ILLINOIS POLLUTION CONTROL BOARD
August 17, 1990

IN THE MATTER OF:	)	
	)	
DEVELOPMENT, OPERATING AND	)	R88-7
REPORTING REQUIREMENTS FOR	)	(Rulemaking)
NON-HAZARDOUS WASTE LANDFILLS	)	

ADOPTED RULE. FINAL ACTION.

OPINION OF THE BOARD (by J. Anderson):

SUMMARY OF TODAY'S ACTIONS*

On August 2, 1990, the Board received a statement of no objection from the legislative Joint Committee on Administrative Rules (JCAR) to these landfill regulations as proposed at Second Notice. (This statement was conditioned on certain agreed style and format changes, which are identified in the Guide to the Appendices at the end of this Opinion.) This JCAR action completed the last procedural requirement necessary for final adoption. The regulations will become effective when they are filed with the Secretary of State. This final Opinion and accompanying Order is a culmination of an enormous effort by the Board, including its Scientific/Technical Section, as well as the

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* At the outset, the Board wishes to commend the Board's Scientific/Technical Section (STS) for the quality of its participation in this proceeding. Since initiation of this R88-7 docket, the principal STS contribution has been made by Dr. Harish Rao, STS Chief, with the assistance of Anand Rao and Morton Dorothy, STS environmental scientists. A special acknowledgment is due to Richard A. DiMambro, (during the course of his former employment as STS environmental scientist) both as coordinator of the various consultants and other experts whose testimony has been sponsored by the Board's STS during the course of the predecessor R84-17 proceedings, and as principal author of the 1988 STS Recommendations. The Board also acknowledges the contributions made to the 1988 STS Recommendations by Dr. Harish Rao, Dr. Gilbert Zemansky (during the course of his former employment as STS Chief), and Karen Mystrik (during the course of her former employment as STS librarian).

The Board also wishes to acknowledge the special contribution made by Senior Attorney, Kathleen M. Crowley, who has served as Hearing Officer throughout these proceedings, and who has participated in the drafting of the Board's Opinion and Order in this and related matters.

participants, both in this proceeding and its predecessor R84-17 proceeding, to vastly upgrade the non-hazardous waste landfill regulations.

These regulations apply to nonhazardous waste landfills, which include waste piles. Both "municipal" and industrial landfills are included, onsite and off-site, permitted and unpermitted. The landfills are regulated by waste received in three categories: putrescible, chemical, and inert. Existing facilities are divided into three general groups, based on their level of compliance: facilities that may remain open for an indefinite period of time beyond seven years, facilities that must close within seven years, and facilities that must institute closure within two years or are already scheduled to close in that time.

The proposal introduces a new method of setting groundwater monitoring standards which ties the site characteristics, design, operation, monitoring, and reporting into an integrated system. The groundwater standards also function as location and performance standards. The groundwater standards are based on the background quality of groundwater; the operator must demonstrate that the landfill will not cause a change in the background water quality at a point no greater than 100 feet from the landfill within 100 years of closure of the landfill. The regulations specify that a contaminant transport model be used for the groundwater impact assessment.

The regulations also require compacted earth liners, or in combination with a geomembrane, and leachate collection, treatment and disposal systems; gas monitoring, measurement collection and management system; detailed construction and operating oversight requirements; post-closure care for as many years as necessary at each landfill to demonstrate that contamination is no longer a problem; a trigger mechanism for prompt remedial action where indicated; location standards for sensitive areas; and more intensive permitting and reporting requirements.

This Opinion will include the procedural history, and will attempt to recapture the issues as they developed following the first First Notice, the second First Notice, and the Second Notice proposed opinions and orders adopted on February 25, 1988, March 1, 1990 and June 7, 1990 respectively. The Opinion proper will include from prior opinions sometimes verbatim discussions of certain issues where we feel it will be beneficial to have the subject matter "all in one place". However, much of the material showing the development of the rules in response to comments is contained in the three Scientific/Technical Section (STS) documents that accompanied the three earlier opinions noted above, namely Exs. 1, 26 and 33. Also, to the extent that the regulations reflect the Board's concurrence with the STS

recommendations in those documents, the Board accepts the underlying rationale, with the exceptions or additional discussion being noted in the Opinion proper. Therefore, the Opinion will also include, as appendices, the three STS documents; Appendix A1 is the March 7, 1988 Background Report; Appendix A2 is the March 1, 1990 Response to Comments; and Appendix A3 is the June 7, 1990 Response to Additional Comments on Proposed Parts 807, and 810 through 815.

Please note, however, that, since persons who have been on the notice list throughout have already earlier received the Appendices, these documents will not be included in this mailing, and will be later sent only upon special request.

MAJOR PARTICIPANTS

The record in this matter, developed in R84-17, Dockets A, B, C and D as well as in this R88-7 docket, is too voluminous for the Board to synopsize all testimony or comments presented. At the risk of inadvertantly omitting someone, we are listng the following individuals and organizations have participated in the hearings. We note that commentors are listed in the second First Notice and the Second Notie.

The Agency ("informal" Proponent in R84-17, Docket A)

Lawrence Eastep, P.E.
Permit Manager, Division of Land Pollution Control (DLPC)

Harry Chappel, P.E.
Manager, Compliance Section, DLPC

Monte Nienkirk
Manager, State Site Management Unit, Remedial Project Management Section, DLPC

Linda J. Kissinger
Environmental Protection Specialist, DLPC

Charles Mikalian, Esq.
formerly of Enforcement Programs

Scott O. Phillips, Esq.
Enforcement Programs

Phillip Van Ness, Esq.
formerly of Enforcement Programs
(currently employed by the Board)

Virginia Yang, Esq.
Enforcement Programs

Gary King, Esq.
Enforcement Programs

Edwin C. Bakowski
Manager, Solid Waste/UIC Unit, DLPC

Illinois State Chamber of Commerce (Proponent in R84-17, Docket B) Illinois Environmental Regulatory Group.

The R84-17, Docket B proposal was prepared by the Illinois Waste Regulatory Committee of the ISCC. Testimony concerning the language of the R84-17, Docket B proposal was presented by:

Sidney M. Marder, P.E.
Environmental Consultant

Jeffrey C. Fort, Esq.
Gardner, Carton and Douglas (formerly)

The Illinois Environmental Regulatory Group (IERG), formed in 1986, is an affiliate of the ISCC which currently represents some 36 Illinois Industries interested in the development of the state's environmental regulations. (P.C. 50, p. 1). Since formation of IERG, ISCC has not participated in the R84-17 docket as a separate entity. IERG has been represented in this proceeding by:

Sidney M. Marder, P. E.
Executive Director, IERG

Katherine D. Hodge, Esq.
General Counsel, IERG

James T. Harrington, Esq.
Ross & Hardies

In addition, both ISCC and IERG have sponsored technical testimony in R84-17, Dockets B & D and R88-7, concerning the properties of wastes generated by certain industries and the state of the research concerning disposal of such wastes. These industries, and their representatives have been:

Illinois Steel Group and Illinois Cast Metals Association
David H. Miller
Consulting Engineer
Michael Slattery
President, Illinois Cast Metals Association

Thomas M. Barnes, Venture Manager
Outokumpu, OY (sic)

Illinois Utility Industry:
Thomas Hemminger
Director of Water Quality, Commonwealth Edison

Thomas Kunes:
Executive Vice President, RMT, Inc.
Chairman, American Foundryman's Society
Committee 10F on Water Quality & Solid Wastes

Waste Management of Illinois, Inc. (Proponent in R84-17, Docket C)

Various representatives of Waste Management of Illinois (WMI), its parent corporation Waste Management, Inc. (WM, Inc.), and Waste Management of North America (WMNA), another WM, Inc. subsidiary, presented testimony in support of WMI's R84-17, Docket C proposal, as well as considerable comment concerning the STS R84-17, Docket D proposal and the Board's proposal in R88-7. The representatives for Waste Management have been:

Peter Vardi
Vice President For Environmental Management, WM, Inc.

Gary Williams
Director, Environmental Compliance WM, Inc.

Ronald Poland
Director, Environmental Engineering, WM, Inc.

John Baker
Manager, Environmental Monitoring Programs, WM, Inc.

John J. McDonnell, P. E.
Environmental Manager, WM, Inc.

Henry L. Martin
Manager, Gas Recovery, WMNA

Tom Tomaszewski
General Manager, CID Processing, WMI

Dale Hoekstra
General Manager, Midway Landfill, WMI

Dr. Jay Lehr
Professor of Groundwater Hydrology, Ohio State University;
Executive Director, National Water Well Association

E. Clark Boli
President, Meredith/Boli and Associates

Carolyn Lown, Esq.
WM, Inc.

