually include "reopener" clauses that allow the agency to reopen a permit and add revised or new requirements.[28] Finally, a permit program can assist states in collecting fees to develop and administer its regulatory programs.[29]

B. *NPDES—A Permitting System Paradigm*

Environmental regulatory law began in earnest in the United States with the passage of the CWA in 1972.[30] The CWA has become the model for subsequent enactments and the prototype for permitting programs developed under other environmental statutes.[31] One of the stated goals of the CWA was to ensure that "the discharge of pollut-

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[23] *Id.*

[24] *Id.*

[25] *Id.* at 346–48.

[26] Examples of such regulatory programs are: the CAAA, Pub. L. 101–549, 104 Stat. 2399 (Nov. 15, 1990); the CWA, 33 U.S.C. §§ 1251–1376; and RCRA, 42 U.S.C. §§ 6901–87.

[27] *See* EPA Administered Permit Programs, 40 C.F.R. §§ 122.44(c).

[28] *Id.*

[29] Joyce Martin et al., *Funding State Environmental Programs: Indiana's Solution*, 2 ENVTL. L. 434, 443 (1995). Currently, however, beyond the Title V program, a system in which fees are charged to permittees for permits is not a widespread phenomena. *Id.* at 437, 457.

[30] *See* PERCIVAL, *supra* note 21, at 866.

[31] The Senate Report proposes the creation of an air permitting program similar to that developed under the CWA.

ants into navigable waters be eliminated by 1985."[32] Section 402 of the CWA created the NPDES to regulate discharge of pollutants into the waters of the United States.[33]

At present, specially trained permit drafters review permit applications and write NPDES permits, taking their direction from the CWA and its implementing regulations.[34] NPDES permits are issued by the Environmental Protection Agency (EPA) or, alternatively, by a state agency if the EPA has delegated permit-issuing authority to the state.[35] The EPA issues NPDES permits for sources in twelve states that have not obtained such authority from the EPA.[36] Regardless of whether the EPA or a state is the permit-issuing entity, the process essentially entails the same six steps:

(1) *Information collection*—The applicant files a series of standardized forms to the permitting authority. The application is reviewed for accuracy and completeness.

(2) *Development of the draft permit*—Once the permit drafter determines that the permit is complete and accurate, the permit writer prepares a draft permit that includes the following items:

(a) effluent limitations;
(b) monitoring requirements;
(c) standard conditions; and
(d) special conditions.[37]

The draft permit must be accompanied by a "fact sheet" that must "set forth the principal facts and the significant factual, legal, methodological and policy questions considered in preparing the draft permit."[38]

(3) *Public participation*—Public notice of the draft permit must be provided and at least thirty days allowed for public comment.[39] If the public comment period yields "significant interest," a public hearing of the draft permit may be held.[40] In states with approved NPDES programs, the EPA has ninety days to object to the proposed state permit.[41]

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[32] CWA, 33 U.S.C. § 1251(a)(1).

[33] *Id.* § 1342.

[34] *See generally* EPA Administered Permit Programs, 40 C.F.R. §§ 122.1–.64. *See also infra* note 56.

[35] EPA Administered Permit Programs, 40 C.F.R. § 123.1.

[36] MILLER ET AL., *supra* note 11, at 17–18.

[37] EPA Administered Permit Programs, 40 C.F.R. § 124.6(d).

[38] *Id.* § 124.8(a).

[39] *Id.* § 124.10(b)(2).

[40] *Id.* § 124.12(a).

[41] CWA, 33 U.S.C. § 1342(d)(2); EPA Administered Permit Programs, 40 C.F.R. § 123.44(a)(1).

(4) *Issuance of the final permit*—After the close of the public comment period or the public hearing, the final permit may be issued. The permit becomes effective thirty days after service of notice of the decision.[42]
(5) *Challenge to a final permit*—After issuance, any interested person, including the permittee may challenge a permit.[43] The petitioner must request an evidentiary hearing within thirty days of the final permit decision.[44] Normal administrative procedures govern the appeal process,[45] unless state law establishes a different effective date.
(6) *Permit modification, revocation, and transfer*—Minor modifications do not require public notice but major modifications do.[46] NPDES permits can be terminated for a number of reasons.[47] Regulations also provide for transfer of an existing NPDES permit upon change of ownership of a facility.[48]