Percy Angelo, Esq.
Mayer, Brown & Platt

STS (Proponent in R84-17, Docket D)

The STS sponsored the testimony of various witnesses in R84-17, Docket A, which testimony served as the basis for some components of the STS proposal supported by further testimony in R84-17, Docket D and R88-7. The STS witnesses and consultants, and the subjects of their testimonies were:

Richard A. DiMambro ERM, Inc. former Environmental Scientist, STS	STS R84-17D Proposal as principal drafter, and later in R88-7 as consultant
Morton Dorothy, Esq. Member, STS	R88-7 proposal financial assurance
Dr. Harish G. Rao Chief, STS	R88-7 proposal-revisions in response to comments
Dr. Richard C. Berg, Thomas M. Johnson, Dr. Bruce R. Hensel Dr. William R. Roy	Various geological considerations regarding landfill siting and potential for groundwater contamination
Dr. Robert A. Griffin Illinois State Geological Survey	Hydrogeologic Investigations
Dr. David E. Daniel Assistant Professor University of Texas	Landfill/Liners and other earthen barriers
Dr. Robert K. Ham Professor of Civil & Environmental Engineering University of Wisconsin	Generation and characteristics of landfill leachate and gas; Inert waste testing
Dr. Cecil Lue-Hing, Director of Research and Development Metropolitan Water Reclamation District of Greater Chicago	A case history of landfill leachate treatment at a publicly owned treatment works (MWRD Calumet Sewage Treatment Works)
Dr. Aaron A. Jennings, Associate Professor of Civil Engineering The University of Toledo (Ohio)	Groundwater contaminant transport modeling

Bruce Hensel	State Geological Survey Report, potential for groundwater contamination, numerical estimates

Department of Energy & Natural Resources

The Division of Energy and Environmental Affairs of the Department of Energy and Natural Resources (DENR) has participated throughout these proceedings for the purposes of determining whether DENR would prepare an economic impact study concerning the various proposals and the scope of any such study. DENR employees present for these purposes have included:

Bonnie Eynon Meyer
Coordinator, EcIS Analysis Program

Elliott Zimmerman
Resource Planner

Stanley Yonkauski, Esq.

Fred Zalcman, Esq.

Technical testimony concerning special waste disposal issues was presented by a representative of another division of DENR:

Dr. David Thomas
Director, Hazardous Waste Research and Information Center

The Board further notes that the Illinois State Geological Survey is also a division of DENR.

DENR's EcIS concerning the R88-7 was presented at hearing by employees of DENR's EcIS contractors, the consulting firm Camp, Dresser, and McKee. These individuals were:

Jeanne F. Becker
Wayne P. Pferdehirt
Kristine Uhlman

Illinois Chapter, National Solid Waste Management Association, and Various Landfill Operators

The Illinois Chapter of the National Solid Waste Management Association (NSWMA) has sponsored testimony and comments on behalf of the Illinois Chapter and its various member disposal facilities. As the Illinois Chapter has not provided the Board with a membership list, the Board is unsure of how many of the

individual waste management companies who have participated in this proceeding are NSWMA members. In listing these companies in this section for convenience, the Board is not implying that these companies are necessarily affiliated with NSWMA. These participants have been:

Joseph R. Benedict
former Chairman, Illinois Chapter, NSWMA
Director of Regulatory Affairs, Sexton Companies

Dr. Charles A. Johnson
Technical Director, NSWMA

Dr. Edward Repa
Institute of Solid Waste Disposal, NSWMA

Bob Peters
State Program Manager, NSWMA

Fred A. Prillaman, Esq.
Mohan, Alewelt, & Prillaman

James Ambroso
Chairman, Illinois Chapter, NSWMA
Environmental Manager, Land & Lakes, Co.

Carl Ball
President, Environmental Reclamation Co.

Paul DeGroot
President, States Land Improvements Co.

Leo Lentz
Modern Landfill Co.

Francis J. O'Brien
Environmental Control Manager, Browning Ferris Industries of Illinois, Inc.

William A. Speary, Jr., Esq.
Tenney and Bentley
former General Counsel, Pioneer Processing, Inc.

Environmental Groups

Various environmental groups have participated in these proceedings through their directors, as well as through counsel representing a coalition of groups. (Individual members of these groups are too numerous to list). These have been:

Patricia A. Sharkey, Esq., formerly representing in R84-17, Citizens for a Better Environment (CBE),

Great Lakes Sierra Club, McHenry County Defenders (MCD),
Center for Neighborhood Technology,
Coalition For Appropriate Waste Disposal,
South Chicago Development Commission

CBE: Kevin Greene
Research Director

Dr. Robert Ginsburg
former Midwest Research Director

MCD: Gerald Paulson
Executive Director

Greg Lindsay
Environmental Consultant

Environmental Consultants

In addition to those previously listed, various environmental consulting firms have participated, particularly in R84-17, Docket D, on behalf of themselves or their clients.

James Douglas Andrews, P.E.
Andrews Environmental Engineering

Darryl Bauer
Baxter and Woodman, Inc.

Daniel P. Dietzler, P.E.
Patrick Engineering, Inc.

Richard W. Eldredge, P.E.
Eldredge Engineering Associates, Inc.

Roberta L. Jennings
Consultant Hydrologist

Other Companies

Gary Kolbasuk, Technical Manager
National Seal Company

Mark Steger, Esq.
McBride, Baker and Coles

Gerald F. Berry, Sales Engineer
Phillips Fibers Corporation

PROCEDURAL HISTORY

Predecessor Dockets to R88-7

The Board will again summarize the procedural history in this proceeding, but also references the reader to summaries of certain issues in the three prior R88-7 proposed opinions.

The Board adopted its "Chapter 7" regulations covering operations of sanitary landfills in 1973. These regulations, since codified as 37 Ill. Adm. Code Part 807, have remained virtually unchanged since that time, save for the addition of regulations concerning financial assurance for closure and post-closure care. In 1976, the Board adopted its "Chapter 9" regulations concerning the hauling of special waste. These regulations, since codified as 35 Ill. Adm. Code Part 809, have also existed virtually without change, except for the addition of regulations concerning hauling and disposal of hazardous hospital waste.

Abortive attempts to modernize these rules commenced in the 1980s. Docket R80-20 was initiated by a proposal of the Illinois Environmental Protection Agency (Agency) to update Chapter 7, and Docket R81-31 was initiated by a Board proposal to update Chapter 9. These proposals were consolidated and dismissed by Order of the Board on October 5, 1982, after hearings indicated that extensive revision of the proposals was necessary. In that Order, the Board noted that:

> The Agency and the Illinois State Chamber of Commerce [ISCC] indicated that they were working together on a substitute proposal which would replace both Chapters 7 and 9. During [the hearing] process it has become clear first that the subject matters of Chapters 7 and 9 require coordination to insure consistency and, second, that it will be difficult to relate the testimony on the former proposals to the evolving combined proposal. The Board therefore hereby consolidates R80-20 and R81-31, and at the same time dismisses both.

In that same Order, Docket R82-21 was opened to consider the anticipated Agency/ISCC proposal for permits for waste management and hauling, and Docket R82-22 was opened to consider the anticipated proposal for landfill operating criteria. The Agency filed a proposal in the R82-21 docket only, which proposal was the subject of hearings. Both dockets were closed by Order of June 16, 1983, as a result of Agency withdrawal of its R82-21 proposal. The proposal was withdrawn, as the Agency believed

that the best solution to various problems identified at hearing was submission of an amended and expanded proposal.

Docket R84-17, was initiated to consider a draft proposal filed by the Agency on May 31, 1984. Two inquiry hearings were held at which participants identified concerns with the proposal and questioned the Agency concerning its intent. At the last hearing the Agency indicated its intention of filing a revised proposal. As the Board noted in its Resolution of December 6, 1984 announcing its intention of committing some of the resources of the Scientific/Technical Section (STS) to this proceeding, no revised proposal had been submitted. Although the Agency has been a very active and helpful participant in subsequent phases of this proceeding, it has not filed a new proposal or presented evidence in support of its draft proposal.

On April 4, 1985, the ISCC filed an alternate proposal. By Order of April 18, 1985, the Board established R84-17 Docket B for consideration of this proposal. Four hearings were held in Docket B concerning this proposal.

On August 15, 1986, Waste Management of Illinois filed another alternate proposal, which the Board designated as R84-17 Docket C. This proposal was the subject of nine hearings.

Concurrently with the hearings held in Dockets B and C, the Board held additional hearings in Docket A. The purpose of these hearings was presentation of testimony by various consultants and other scientific experts whose appearance was arranged by the STS. These consultants and other experts did not critique the various proposals pending before the Board, but instead provided testimony concerning their research and experience concerning subjects integral to analysis and/or development of comprehensive regulations for the management of waste.