The NPDES permit is the regulatory vehicle that authorizes the source-specific discharge of pollutants under the CWA.[49] Once a NPDES permit is issued, the permit and its conditions define the legal obligations of the permittee with respect to the permitted discharge.[50] The permit, then, becomes the primary mechanism for EPA or state enforcement actions regarding that discharge.[51]

III. Electronic Environmental Permitting Process in the Future

A. *Background*

In order to draft NPDES permits, state environmental agencies traditionally employ several permit writers to craft individually tailored permits on computer terminals tied to a central mainframe computer.[52] The permit writer is usually a qualified and experienced

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[42] EPA Administered Permit Programs, 40 C.F.R. §§ 124.15(a)–(b).
[43] *Id.* § 124.74.
[44] *Id.*
[45] Administrative Procedures Act, 5 U.S.C. §§ 552–59 (1994).
[46] EPA Environmental Permit Programs, 40 C.F.R. § 122.63.
[47] *Id.* § 124.5(a).
[48] *Id.* § 122.61.
[49] CWA, 33 U.S.C. § 1342.
[50] EPA Administered Permit Programs, 40 C.F.R. §§ 122.41–.50.
[51] *See* William H. Rodgers, Jr., Environmental Law 664 n.18 (1988 & Supp. 1995) (quoting J.E. Bovine and T.O. McGarity, Cases on the Law of Environmental Protection 514 (1984)).
[52] *See* Bruce Rocheleau, *Information Management in the Public Sector: Taming the Com-*

environmental scientist, fluent not only in the technical aspects of the CWA and its point source requirements, but also in the social, political, and economic realities of the regulated community. Of course, this method of permit writing is a necessarily slow process that creates backlogs as more applicants seek necessary permits from a state agency that employs a finite number of permit writers.

Given the level of discontent, both externally and internally, with the current NPDES permitting process,[53] state environmental agencies are under tremendous pressure to make the process simpler and more efficient. As a result of this pressure, agencies are looking to computer technology as a panacea for dealing with their backlogged permit problem. As the number and complexity of regulations increases[54] and the number of industries affected by those regulations grows, the backlog in permit writing takes personnel out of the field and keeps them inside drafting permits.[55] This shift from inspection and monitoring to permit drafting restricts the agency's access to important empirical data about regulated entities, insulates agency employees from practical conditions, and increases the level of frustration within the state environmental agency, the regulated community, and the public.

B. *Evolving Computer Technology*

Modern computer technology offers regulatory agencies a convenient and alluring way out of the dual dilemma of backlogged permits and constantly increasing applications.[56] A central computer can be outfitted with a huge data bank containing several model permit-writ-

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puter for Public Managers, 52 PUB. ADMIN. REV. 398, 398 (July/Aug. 1992). "During the mainframe era, computer applications were developed by submitting requests to data processing departments and then waiting a long time period for results. . . . Consequently, information systems provided little assistance in the decision making process." *Id.*

[53] RODGERS, *supra* note 51, at 364.

[54] For example, the EPA, like the other federal agencies, publishes its regulatory agenda twice a year. This agenda of new regulations runs to hundreds of pages of brief descriptions of future rules. *See, e.g.*, Regulatory Agenda, 58 Fed. Reg. 56,998 (Oct. 25, 1993).

[55] *See States Maintain Environmental Enforcement Efforts Despite Budget Cuts*, 21 Env't Rep. (BNA) 1,754 (Feb. 1, 1991). "The [D]epartment [of Environmental Protection] is plagued by a long backlog of permit applications, which leads to less time and fewer resources being devoted to environmental monitoring and inspections, according to state Sen. Michael Meotti" of Connecticut. *Id.*

[56] Paul Schwartz, *Data Processing and Government Administration: The Failure of the American Legal Response to the Computer*, 43 HASTINGS L.J. 1321, 1325 (1992). "The computer is an appealing device for bureaucracies that are perpetually seeking to improve their means of processing knowledge."

ing programs designed to cover various types of permit applications and potential discharges. Hypothetically, such an electronic permit-writing apparatus would reduce significantly the need for human permit writers to labor over individual permit applications. With the advent of this technology, old NPDES permit writers appear analogous to medieval monks who scripted individual biblical texts before the advent of the Gutenberg printing press.

A computerized system could not only meet, but also surpass, many of the efficiency goals of state environmental agencies.[57] Moreover, beyond slicing through the backlog of permit applications and greatly reducing the turn-around time between permit application and permit issuance, advanced computer technology also could reduce the costs of issuing permits[58] because fewer permit writers would be needed.

However, in such a scenario, reliance on computers largely eliminates the human element from the process. Consequently, the subjectivity and individuality[59] that the human permit writer provides would be absent from the permit writing process. The permit writer's mind along with all of the internal conscious and subconscious considerations that the permit writer takes into account when drafting a permit, would somehow have to be quantified and reduced to a computer program. Moreover, human permit writers' unique ability to set effluent limits based upon their own best professional judgment also would be absent.[60]

Several questions logically arise. First, can the permit-writing process be broken down into a bit-stream to be fed into a computer? Will the electronic permit writer process the information in such a way as to emulate accurately the mental process of a human permit writer? Can an electronic permit writer ever duplicate what a human permit writer would do? Where does the concept of *original thought* reside within a computer program? How is it quantified? Of course, these matters are currently just speculation. Until a state environmental agency actually goes *on line* with such an electronic permit-writing

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[57] Henry H. Perritt, Jr., *The Electronic Agency and the Traditional Paradigms of Administrative Law*, 44 ADMIN. L. REV. 79, 96 (1992). "The advantages of expanding electronic methods for internal agency management are greatly reduced transaction costs for making managerial decisions, advancing the efficiency goal. Electronic delivery of services . . . also advance[s] the efficiency goal." *Id.*

[58] *See id.*

[59] *See infra* section IV.B and accompanying text.

[60] *See infra* section IV.B.2 and accompanying text.

mechanism, all of this is mere shadow boxing. Currently, however, at least one state agency is developing plans along these lines.

C. *Case Study: Electronic NPDES Permitting in Michigan*

The Michigan Department of Natural Resources (Michigan DNR), Surface Water Quality Division (SWQD), is developing a new electronic NPDES permit-writing system to be operational in 1995.[61] SWQD currently employs "dumb terminals"[62] tied to a central mainframe computer for permit drafting and public noticing.[63] The permit writers process each permit application individually. As with most states, Michigan faces a backlog of NPDES permit applications.[64]

SWQD began planning for a new electronically integrated permitting system because of inadequate interface between the mainframe computer and the other computer systems that handle logging, tracking, and communication, inefficiency of the current system, decentralization of permitting authority, and withdrawal of support for the current system by IBM.[65] In this new environment, local and wide area networks will link individual personal computers to a central information bank, or file server, that will be available for common permitting usage. A centralized computer program will execute the permit writing for generalized boilerplate permit conditions and then download the boilerplate language to the information bank. Human permit writers then can access these permits and issue them to the applicants, making any necessary modifications. The new system also will incorporate logging and tracking applications, public noticing, and internal as well as external communications. Although the human element will not be erased in the Michigan model, it will be reduced.[66]

Moreover, Michigan anticipates that participation of human permit writers in this process will decline as the future brings newer, more independently thinking, or artificially intelligent, technology. Michigan's SWQD also expects that eventually industry applicants will submit NPDES permit applications electronically.[67] One problem aris-

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[61] Telephone interviews with Pete Ostlund, Unit Chief, Industrial Permits Unit, Michigan DNR, SWQD (Aug. 15, 1994, Mar. 23, 1995, and via telefax Apr. 3, 1995) [hereinafter Ostlund Interview].

[62] *Id.*

[63] *Id.*

[64] *Id.*

[65] *Id.*

[66] Ostlund Interview, *supra* note 61.

[67] *Id.*; *see also New York Plants to Test Electronic Data Submission*, 25 Env't Rep. (BNA)

ing from such a scenario, according to SWQD, is separating the permit application apparatus from the permit writing apparatus.[68] Only an impenetrable electronic barrier between the two systems will ensure that an industry applicant cannot jump from submitting applications into the permit-writing programs and write its own NPDES permit. Michigan's SWQD sees this threat of undermined system integrity and state control as the chief weakness of electronic application and permitting identified thus far.[69]