By its Order of February 19, 1987, the Board determined that only one additional hearing would be held in Dockets A, B, and C. One basis for this determination was that:

> "The record to date in R84-17 is sufficient to enable the Board to determine that, while each proposal has meritorious components, no single proposal pending before it is sufficiently refined or comprehensive to be adopted by the Board as the Board's own proposal for the purposes of first notice publication pursuant to the Illinois Administrative Procedure Act, and resulting additional hearings. It is clear to the Board that the Board itself, with the assistance of its scientific/technical and legal staff, must craft a proposal to address

the sum of the various concerns which have been brought to the Board's attention."

The Order went on to establish the form and procedures for the filing of a proposal by the STS, including required filing of documents for public inspection contemporaneously with distribution of copies to the Board Members, consistent with ex parte restrictions articulated in the Board's "Protocols of Operation For the Scientific/Technical Section", RES 86-1, January 26, 1986 and the Board's Procedural Rules, 35 Ill. Adm. Code 101.121.

By Order of March 5, 1987, the Board established that the final hearing in Dockets A, B, and C would be held on April 28, 1987, that the public comment period would close on May 20, and that the Board would commence deliberations on May 28, 1987.

Consistent with the directives in the Board's Orders of February 19 and March 5, 1987, on May 22 and May 26, 1987, the STS filed an initial set of proposed regulations consisting of new Parts 810, 811 and 812 with its supporting "Recommendations for Non-Hazardous Waste Disposal Program in Illinois and A Background Report To Accompanying Proposed Regulations For Solid Waste Disposal Facilities" (Background Report). On June 12 and June 21, 1987, the STS filed another set of proposed regulations, consisting of Parts 813 and 814 and a supporting Background Report

By Orders of May 28 and June 22, 1987, the Board authorized the STS proposal for hearing. The May 28 Order established a Docket D for consideration of the STS proposal. The Board expressly noted that it was taking no action at that time on the proposals in Dockets A, B, C.

The STS proposal was the subject of ten hearings. To expedite the proceedings, participants were required to file written questions and comments concerning the STS proposal, to which the STS provided written responses to be discussed at hearing. The comment period was closed in Docket D on December 30, 1987.

At hearing, the STS had committed to redrafting various portions of the proposal in response to testimony and to consider redrafting in response to any subsequent written comment received. Accordingly, the STS filed revised versions of various portions of its proposed rules and Background Report on January 15, February 4 and 18. Consistent with prior practice in this docket, the STS dealt with the Agency's untimely comment, filed January 5, 1988, as a matter of discretion and to the extent that time permitted.

By Order of February 4, 1988, the Board adopted an Order which realigned its relationship with the STS. The Board's Order stated:

> The Board has been deliberating the STS revised proposal, as well as the records in Docket A, B, & C since January 21, 1988. The Board has limited its discussions with the STS consistent with the February 19, 1987, Order and the Board's Protocols. The Board has found that in order to fully and expeditiously deliberate these matters it is necessary to informally consult with STS staff concerning the technical details in the voluminous R84-17 record.
>
> As the bases for and comments concerning the STS proposal are a matter of public record, the Board now feels that it may, without prejudice to the integrity of its process, terminate its "arm's length" dealing with STS staff. Accordingly, as of this date, the STS staff will no longer be considered "exterior" to the Board within the meaning of the Protocols. STS staff is directed to resume communications with the Board in the usual Board/staff relationship. The ex parte constraints of 35 Ill. Adm. Code 101.121(b) shall apply to STS communications with persons other than Board Members and staff.

Deliberations continued on February 5, 1988.

On February 11, 1988, the Board adopted an Order directing its staff to develop a revised proposal for its consideration on February 25, 1988 finding that:

> The Board is in full agreement with the essential elements of the proposal. However, the Board wishes to see regulatory language embodying certain concepts which either are not contained in the existing proposal, are not clearly expressed, or are alternative to those presently proposed.

Docket R88-7

As earlier explained, Docket R88-7 was opened by the Board's Opinion and Order of February 25, 1988. The proposal was published at 12 Illinois Register 7069 et seq., April 25, 1988. DENR commenced preparation of the EcIS, and further formal proceedings of the Board were accordingly held in abeyance until

June, 1989. On June 16 and 20, the Board conducted two hearings to receive into the record testimony and exhibits commissioned by the Board's STS from outside consultants who had previously had major roles in the R84-17 proceeding.

Mr. Bruce Hensel, of the Illinois State Geological Survey, presented the study commissioned by the STS alluded to in the Background Report and at hearing, entitled "Numerical Estimates of Potential For Groundwater Contamination From Landfill Burial of Municipal Wastes in Illinois" by Bruce R. Hensel, Richard C. Berg and Robert A. Griffen. (Ex. 7). Dr. Robert K. Ham, Professor of Civil and Environmental Engineering, University of Wisconsin, presented narrative testimony regarding landfill siting performance and design requirements and potential for groundwater contamination. Richard A. DiMambro, primary author of the STS Recommendations and Background Report in the R84-17 proceeding during the course of his former employment with the Board was available to participate in discussion of any issues relating to the proposal.

Members of the STS who participated on both hearing days were Dr. Harish Rao, STS Chief and Mr. Morton Dorothy. Mr. Dorothy presented his concerns regarding problems with the existing financial assurance regulations particularly as they related to the extended post-closure care period. Draft amendments to the financial assurance rules were presented for initial discussion.

Additional testimony and comment was also presented on June 20 by the Agency and WMI.

On September 12, 1989, DENR filed its EcIS. At hearings held on November 17 and 27, 1989, DENR's EcIS contractors, the environmental consulting firm of Camp, Dresser and McKee, presented the EcIS and answered questions concerning it. Participants who presented testimony in response to the EcIS included WMI and the Illinois Utilities, speaking on their own behalf as well as that of IERG. The post hearing comment period expired on January 2, 1990.

In response to the first First Notice proposal in 1988, the Board received 24 public comments.

On February 16, 1990, at the Board's request, JCAR submitted its concerns and comments (JCAR concerns), based on its preliminary review of the 1988 proposed rules.

As was the case in the R84-17 docket, the Board directed its STS to prepare for review by the Board an analysis of the public comments received, and any recommended amendments to the rules which it believed were warranted by the comments or hearing

record. As earlier stated, the STS comments were marked as Exhibit 26.

Then, on March 1, 1990, the Board adopted a second First Notice Opinion and Order. As explained in greater detail in that Opinion, Section 5.01(d) of the APA requires a repeat First Notice if more than one year has passed before going to Second Notice. The one year period had expired April 25, 1989 during the period in which the required Economic Impact Study (EcIS) was being prepared.

The rules proposed by the Board in its second First Notice Order were published in 14 Illinois Register 3834 et seq., March 16, 1990. There were a number of changes from the first First Notice proposal. The Board also scheduled another hearing, held on April 6, 1990, and accepted comments until May 1, 1990. As noted in the Second Notice Opinion, 14 comments were received.

On June 7, 1990, the Board adopted its proposed Opinion and Order for Second Notice and submitted it to JCAR, which considered it at its July 26, 1990 meeting and, as noted earlier, voiced no objection.

SPECIAL ISSUES

As stated earlier, the earlier adopted Opinions and Orders and the STS documents have been structured to "track" the issues raised at the 35-odd hearings and the public comments, and the ongoing regulatory language responses. We do not feel that it would add to an understanding of the regulations to regurgitate or otherwise re-discuss them here. In most all instances the issues have not been re-raised as the proceeding went forward. However, there are a number of important areas that bear repeating here either because the issues have been a source of confusion or ongoing contention, or because we perceive a need for emphasis.

The EcIS

The Act requires the Board to consider the results of the EcIS and other economic information in the record. Thus, we believe that it would be appropriate to repeat here the summary of the EcIS contained in the second First Notice.

As earlier stated, the EcIS (Ex. 10) was filed with the Board by DENR on September 12, 1989. Two hearings were conducted, on November 17 and 27, 1989. At the first hearing, the Opinion of DENR's Economic and Technical Advisory Committee was also submitted (Ex. 14); that Opinion concurred with the conclusions of the EcIS, and particularly agreed that it is extremely difficult to quantify the incremental avoided health costs, but that they are substantial. The Opinion also agreed

that the indirect impact on employment and disposable income was comparatively insignificant.

We will summarize the broad conclusions of the study here, utilizing the Executive Summary (EcIS E-1 through E-8), and will reference detailed breakdowns elsewhere in the EcIS where the EcIS' conclusions were disputed at hearing or in public comment.

Only the incremental impacts of the proposed rules as compared to the existing rules were evaluated. The study in many areas utilized the Agency's implementation of the more generally worded existing Board rules for comparison purposes. The study noted that the incremental costs will, in general, be greater for existing than new facilities, because most recently proposed new landfills already incorporated features of the proposed rules. Also, costs for onsite (exempt from permitting by Section 21(d) of the Act) facilities will generally be higher than for those off-site, since onsite facilities are typically built to lower standards. This is because, under the proposal, although the Section 21(d) permit exemption will still be in effect, those facilities will be explicitly required to meet the same design, operating, closure, and post-closure requirements as will off-site facilities.

Benefits were estimated to be substantial, especially with respect to reducing the potential for groundwater contamination from landfill leachate. Avoided costs include cleanup and remediation. The study notes that there is substantial disagreement about how to place an economic value on the degradation of a natural resource, certainly on a Statewide basis.

The annualized incremental costs for development and operation of new onsite and off-site landfills combined is estimated to be about $42 million by the year 2005. This estimate assumes that only "new" facilities, as defined in the proposal, will be operating at that time. Also, during the early years, the incremental annualized cost to operate and close existing facilities, both off-site and onsite, is estimated to be $75 million. This cost will decline to the $42 million estimate for 2005 because new landfills (which includes new units at existing sites) will begin to replace those upgraded and operated under the Board's proposed interim standards.

Disposal costs were estimated to rise to about $7.37/ton for existing landfills and not more than $3.58/ton for new landfills. If these costs are wholly passed on to residences, there would be a resulting increase disposal cost of about $0.89 and $0.43 monthly per household respectively; however, if a community's existing landfill had to close prematurely under the proposal, there would be additional temporary cost increases.

Further costs may also be avoided under the proposal by the reduction of the rate of leachate generated, the amount of leachate available for escape, the reduction of leachate contact time, the quality control over liner construction, and improved monitoring and response requirements. While a comparative analysis is difficult, a rough estimate of annual savings Statewide in operating and maintenance costs resulting from fewer future remediation projects at off-site landfills was estimated to be about $14 million per year. Regarding onsite facilities, the capital costs for remediation are estimated to be reduced by $46 million total; assuming that about one-half of the sites will eventually require remediation, operations and maintenance savings at these sites are estimated to be $15 million per year.

The study also noted that an unquantifiable, but potentially significant, benefit was avoided costs to repair damage caused by landfill gas, including gas induced explosions and damage to final cover vegetation, and the health and environmental threat from escaping, potentially toxic, landfill gases.

While other direct and indirect benefits and costs were identified, they were considered minor in relative terms.

The second First Notice Opinion includes the Board's consideration of, and response to, the issues raised in comments and testimony at hearing, which will not be revisited here, except insofar as they involve the issue of contaminant transport modelling, which is discussed below. The Board, pursuant to Section 27(b) of the Act, repeats here its determination that the regulations "are economically reasonable and that they will not have an adverse economic impact on the people of the State of Illinois".

Definitions

Defining Landfill to Determine Regulatory Scope

One of the most fundamental tasks in framing regulations is to make as clear as possible what operations are subject to the regulations. When the Board proposed the instant regulations on February 25, 1988, it re-titled the proposal to reflect its intent that these regulations apply to non-hazardous waste landfills. Included are those landfills exempt from the requirement to have a permit pursuant to Section 21(d) of the Act.

It became clear that the Board would have to defer to another proceeding the crafting of regulations to properly address the rest of the universe of storage, treatment and disposal solid waste facilities. If the Board attempted here to be all inclusive, it was clear that the development of a record to accomplish this would even further postpone the adoption of

the landfill regulations. The comments themselves point out the difficulty of distinguishing what is a landfill, much less distinguishing other types of facilities and the related questions as to what constitutes storage, transfer stations, treatment, recycling etc. in a regulatory context. We fully share the concerns about the potential environmental impact of other activities; however, as earlier explained, to fail to address an area of critical concern now, and instead wait until some future time when we can address everything is unacceptable. We also wish to preserve the enforceability of these regulations by assuring that they are not selectively applied, i.e. that pieces of the regulatory scheme are ignored in an attempt to expand the universe. We note that these issues were addressed in the first R88-7 First Notice Opinion and further addressed in R88-8, Census of Solid Waste Management Facilities Exempt from the Permit Requirement as Provided in Section 21(d) of the Act, 35 Ill. Adm. Code 808, February 25, 1988.

Defining what is or is not a landfill requires one to look at other long standing terms of art such as land application or treatment units, surface impoundments, and waste piles. The testimony and comments clearly indicate that the definitions need improvements, and we have adopted language changes that more clearly reflect distinguishing features among these terms. However, the definitions must also be read in conjunction with what the regulatory standards require an operator to abide by. As noted earlier, any selective application of the regulatory provisions are not allowed unless specifically provided for in the regulations themselves.

We have included the term land application unit (in place of land treatment unit) and made changes to its definition as well as to the definitions of landfill, surface impoundment and waste pile.

The term "landfill" always connotes disposal, unlike the other terms, which can connote storage, treatment or disposal. We have retained the term "disposal" for landfills, but have removed the word "disposal" from the definitions of land application unit and surface impoundment; defining them in terms of disposal, as opposed to treatment or storage, is not necessary here, since they are not proposed to be regulated under this proposal in any event.

Another distinguishing, though not unique, feature of a landfill is that the waste is accumulated over time and is not going to be removed from the site. This may or may not be true of a surface impoundment, which receives wastes in liquid form and where the solid residues accumulated over time may be transported to another site for final disposal. Further the record developed during this lengthy proceeding did not focus or

elaborate on what kinds of regulations would be appropriate for the various "pits, ponds and lagoons" in this state. The definition is intended to clarify what must be shown to avoid being regulated as a landfill; a flooded out dump would not be exempt. As earlier stated, regarding a land treatment unit, we note that the term is more appropriately termed a land application unit in the context of solid waste. Whether the activity is for treatment or not is not relevant to this proceeding. Also, the word "agronomically" has been added to make clear that, if waste is accumulated over time at a rate greater than the agronomically determined rate, the unit is subject to being regulated as a landfill, no matter what it is called. There must be some clear, positive interactive relationship shown between the soil and the amounts incorporated. If the activity is serving an agronomic purpose, then requiring such things as liners and daily and final cover would not make sense.

Regarding waste piles, we continue to believe that there is no persuasive reason to treat them as other than landfills as a general proposition. However, we have specified the showing an operator must make (e.g. that the wastes are not accumulating over time) to allow for those activities where the waste is truly being routinely removed, for whatever purpose. We recognize that there will probably be more "gray areas" to be resolved here than elsewhere. Part of the problem is the mentality that has grown up over the years that "it couldn't be a landfill if it didn't start as a hole in the ground." We no longer think that mentality is defensible. In any event, we believe that, with the proposed language, operators of temporary waste piles would be well advised to maintain records or other information for documentation if they do not wish to be regulated as landfill operators. It is particularly difficult for others to easily ascertain whether waste is or is not accumulating. The intent of the language is to put the onus on the operators to demonstrate that it is not.

In this context, the Board notes the concern of one of its Members that tighter regulation of waste piles could adversely affect the agricultural community, given the common practice of piling debris cleared from fields and ditches for later disposal. The Board believes that the above-described treatment of waste piles "exempts" these individual from enforcement provided that disposal elsewhere does occur on a routine basis.

Finally, the STS suggested definitions of storage and treatment have been deleted and an optional addition to the statutory definition of "disposal" has been modified accordingly. The Board declined to propose storage and treatment additions at this time, for reasons earlier explained.

Part 811 Subpart B Inert Waste Landfills

The Board requested more specific comment from those who have addressed the stringency of the inert waste definition and the sufficiency of the proposed groundwater protection safeguards for inert waste landfills. Regarding the groundwater protection safeguards, some felt that a groundwater monitoring program should be included. One Board Member felt groundwater monitoring as well as location standards might be necessary to detect and reduce harm from the inadvertent or intentional disposal of unauthorized wastes. We requested that any commentors specifically identify what, if any, components of a groundwater monitoring program might be appropriate, as well as the implications of such requirements for inert landfill classification and requirements as proposed, including the definition of inert. We requested that commentors address the following components of a groundwater monitoring program: what hydrogeological site investigations should be required to establish the location and number of monitoring wells; what standard should apply and what constituents should be monitored; what would be the compliance point and what would trigger remedial action (assessment monitoring, corrective action etc.); what reporting and operating requirements should be included; and what requirements should apply to existing facilities and to new facilities. Regarding operating requirements, we also requested comment as to whether the random load checking requirements in Part 811.Subpart D, or some other load checking requirement, might be appropriately added to these regulations as a safeguard against non-inert waste loads coming to the landfill.