Another feature of this system is the creation of an electronic bulletin board through which industry could receive status reports on permit applications.[70] To receive a status report on its permit under the current "human issued" permit system, the permittee sends a letter of inquiry to Michigan DNR. With an electronic permitting system, industry would pay for the status report service from Michigan DNR by using a "1–900" telephone number. Additionally, the state would mail fee invoices electronically.[71] A system that allows electronic application submission, permit writing, notice, and issuance seems to provide a comprehensive answer to a multitude of problems. However, this proposed problem-solver, raises tangential problems as well. Access to and accuracy of information,[72] public participation in the decisionmaking process,[73] quantification of political considerations

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No. 25, at 324 (June 17, 1994). Six industrial plants and one municipal installation plant plan to submit water pollution compliance data to New York's Department of Environmental Conservation (DEC) electronically. DEC Commissioner, Langdon Marsh, said of the New York proposed scheme, "this is another step in our regulatory reform program to eliminate unnecessary reporting requirements . . . and make permitting and compliance procedures swifter." *Id.*

[68] *Id.*

[69] *Id.*

[70] *Id.*

[71] Ostlund Interview, *supra* note 61.

[72] Sharon L. Caudle, *Managing Information Resources in State Government*, 50 PUB. ADMIN. L. REV. 515, 523 (1990). According to Caudle, "[w]hat constitutes appropriate electronic information access and integrity is just one area managers will confront as external and internal users demand accurate information that can be easily stored, maintained, and retrieved in the right format when requested." *Id.*

[73] Sandra Davidson Scott & Elliot Jaspin, *Should Government Copyright Its Computer Software?*, 25 L./TECH. 1, 23 (1992). In order for government to meet its public notice and participation requirements electronically, the authors define a couple of hoops which must be surmounted:

> [f]irst, government must be required to provide public terminals as well as remote, on-line access for any information kept in electronic form. In this way, people with little or no computer equipment will still be able to inspect public records. Second, government must be required to export or copy information from its software into the standard electronic format discussed above for distribution to the public.

in agency decisionmaking,[74] and accessibility for increased computer criminal activity[75] are but a few concerns that surface when contemplating such a comprehensive electronic system.

IV. Concerns Regarding Electronic Permitting

A. *Computer Crime*

Perhaps the single greatest concern facing an operational electronic permitting system is the potential for computer crime. Tampering with permits by outsiders would threaten the integrity of the permitting process. Potential abusers include not only idle hackers[76] looking for fun, but also members of the regulated community attempting to obtain looser discharge limits in their own permits and stricter discharge limits in their competitors' permits. Likewise, members of the environmental community could alter permits to tighten discharge limits for all industries. Given these potential security threats, there are grave doubts about the ability to preserve the system's integrity.[77] Moreover as agencies increasingly rely upon computer technology, the danger for harm increases as well.[78]

Id. at 23–24 (citation omitted) (when offering on-line access to an electronic file or data base, a public agency shall provide without charge on-line access to the electronic file or data base through one or more public terminals).

[74] Northrop, *supra* note 2, at 510. "The usefulness of computerized data in planning decisions is severely limited by the quality of database management applications and especially by the political factors that necessarily must be taken into account in decision making." *Id.*

[75] David I. Bainbridge, *Hacking—The Unauthorized Access of Computer Systems; The Legal Implications*, 52 Mod. L. Rev. 236, 237 (1989).

> In the days before computers, sensitive information was kept locked away, in filing cabinets in locked rooms on the premises of the organization holding the data. This meant that the information was fairly safe from being tampered with or copied. . . . By contrast, information stored on a computer which is linked to the telecommunications network is much more vulnerable. It is analogous to paper files kept in locked cabinets but left in a public place. It is just a matter of finding the right key to fit the cabinet. Not only can a total stranger try the lock but, usually, he can spend as long as he likes trying different keys with impunity until he finds one that turns the lock.

Id.

[76] The term "hacker" refers to someone who uses his or her computer knowledge and a computer to break into another computer system. David J. Loundy, *E-Law: Legal Issues Affecting Computer Information Systems and Systems Operator Liability*, 3 Alb. L.J. Sci. & Tech. 79, 83 n.7 (1993).

[77] As Anne Branscomb, past Chair of the Communications Law Division of the American Bar Association's Science and Technology Section noted, "[s]ecurity specialists are not confident that technological barriers can be erected to guarantee protection." Anne W. Branscomb, *Rogue Computer Programs and Computer Rogues: Tailoring the Punishment to Fit the Crime*, 16 Rutgers Computer & Tech. L.J. 1, 3 (1990).