A Board Member was also concerned that the inert waste demonstration does not require that acidity of rainfall be taken into account. He noted that rainfall in Illinois has an average acidity of about pH 4.2, and that "inerts" ought to be tested with water acidified at least to that level rather than with unacidified water, which in the Chicago area at least is on the alkaline side. We requested comment on this issue to ascertain the adequacy of the Section 811.202(b)(2), regarding extraction fluid requirements.

After reviewing the comments and testimony at the hearing, following second First Notice, the Board concurred with the STS proposal for more stringent regulations for inert waste landfills. The Agency did not address this question and no other comments with real specificity were received. At hearing, it was pointed out that there is a need to assure that leachate can be sampled, if that is what to be monitored over time. (R. 635, 636). The STS questioned the benefits of using a monitoring well approach without the concommittant hydrogeological investigation, and instead had proposed a random load checking system similar to that for non-inert landfills, while continuing to collect and test the leachate itself to determine compliance but with added

monitoring and reporting requirements. If subsequent contamination is verified, the landfill would lose its "inert" classification, and become subject to the regulations applicable to putrescible or chemical waste landfills. We believe that this approach will serve the dual purpose of first providing environmental protection against the future disposal of non-inert waste, and at the same time keeping truly inert waste from using up air space in the putrescible or chemical waste landfills.

Existing Landfills, Timing of Closure

There has been some confusion regarding Part 814 and how it applies to existing facilities. In addition to the STS responses to questions regarding Part 814 contained in Ex. 26, pp.249-255, a more detailed description of that Part is provided below.

All existing landfill facilities are required to notify the Agency (in accordance with Section 814.104), within six months of the effective date, principally with regard to the facility's estimated date of closure of existing units and state whether the facility is subject to the requirements of either Subpart B, C, D or E.

Pursuant to Part 814, if an existing facility is unable to meet the requirements of Subparts B or C and D, then it is subject to Subpart D and such a facility will have to initiate closure within 2 years of the effective date of the Part subject to the existing operation and closure standards of Part 807. All other existing facilities subject to Subparts B, C or D are required to submit information, as required by 35 Ill. Adm. Code 812, to the Agency demonstrating compliance with the appropriate Subpart. Such information (for unpermitted facilities), or an application for significant modification of a permit in accordance with 35 Ill. Adm. Code 813 (in the case of permitted facilities), is to be filed with the Agency within 48 months of the effective date of the Part or an earlier date specified by the Agency. One example of when an earlier date may be specified by the Agency is a situation in which the existing unit or facility, subject to Subpart D, has plans to close within 4 years (48 months) of the effective date of the Part.

An existing facility accepting inert wastes only is subject to Subpart B, if it remains open indefinitely (after the effective date) and is able to meet the requirements of 35 Ill. Adm. Code 811 Subparts A and B.

An existing facility accepting chemical and putrescible wastes is subject to Subpart C, if it remains open beyond 7 years after the effective date of the Part and is able to meet the following:

1) Requirements of 35 Ill. Adm. Code 814.302(b) for an effective leachate management system, protection against slope failure, calculation of the design period for purposes of financial assurance; and

2) The requirements for new units specified in 35 Ill. Adm. Code 811 except for the exemptions specified in 35 Ill. Adm. Code 814.302(a). The major exemptions are with regard to the location standards, foundation and mass stability analysis standards, the liner and leachate drainage and collection requirements of Part 811, final cover requirements and the comprehensive hydrogeological site investigation requirements. However, hydrogeologic information sufficient to establish a groundwater monitoring program to meet the water quality standards of 35 Ill. Adm. Code 811.320 is required.

An existing facility accepting chemical and putrescible wastes is subject to Subpart D, if it remains open beyond 2 years but no longer than 7 years after the effective date of the Part and is able to meet the following:

1) Requirements of 35 Ill. Adm. Code 814.402(b) regarding prohibition against expansion of the facility or accepting new special wastes, meeting the groundwater standards as specified in 35 Ill. Adm. Code 814.402(b)(3) and calculation of the design period for purposes of financial assurance; and

2) The requirements for new units specified in 35 Ill. Adm. Code 811 except for the exemptions specified in 35 Ill. Adm. Code 814.402(a). The major exemptions are with respect to the location standards, foundation and mass stability analysis standards, the liner and leachate drainage and collection requirements, the hydrogeological site investigation requirements, the groundwater impact assessment standards, the groundwater monitoring requirements and the groundwater quality standards of 35 Ill. Adm. Code 811.320.

Another area concerning Part 814 that requires further explanation is the issue of which rules are applicable to new units at existing facilities. A question was posed by Mr. King from the Agency during the April 6, 1990 hearing concerning the potential for conflict between the applicability sections of Part 811 and Part 814 and asking whether Part 811 or Part 814 applied to new units at existing facilities. The response provided by Dr. Rao at hearing was as follows:

> "Part 814 would be applicable to new units at existing facilities. However, the applicable standards would come from Part 811. So there

> are certain parts of 811 that would apply to new units at existing facilities."
> (R. 435-436)

It should be noted that the response invokes the applicability of Part 814 because an existing facility is involved, and is correct in that Part 811 standards would be applicable. We believe that some further explanation is desireable. However, it should be kept in mind that any application of Part 814 must be viewed from the perspective of the Board's primary goal - to bring the State's landfills under the regulations for new landfills as quickly as possible. We emphasize that the term "new unit" (and "new landfill") in these regulations are defined in Part 810 and "come into being" after the effective date of these regulations, and refer to units first receiving a load of waste after the regulations are filed with the Secretary of State. How Part 811 applies in Part 814 must be read in this context. The requirements of Part 811 apply to all new units, unless the Board grants special relief in these regulations or later by way of, say, an adjusted standard.

Part 814 addresses the special concern of how to regulate existing landfills as they are phased-out. The two year/seven year/beyond seven years time frames for closure and accompanying requirements of Part 814 obviously apply to existing units already receiving waste at the time the rules become effective. The applicability of Part 814 to what we will call, for purposes of discussion only, "permitted" new units, i.e., units which were permitted but had yet to receive the first load of waste, is not so obvious if such units are in existing landfills subject to either the requirements of Part 814, Subpart D (i.e. standards for existing units that may not remain open beyond seven years) or the requirements of Part 814, Subpart C (i.e. standards for existing units that may remain open beyond seven years).

Those "permitted" new units in an existing facility subject to Part 814, Subpart D are to be treated as existing units as long as the following two circumstances exist. First, they were permitted before the term "new unit" had come into effect and, second, the units do not expand beyond the area included in the permit. Waste may be placed in such "permitted" new units subject to the requirements in Part 814, Subpart D, including the requirement that that they remain open for no longer than seven years. The Board further notes that Subpart D does not allow new units to be opened, meaning that an operator wishing to extend further beyond what was previously permitted must comply with the requirements of Part 811.

Unlike Subpart D, "permitted" new units that have yet to receive waste, in an existing facility subject to Part 814, Subpart C are not treated as existing units because they can potentially remain open for a much longer period of time. The

requirements of Subpart C for existing units, those that are already receiving wastes, do take into account the extended period of time that the unit will remain open as well as the high costs of retrofitting existing units.

Liner Depth and Composition

Only the Agency continued to insist on a minimum 10 foot liner. The Board believes that it would clarify the Board's position by repeating comments in the Second Notice Opinion. (p. 9)

The issue of liner depth and composition persisted throughout this proceeding. The first First Notice proposal included the recommendation by the STS, which remained unchanged throughout, that a minimum earth liner of three feet provided an adequate margin of safely, given the performance standards, the requirements for construction quality assurance, hydrogeological investigations, liner construction and foundation, ongoing leachate collection, etc. The Board recognized that these interrelated design and operating requirements reflected a technically supported conclusion that, in terms of environmental protection, the traditional heavy reliance on a liner as a containment barrier is an inferior approach. However, it requested comment on the advisability of increasing the liner to five feet (p. 56).

After further testimony and comments, the Board concluded, in its second First Notice Opinion, that "it is prudent to require an extra two feet to guard against an unanticipated potential for error in implementing the regulations that might be sufficient to cause more reliance on the liner than was intended." (p. 41). The Board then requested more comment about the merits of a three foot compacted clay liner plus an artificial liner as an alternate minimum.

After considering testimony and post-hearing comment at the hearing following the second First Notice request, the Board agreed with the explanation and recommendation of the STS that this alternate minimum be allowed. The Board stated that the record "indicates that a three foot compacted clay liner plus a geomembrane liner directly applied on top of it has demonstrated capabilities equal or superior to the recompacted five foot liner, at least for non-inward gradient landfills, both in terms of leachate capture and as a leachate barrier". (p. 6).

The Agency, in reference to Section 811.306, continued to insist that anything less than a minimum 10 foot liner is insufficient protection of the environment. (see Para. 7). The Board believes that its proposal for a minimum five foot liner, as well as its proposed alternate of a three foot liner plus a geomembrane, is more than justified by this record. In addition

to the comments of the STS, we make the following observations. Except for the Agency's "fence post" problem which we have taken care of, the Agency has not presented any scientific or technical justification as to the environmental enhancement to be gained by requiring a minimum ten foot liner in the proposed regulatory scheme. Nor have others. Nor have the other participants agreed with the Agency's position. It was generally recognized that these regulations are crafted to change the traditional reliance on a liner. The issue then was whether the minimum liner thickness should be three feet or whether it should be five feet. For example, while supporting five feet as an add-on safeguard, the McHenry County Defenders and the Citizens for a Better Environment, in a jointly filed Comment, nevertheless state:

> Based on the STS Background Report and testimony presented at hearing, we agree that a three-foot thick clay liner, constructed in relatively thin, well compacted lifts to achieve field hydraulic conductivities of $1x10^{-7}$ cm/sec or less can provide sufficient containment of contaminated leachate, when used in combination with a properly designed and operated leachate collection system.
>
> (P.C. 11, p. 4, June 6, 1988)

The Board believes that this record amply supports the superiority of the panoply of detailed site hydrogeology investigations coupled with the design and operation of leachate control systems embodied in these regulations. We particularly disagree with the Agency's blanket assertion, without any documentation whatsoever, that allowing the minimum 5 foot liner places the State behind other states in environmental controls at "sanitary landfills". We strongly suggest that the Agency's selection of liner thickness as its sole measure of comparison with other states' regulations reflects undue, and outdated, dependence on the passive use of a liner as the only means of preventing the escape of leachate. The record clearly shows that this dependence is not justified. In addition, the Agency's assertion fails to recognize that a specific site location is not precluded from adopting or being required to adopt a liner thickness greater than the minimum if conditions at the site warrant it.

Section 811.101 Delayed Applicability of the Regulations.

One of the more difficult issues for the Board to "get a handle on" was the request from the steel, utility and foundry industries for a delayed applicability of the Part 811 standards for new and existing landfills. Because we feel that the

situation is still capable of causing confusion, the Board will repeat here comments in the Second Notice Opinion.

Section 811.101(b) as had been proposed in the second First Notice provided for a delayed applicability of Part 811, Standards for New Solid Waste Landfills. More specifically, the effect of the proposed language was to "stay" the applicability of these rules to new landfills, accepting waste only from the steel, utility and foundry industries, for the period of time between the date when the regulations become effective (i.e. when they are filed with the Secretary of State) until December 1, 1990. If the industries filed a proposal of general applicability to the industry category no later than December 1, 1990, then the "stay" would have continued in effect for new landfills for two years after the filing with the Secretary of State. If the industries did not timely file, Part 811 became effective immediately, on December 2, 1990. During the period of delayed applicability of Part 811, the landfills were to be subject to the now existing Part 807 standards.

The Agency continues to strongly oppose granting any delayed applicability of the regulations to the steel, utility and foundry industries. (see P.C. 34, Para. 3) It asserts that persuasive evidence is lacking regarding a lesser environmental threat by these landfills, and that the industries have had more than sufficient time to present a proposal. The Agency recommends deletion of Section 811.101(b).

WMI also questioned the merits of the temporary exemption, noting that the exemption could encourage the industries to establish new landfills to a lesser design in the interim, and that, while the utilities have made an effort to prepare and present alternative proposals, the foundries have only done studies, and the steel industry has yet to present anything demonstrating a good faith effort. WMI asked how the new landfills are to be designed in the interim; if the purpose is to subject such landfills to industry specific rules, then the Board should make the new landfills subject to the Board's regulations until the new rules are adopted, noting that there is no evidence that the on-site operators are running out of space. WMI thus appears to agree with the Agency. WMI also asked for further clarification as to how on-site landfills can use alternatives to the basic Board standards, and how they are to proceed when Agency approvals are required. (R. 546-548)

The Illinois Steel Group and The Illinois Cast Metals Association, (Steel), in a joint comment, (see P.C.36) asserted that IERG, on January 2, 1990 (P.C. 24), had requested that existing on-site facilities also be included in the "stay," pending new industry specific rules for existing landfills. Regarding new landfills, they argue that they should be subject to the now-existing rules, and should then be allowed to make

whatever modifications are necessary to comply later with the industry specific standard. In support, Steel argues the anomaly of having existing facilities, receiving the exact same waste, having to begin efforts toward retrofitting if they want to stay open beyond the two year phase-in period in the new rules, while new landfills would be presumably subject to a lesser standard. Steel suggests that the Board, in proposing a temporary exemption for new landfills, apparently feels that there is some merit in the industries' belief that a lower degree of control is necessary for these wastes. Steel wants, therefore, a two year exemption for new facilities and the grandfathering of existing facilities operated on-site, with the Board accepting a proposal in December applicable to both new and existing facilities.

Caterpillar Inc. (Caterpillar) in its comments (P.C.37) noted that its Mapleton Plant is a gray iron foundry, located in Peoria, which operates an 82 acre onsite landfill into which they dispose of 80 to 90 thousand tons per year of waste foundry sand. They generally agree with the "proposed regulation language previously submitted by the Cast Metals Association (ICMA) regarding monofills and beneficial reuse". (We note that we are uncertain as to what "proposed regulation language" Caterpillar is referring to.) Caterpillar asserted that the landfilling costs for the Mapleton Plant would go from $4.49/cubic yard to $15.25/cubic yard, a 240% increase, if the company had to dispose off-site, and that this would represent an increased annual disposal cost ranging from $645,000 to $710,000. Caterpillar also noted that off-site landfilling would reduce the available "public" volume for wastes needing "a high level of containment". Caterpillar also asserted that the wastes being moved over public highways would increase, with a resulting increase in infrastructure wear, traffic congestion and increasing bureaucratic burden to "follow waste handling and transportation in the public sector".

We can only note that the ground continues to shift regarding the industries' intent, timetable, and what they are requesting, including whether their proposal would cover existing landfills. (See e.g. R. 65, and second First Notice Opinion, p. 38-40, which we believe reflects the situation at that time as accurately as possible after careful review of a confusing record).

For the reasons expressed in the second First Notice Opinion, we do not believe this record supports special relief for all these already existing landfills, whether called "grandfathering" or "exemption". Like any other existing landfills, they can singly seek to demonstrate the need for temporary or long term relief, including during the lengthy phase-in period already provided in these regulations. There also is nothing in the Act preventing the industries from proposing generally applicable regulations as to a category.

Regarding the anomaly asserted by Steel if we do not include existing landfills, we note that, if there is any anomaly, the anomaly also supports the notion that the Board should not grant any relief to new landfills either. Regarding new landfills, the Board particularly disagrees with the suggestion by Steel that, in granting a "stay", the Board has pre-determined the merits of the proposals to be filed in December. Also, we share the concern that the delaying of the applicability of Part 811 might provide an incentive to industry to build new landfills in the interim, so as to be subject only to the existing regulations. We suggest, however, that any industry doing so is truly "rolling the dice". They would be gambling on what would be the nature of the regulations that would apply to them in the near future as new landfills (the "stay" would not affect their designation as new landfills). In the interim, the existing regulations in large measure leave to the Agency considerable flexibility as to how they should be implemented or enforced, regardless of whether the site requires a permit or not.

Given this situation, we ourselves do not quite understand why the industries have not moved more quickly. We also again note that it is not clear in the record what number of new landfills, if any, are anticipated in the near future (the utilities appear to be anticipating two). (See second First Notice Opinion, p. 40). We also agree with WMI that the record gives little enlightenment as to whether the landfill operators are running out of space.

This has been a close call for the Board. On reconsideration, we have determined that the best course of action is to grant only a one year "stay". This will serve to put the proceedings on a much shorter timetable and will also provide the incentive to the industries to have their data ready and submit their proposals as soon as possible. We also note that some clarifying language has been included in Section 811.101(b). Also, we will continue to include off-site as well as on-site landfills in the "stay". We fail to see, and the participants have not explained environmentally or otherwise, why they want to exclude off-site landfills both from the "stay" and from any December proposals they might submit. Our decision to grant the "stay" admittedly rests on the expectation that the industries will appreciate, on balance, the advantages to them of not installing new landfills during the "stay" period unless lack of air space is a critical factor, and even then will consider whether it might be more prudent to comply with these new regulations rather than the old ones, or at least seek a permit.