[78] *Id.* at 1–2. "As computer networks become more ubiquitous, desktop computers more

From the standpoint of the regulated community, the motives for tampering begin with the economic value of the permit itself.[79] As regulators tighten wastewater discharge limits and designate more substances as regulated pollutants, regulated industries must purchase and install new treatment technologies—investments that run into millions of dollars. Regulatory compliance diverts money from plant expansion, market development, job creation, and mechanical upgrades. Ultimately, rising compliance costs erode profit margins. Thus, a regulated industry has a clear, short-term economic interest in remaining outside of new categories, continuing under old discharge limits, or obtaining newly reduced limits. These incentives may lead to corruption of an open electronic environment.

Under the old system, the human permit writer could strike a compromise with the agency's human policymakers. Under a new, electronically integrated computer system, negotiations are not possible. The only way to affect the output of the computer is to affect the computer program. Unfortunately, a hired hacker could affect the computer program by changing the limits, authorizing the document,[80] and then electronically issuing the permit. The hacker's motive may be rooted in the *hired gun* mentality—little chance of detection and high pay.[81] Detection of such tampering, if detection ever occurs, may be long delayed.

> Computer frauds lack visibility: changes in a computer program can be removed after the offense has taken place, or the change may affect only a minuscule portion of the processed data, or the fraudulent manipulation may be programmed to take place at a predetermined future time. Indeed, in the vast majority of cases, detection has been a matter of sheer accident, rather than as a result of an ongoing security or auditing effort.[82]

In an automated decisionmaking process, such as a comprehensive electronic permit writing system, speculation about criminal penetra-

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commonplace, and society becomes more dependant upon them, the potential for harm grows accordingly." *Id.*

[79] *See* Stanley L. Sokolik, *Computer Crime—The Need for Deterrent Legislation*, 2 COMPUTER/L.J. 353, 358 (1980). "[T]he economic value of the information processed, . . . increase[s] the opportunity and likelihood of worthwhile payoffs from computer-related crimes. Furthermore, the vulnerability of most computer systems makes the payoffs appear possible without much risk of detection and, oftentimes, without any evidence that a crime has occurred." *Id.*

[80] Perritt, *supra* note 57, at 103. "In networked computer systems, the approval token could be generated automatically when the authorized person reads the proposed submission and signifies approval by checking a box or making a menu selection on his or her screen." *Id.*

[81] *See* Bainbridge, *supra* note 75, at 237.

[82] Sokolik, *supra* note 79, at 359.

tion is truly frightening. As far back as 1976, the Comptroller General projected that 1.7 billion payments and other actions by the federal government were "processed by computers without anyone reviewing or evaluating their correctness."[83] Included were unreviewed authorizations for payments, excluding payroll, for $26 billion.[84] Given the extent of government reliance upon such automated decisionmaking since then, and the continued movement in that direction for the future, potential opportunities for computer criminal activity are expanding all the time.[85]

The crime problem is compounded by the need for such a "cradle-to-grave" electronic permitting system to be linked to a network or to the Internet.[86] The Internet is the information superhighway to which computers around the globe have access. The Software Publishers Association estimates that $2 billion was lost last year to piracy on the Internet.[87] Tracking, let alone apprehending, the criminals is almost impossible on this world-wide network.[88]

Consequently, hackers could slip into the electronic permit-writing apparatus undetected, change whatever their industrial employers wanted changed, signal the official approval or review token, and flag the permit for immediate issue the next day. Hackers hired by environmentalists also could do extensive damage by altering permits that appear too lax, or even by programming new strains of computer viruses.[89] These viruses can destroy or rearrange data indiscriminately or on command. In fact, use of a "time-bomb" virus,[90] encoded

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[83] *Id.* at 362.

[84] *Id.*

[85] *See, e.g.*, Brian McConnell, *Global Warning*, NEW L.J., Mar. 2, 1990, at 287. "Computers have come to be regarded as essential to the smooth conduct of government in all departments. . . . They are all more or less dependent on computers. . . . Anyone who doubts the potential field of operation should realize that hacking, like computer programming, is already an industry." *Id.*

[86] The "Internet" is the electronic network of networks which links computers over phone and satellite lines around the world. The current estimates are that about 40 million computer networks are so linked. *Crimes of the 'Net'*, NEWSWEEK, Nov. 14, 1994, at 46.