Finally, WMI also asked for clarification as to how onsite landfills, those operating outside the permit system, are to proceed if they wish to use alternatives to basic Board standards or when approval by the Agency is required if an alternative is to be used. This question relates to more than the "stay"

issue. For example, Agency approval is required for use of alternate daily cover materials, and there any any number of instances in these rules, such as where performance standards and assessment and remedial action plans are involved, where onsite operators arguably carry a greater risk of a subsequent enforcement action for decisions made by them, outside a permit setting, as to what constitutes compliance with the rules. This is a legal as well as a practical problem that is not new, except insofar as the problem will be larger with the new regulations. Answering the question posed ultimately requires knowing what the operator wants to do and looking at the individual rule involved, considering the facts of a particular situation. However, as a general observation, the operator may have a number of options, including seeking an adjusted standard before the Board; voluntarily applying for a permit, so that modifications can be approved; informally consulting with the Agency if the Agency is willing; simply taking the course of action with confidence that the rule allows it, etc. We note that these proposed rules, particularly the reporting requirements, reflect a conclusion by the Board, based on the record, that more needs to be known about the activities of onsite facilities.

Relation to the Groundwater Protection Act

The first First Notice Opinion contains an extensive discussion of the relationship of the landfill regulations and the Groundwater Protection Act. (see pp. 47-52). We note that groundwater standards are being addressed pursuant to that Act in pending Dockets R89-5 and R89-14. We believe that it is important to repeat here the essence of the Board's response to that portion of the discussion which evolved around whether the compliance by landfills with the non-degradation standards as enunciated in these landfill regulations would somehow be at odds with the regulations adopted pursuant to the provisions of the Groundwater Protection Act. We still see no reason why that Act would inherently make the landfill regulations not compatible. We again repeat that "the Groundwater Protection Act does not explicitly require the Board to adopt any specific regulations and does not explicitly forbid the Board from adopting any regulations. In fact, that Act explicitly provides that it is not intended to preclude the Board from exercising its general authority to adopt regulations pursuant to Title VII of the Environmental Protection Act." (pp. 51, 52).

Groundwater Modeling

Waste Management, in particular, has challenged throughout this proceeding the availability and use of modeling, particularly as proposed by the Board for compliance and remedial action purposes. WMI has generally asserted that, given the state of development of modeling for this purpose, it is not

possible to use modeling for the purpose of showing no increase above background. (See e.g. P.C. #23, p. 13).

While the Board has addressed this issue before, most recently in its second First Notice Opinion, we will again address it here.

The STS background report (Ex. 1, pp. 59-69) contains a detailed discussion of the issues relating to groundwater impact assessment and the use of groundwater contaminant transport (GCT) models. The report also discusses and addresses the questions raised by commentors regarding the use of GCT models by identifying the purposes and advantages that such tools provide in assessing the potential for contamination at a landfill site, and that modeling is a necessary and appropriate component of the proposed solid waste landfill regulations. The technical support for this position was primarily provided by Dr. Aaron Jennings, who testified in the earlier hearing in the R84-17A docket on June 13, 1986, participated in several other hearings in 1987 in the R84-17D docket and provided comments which are included in the STS Response to Comments document (Ex. 26).

During the 1986 hearings, Dr. Jennings presented a detailed review of the fundamentals of groundwater flow and contaminant transport modeling and answered questions relating to his testimony. The Board in its first First Notice Opinion of February 25, 1988 in R88-7 stated that it was not persuaded by comments theretofore filed that the use of GCT models is inappropriate, but that further comments would be entertained. Waste Management Inc. in its P.C. #23 continued to argue against the use of GCT models and questioned the appropriateness of its use. Responses to these comments were provided by the STS in Ex. 26, pp. 127-135 and pp. 193. The Board also notes that the Illinois Department of Energy and Natural Resources in P.C. #22 provided several examples of cases and studies where groundwater flow and contaminant transport modeling have been successfully used. This information was provided at the request of WMI during the questioning of Ms. Uhlman at the November 27, 1989 EcIS hearing. Ms. Uhlman included the following statement:

> "Briefly, these references should establish that groundwater modeling has been a successful tool in predicting ground water advective and diffusive transport. These models have been applied to complicated geologic scenarios and have, in many instances, been successfully calibrated and verified. A skilled hydrogeologist should be able to make acceptable predictions using these readily available computer codes. Adjusting landfill facility design in response to modeled expected and worst-case scenarios

> will reduce the need for assessment monitoring and the potential for facility failure."
> (P.C. #22, pp. 2)

Some further comments provided by Dr. Jennings after reviewing the February 25, 1988 First Notice language and public comments stated as follows:

> "Since the board has offered to entertain further comment on the concern that contaminant transport modeling is inappropriate as proposed, I will offer the following. Most of the criticisms I have heard are thoroughly flawed. The proposed modeling requires that designers be able to anticipate the most serious environmental problems of landfills. I see no credible justification for bypassing this requirement."
>
> "It is true that there are poor models and poor applications of good models. Obviously, I would not advocate the use of poor models, or the application of models by people not sufficiently competent to use them properly. However, I feel the safeguards built into the proposal (specifically the requirements for model documentation, field calibration, and results sensitivity analysis) are sufficient to guard against gross misuse."
>
> "It is also true that the transport problems can be complex. However, if the proposed operations are too complex for competent professionals to anticipate with the best available scientific models (i.e. by engineering analysis), then they are too unpredictable to be allowed. 'Too complicated to understand' is a very poor justification for proceeding without understanding."
>
> "Finally, on several occasions I heard the claim that one could not know what the leachates would be like until the facility was in place, and without this source strength information, the modeling could not be successful. This argument is also self-defeating. It is true that source quantification may be difficult. It may require the synthesis of as much information as possible about the proposed source plus the judicious use of estimation, extrapolation, assumption and judgment. However, unless one

> can make a reasonable assessment about the magnitude of the most serious environmental problems, how could the facility be allowed at all? The argument of unknown source strength also implies that one cannot guarantee essentials like liner compatibility. If you don't know what will be generated, you certainly can't know that the liner materials will be compatible. Fortunately, I haven't yet heard this as a reason to do away with chemical compatibility analysis."
>
> (Ex. 26, pp. 194-195)

At the June 29, 1989 hearings, Mr. Bruce Hensel of the Illinois Geological Survey presented the results of a study carried out, at the behest of the STS, on the potential for groundwater contamination resulting from land burial of municipal wastes for several mapped hydrogeologic scenarios common in Illinois and to determine the appropriateness of the compliance distance of "100 feet in 100 years." Mr. Hensel, a hydrogeologist, cautioned that use of the model results described in the ISGS study are necessarily generalized for development of regulations and policies and could not be applied to specific sites. He, however, noted that the use of models in the Board's proposal for use in the design and enforcement stages of a landfill must use "extensive and rigorously collected site-specific data". (R. 246). Where a worst case scenario is modeled, the actual values measured would remain lower than the model predicted values. (R. 249, 269, 270). By worst case scenario, Mr. Hensel did not mean plugging in unrealistic numbers; rather he meant that the numbers should be reasonable. A skilled modeler who knows geological uncertainties, will take weak data regarding, for example, dispersion and effective porosity, and err on the more conservative side of the range of values. (R. 282, 283, 286, 287). He also stated that a model such as DRASTIC (proposed for use in the WMI R84-17C proceeding) is also too generalized to be used in a site-specific setting.

It was noted by Mr. DiMambro, during the June 1989 hearings, that it is wrong to characterize the Board's proposal as being dependent on modeling to meet the design criteria. The design and performance criteria have been established and the model in the first instance is used to demonstrate that the proposed design will not allow the applicable Board standard or background concentration to be exceeded in 100 years at 100 feet from the waste boundary. He also stated that it is an unrealistic scenario to believe that after the landfill is sited, the model would throw out the siting and design simply because of the model selected or the choice of an input parameter. (R. 259-262).

The Response to Additional Comments (Ex. 33) filed by the STS contains further clarification on the use and support in the

record for GCT models. STS states the following with regard to WMI's P.C. #38:

> WMI is incorrect in believing that modeling is 'used to set a groundwater regulatory standard.' Groundwater modeling is a tool that can be used for designing landfills to meet the groundwater quality standards outside the zone of attenuation (i.e., "100 feet in 100 years" standard). The model also serves to predict concentrations of contaminants as a function of distance and time. Increases measured above a predicted concentration can provide an early warning trigger for potential increases above a groundwater standard at or outside the compliance boundary.
>
> (Ex. 33, pp. 38)

Based on the record before it, the Board again affirms that the continuing arguments against the use of GCT models in its proposed regulations are not persuasive; there is very little technical support for that position. Instead, there is overwhelming support and information which establishes that GCT modeling has been used previously and can be implemented in carrying out groundwater impact assessments, used for purposes of establishing a groundwater monitoring network and can be used to ensure compliance with the groundwater quality standards applicable to a specific landfill facility. The Board, therefore, continues to believe that the record supports the inclusion of GCT models in these regulations and considers their application to be both necessary and appropriate.