[87] *Id.* at 47.

[88] *Id.* "[T]racking the cybercrooks won't be easy. The Internet is a chaotic place. Hackers go from computer to computer, vaulting borders and leaving few traces. Before entering a computer at Florida State University, they might pass though another computer in Finland, say, that strips any names or addresses from their communications." *Id.*

[89] A computer "virus" is a program that copies itself into other programs in other computers. McConnell, *supra* note 85, at 287.

[90] *Id.*

on a diskette containing a permit application submission, could breach the integrity of the permit-writing process even if the permitting system were not linked to the Internet.

The public arena of environmental law and regulation is contentious, fraught with politics, economics, and heated negotiations. Some players may pay billions of dollars while others pay with their lives or health. It is critical that criminal elements not gain inroads into the development and manipulation of sensitive and valuable environmental data. The subject matter encompasses values which are too important to our continued existence as a civilization.

B. *Subjective Decisionmaking*

In addition to the threat of unauthorized tampering with an electronic permitting process, taking trained environmental professionals out of the system may create other problems. Cutting off input from agency experts precludes reference to subjective values and professional judgments.

1. Narrative Criteria

Most NPDES permits contain certain standard non-numerical effluent limitations that are "measured" by visual observation.[91] The following limitations are typical: "the discharge shall not contain oil or other substances in amounts sufficient to create a visible film or sheen on the receiving waters"; "the discharge shall not cause excessive foam in the receiving waters"; or "the discharge shall be essentially free of floating and settleable solids."[92] The imposition of these limitations is designed to prevent nuisance conditions in the receiving stream. All permits would continue to require physical inspection despite advances in self-monitoring technologies. No degree of self-monitoring, regardless of how sophisticated the technology, can succeed without supplemental human inspection for possible tampering or the calibrating of the equipment. However, comprehensive computer permitting would reduce the use of narrative conditions because of the inherent subjectivity of narrative conditions.

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[91] MILLER ET AL., *supra* note 11, at 51.

[92] *Id.*

2. "Best Professional Judgment" (BPJ) Permits

Environmental permit writing, as currently performed, is more art than science.[93] As one expert suggests, "[p]ermit writing is not a mechanical task, and good judgment goes into the application of general rules to particular circumstances."[94]

"The first round of NPDES permits issued between 1972 and 1976 emphasized control of 'traditional pollutants'—such as biological oxygen demand (BOD), total suspended solids (TSS), pH, oil and grease, and some metals—through imposition of effluent limitations based on BPJ.[95] These individually tailored limitations were used because the EPA had not yet developed nationally applicable standards.[96] BPJ is essentially the permit writer's opinion, drawn from technically based NPDES permit conditions and based on all available and relevant data. Currently, permit writers examine and evaluate that data through a multi-disciplinary approach.[97] BPJ standards continue to exist in permits for which national standards have not been developed.[98]

> There are several types of circumstances under which BPJ permit limitations may be issued: (1) when national effluent limitations guidelines have not yet been issued for the appropriate industrial category, or do not cover the particular process involved, or have been withdrawn or remanded; (2) when some discharges at the facility are not covered by an otherwise applicable guideline; or (3) when a toxic pollutant not limited by an applicable guideline is discharged.[99]

In making the case-by-case determinations of the appropriate limitations, the permit writer first must determine the appropriate Best Control Technology (BCT)[100] or Best Available Technology (BAT)[101] requirements for the industry as a whole, and then consider any site-specific factors that make the particular discharger different from the industry in general. In the fact sheet accompanying a proposed

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[93] *See, e.g.*, U.S. EPA, OFFICE OF WATER, PERMIT WRITER'S GUIDE TO WATER QUALITY-BASED PERMITTING FOR TOXIC POLLUTANTS, § 1, 1–2 (1987) (stating "the permit writer should consider data from all available sources. . . . The important point in this context is that a combination of factors must be considered."). *Id.*

[94] LAW OF ENVIRONMENTAL PROTECTION 3–49 (Sheldon M. Novick et al. eds. 1995).

[95] SCHOENBAUM & ROSENBURG, *supra* note 9, at 940.

[96] *Id.*

[97] *See* J. GORDON ARBUCKLE ET AL., ENVIRONMENTAL LAW HANDBOOK 179 (1993).

[98] *Id.*

[99] MILLER ET AL., *supra* note 11, at 66.

[100] CWA, 33 U.S.C. § 1311.(301)(b)(1)(A).

[101] *Id.* § 1311.(301)(b)(2)(A).

permit, the permit writer must set forth an analysis of the application of the statutory factors to be considered in establishing BCT and BAT limitations.[102]

In making BPJ decisions, the permitting agency used the following factors: age of equipment and facilities; process employed; engineering aspects of the application of various types of control techniques; process changes; cost of achieving effluent reduction; non-water quality environmental impacts; and other factors the Administration deems appropriate[103] Although a computer program perhaps could include the first six factors, the subjectivity and discretion inherent in the last factor prevent its inclusion in a computerized permitting system.

BPJ is used as a gap filler to set effluent limits. Defensibility of BPJ decisions depends on the reasonableness of the decisions and the documentation accompanying the decisions.[104] Reasonableness of a permit writer's opinion is difficult to quantify in a computer program. Essentially, the question is whether an objective computer program can emulate a subjective permit writer when determining BPJ limits. Given current technology, the answer is probably no.

C. *Negotiation and Bargaining Over NPDES Permit Obligations*

Permits issued under section 2 of the CWA contain pollutant-specific effluent limits as well as many boilerplate conditions that are federally required to be included in all NPDES permits.[105] These boilerplate provisions include monitoring and reporting requirements, notification requirements, and recordkeeping requirements.[106]

On the other hand, there is much in the NPDES process that envisions negotiation rather than regulatory compulsion. "The ultimate standards of compliance are decidedly aspirational in tone, strongly suggesting definition through bargaining, exchange, and compromise."[107] Reporting, monitoring, and other permit duties imply that contact between the polluter and the agency is frequent. Although the relationship is constituted by sporadic exchanges of information, this interaction leads to incremental decisions that define the NPDES permit.[108]

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[102] MILLER ET AL., *supra* note 11, at 66.
[103] *Id.*
[104] *Id.*
[105] CWA, 33 U.S.C. § 1314.
[106] *Id.* § 1314(i).
[107] RODGERS, *supra* note 51 at 364.
[108] *Id.*

A program relying on negotiation and compromise would be difficult to implement if permits were received, written, publicly noticed, and issued via computer because computers are incapable of the nuances involved in negotiation. The regulated community may grow to dislike the inflexibility of computer-generated permits, even if permits are issued more quickly than those drafted by humans, because the rigidity of computerized decisionmaking may result in imposition of stricter pollution limits.

D. *Public Participation Process*

Public participation in the permit issuance process may be limited by use of electronic permitting. Currently, agencies notify the public through written communication when an application has been received as well as when a draft permit has been prepared by the agency and is available for comment. If all permit transactions occur electronically, public notification logically would occur via electronic means as well. Electronic public notification could disenfranchise the computer illiterate. Even if written copies of public notices also were distributed, the agency would have to ensure that all copies were equivalent and afforded all factions of the public the same opportunity to participate. Public participation is required by the CWA,[109] and electronic permitting could risk eliminating or diminishing this essential element to the permitting process.

V. Conclusion

The rise of computer solutions to all manner of modern problems suggests that electronic permit application and processing are on the horizon at some point on the spectrum of technology for environmental regulatory agencies. The existing environmental permitting process, however, has evolved through statutory amendment and case law. Consequently, total automation cannot be implemented at the expense of mandatory permit process elements such as public participation and regulator control of permit limits.

Environmental agencies, charged by law with guarding our nation's environmental integrity, face a sobering decision in the context of electronic permitting: At what point can the regulator, in good faith, hand human thought and intuition over to automated decisionmaking?

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[109] *See supra* notes 32–34.

Where this line is drawn will be dispositive of how seriously these agencies take their responsibilities. To date, that line is merely a scratch in the sand.

Fortunately, most states and the EPA are only in the earliest stages of developing reliable electronic permit processing apparatus. Safeguards to the integrity of these systems must be built in before a full computerized process is on line. Michigan DNR's electronic NPDES permitting experiment undoubtedly will provide valuable data to other states and the EPA before those agencies venture into this brave new world of electronic permitting.