Part 811.Subpart D Additional Standards for Management of Special Wastes at Landfills

We note that, since these landfill regulations were first proposed in 1988, the Board has proposed, and adopted on August 10, 1989 the regulations in Docket R89-13(A), In the Matter of: IDENR Special Waste Categorization Study. The Board has revised Subpart D in these landfill regulations so as to be consistent with the R89-13(A) regulations. We particularly note the changes regarding manifesting and reporting.

Financial Assurance

We again remind those who desire to revisit the financial assurance regulations that the Board is prepared to open a separate Docket upon receipt of any formal proposals or, alternatively, to first consider a request by way of an inquiry hearing. This instant proceeding clearly indicated that the Board's existing regulations need to be generally revisited. However, as earlier stated, in the Second Notice Opinion, the

Board believes it advisable not to itself open a new Docket for wto reasons: first, based on its earlier experience in R84-22, where a Docket D was opened for amending proposals, but none were forthcoming; and second, the record in this proceeding understandably does not contain sufficient detail about the problems based on the anticipation that only problems related to R88-7 would be dealt with in this proceeding.

We will now proceed to the Guide to the Appendices which is intended to assist in locating varies portions of the attached STS Appendices A1, A2, and A3.

GUIDE TO APPENDICES

BOARD'S FINAL OPINION IN R88-7
NONHAZARDOUS WASTE LANDFILL REGULATIONS

The appendices to the August 17, 1990 Final Opinion in R88-7 contains the following three documents prepared by the Scientific/ Technical Section (STS) of the Board to provide the technical support and rationale for the non-hazardous solid waste landfill rules:

1. **Appendix A-1:**

   Recommendations For A Nonhazardous Waste Disposal Program In Illinois And A Background Report To Accompany Proposed Regulations For Solid Waste Disposal Facilities, March 7, 1988 (Exhibit 1, R88-7)

   A Section-by-Section analysis of an STS proposal for regulating nonhazardous waste landfills was submitted in parts to the Board on May 22, May 26, June 12, and June 21, 1987. The Board Orders of May 28 and June 22, 1987 established the R84-17D docket to consider the STS proposal. STS filed revised versions of various portions of its proposed rules and background report on January 15, February 4 and 18, 1988. The Board First Notice Opinion and Order (February 25, 1988) opened Docket R88-7 to propose rules largely based on the information presented in this document, filed March 7, 1988, and the STS's proposal considered in R84-17D.

2. **Appendix A-2:**

   Response to Comments on Proposed Parts 807 through 815, March 1, 1990 (Exhibit 26, R88-7)

   This document contains the recommendations provided by the STS in response to public comments received during the First Notice comment period. The second First Notice (March 1, 1990) language reflects the changes made by the Board to address the public comments. Most of the changes were based on the STS's recommendations presented in this document.

3. **Appendix A-3:**

   Response to Additional Comments On Proposed Parts 807, And 810 Through 815, June 7, 1990 (Exhibit 33, R88-7)

   STS's recommendations to the Board in response to public comments received during the second First Notice comment

period are contained in this document. The Second Notice language (June 7, 1990) contains the changes made by the Board based on the STS's recommendations in this document.

STS notes that issues relating to changes made by the Board, which are either not addressed or are different from the recommendations in the above documents are discussed in the Board Opinions filed at First Notice (February 25, 1988), second First Notice (March 1, 1990) and Second Notice (June 7, 1990).

The attached Appendix Guide Table provides a listing of the final rules by Section numbers and references the page number(s) in each of the above three documents addressing that particular Section. The Background Report (A-1) provides technical support for a particular Section and the other two documents (A-2 and A-3) provide responses to public comments and the rationale for any changes recommended by the STS to that section.

APPENDIX GUIDE TABLE

Section No.	Page Numbers of Documents in Appendices: A-1	A-2	A-3	Remarks
		PART 807		
		SOLID WASTE		
		SUBPART A: GENERAL PROVISIONS		
807.105		4	2	NA
		PART 810		
		SOLID WASTE DISPOSAL: GENERAL PROVISIONS		
810.101	13	-	-	J
810.102	13	-	-	J
810.103	13	4-34	2-4	J
810.104		-	-	J,NA
		PART 811		
		STANDARDS FOR NEW SOLID WASTE LANDFILLS		
		SUBPART A: GENERAL STANDARDS FOR ALL LANDFILLS		
811.101	16	37	-	
811.102	16	-	-	J
811.103	17	42,43	-	J
811.104	19	44	-	
811.105	19	44,45	4,5	
811.106	19	-	-	
811.107	20	48,49,51	-	J
811.108	21	53	5	
811.109	21	53,54	-	
811.110	22	56	-	
811.111	22	57,58	5	
		SUBPART B: INERT WASTE LANDFILLS		
811.201	23	-	-	
811.202	25	61	7	
811.203	26	65	-	
811.204	26	65	-	J
811.205	27	66	-	J
811.206		-	7	J,NA
811.207		-	8	NA
		SUBPART C: PUTRESCIBLE AND CHEMICAL WASTE LANDFILLS		
811.301	27	-	-	
811.302	27	69	-	

APPENDIX GUIDE TABLE (Contd.)

Section No.	Page Numbers of Documents in Appendices: A-1	A-2	A-3	Remarks
811.303	29	71	-	
811.304	30	-	-	J
811.305	30	-	-	
811.306	32	78,79	10	J
811.307	38	80,81	-	
811.308	39	82	-	
811.309	41	83-89	11,12	J
811.310	45	92-96	12,13	J
811.311	48	97,98,100-102	13	J
811.312	53	106,107	14	
811.313	54	108	-	
811.314	55	110,112	-	
811.315	57	115-120,122,124	15-17	J
811.316	58	127	-	
811.317	59	127-132	17,18	
811.318	69	135-143	18	J
811.319	75	145-155	19-25	J
811.320	77	161,164-168	26-29	J
811.321	92	168,169	30	
811.322	92	-	-	
811.323		170	30	J,NA
SUBPART D: MANAGEMENT OF SPECIAL WASTES AT LANDFILLS				
811.401	93	173	-	
811.402	93	173-174	-	
811.403	93	174-177	-	
811.404	93	178	-	J
811.405	94	-	-	
811.406		180	-	NA
SUBPART E: CONSTRUCTION QUALITY ASSURANCE PROGRAMS*				
811.501	94	-	-	
811.502	94	184,185	-	
811.503	95	186	30	
811.504	95	-	31	
811.505	95	187	31	
811.506	95	-	31	
811.507	95	189,190	32	
811.508		-	-	J,NA

APPENDIX GUIDE TABLE (Contd.)

Section No.	Page Numbers of Documents in Appendices: A-1	A-2	A-3	Remarks
811.509		-	-	J,NA
	SUBPART G: FINANCIAL ASSURANCE			
811.700	96	197	32	
811.701	97	197	-	
811.702		197	-	NA
811.703		198,199	-	NA
811.704	97	200-202	33	
811.705	98	-	33	
811.706		-	-	NA
811.707		-	-	NA
811.708		202	-	J,NA
811.709		-	-	NA
811.710		203-206	-	NA
811.711		207-208	-	NA
811.712		209	-	NA
811.713		209	-	NA
811.714		-	-	J,NA
811.715		214,215	-	J,NA
	PART 812			
	INFORMATION TO BE SUBMITTED IN A PERMIT APPLICATION			
	SUBPART A: GENERAL INFORMATION REQUIRED FOR ALL LANDFILLS			
812.101	98	218	-	
812.102	98	-	-	
812.103	98	-	-	
812.104	98	219	-	
812.105	98	-	-	
812.106	98	220,221	-	
812.107	98	221,222	-	
812.108	98	223	-	J
812.109	98	-	-	
812.110	98	224,225	-	J
812.111	98	-	-	
812.112	98	225	-	
812.113	98	226	-	
812.114	98	227	-	
812.115	98	-	-	
812.116	98	-	-	

APPENDIX GUIDE TABLE (Contd.)

Section No.	Page Numbers of Documents in Appendices: A-1	A-2	A-3	Remarks
SUBPART B: ADDITIONAL INFORMATION REQUIRED FOR INERT WASTE LANDFILLS				
812.201	98	-	-	
812.202	98	-	-	
812.203	98	-	-	
812.204	98	-	-	
SUBPART C: ADDITIONAL INFORMATION REQUIRED FOR PUTRESCIBLE AND CHEMICAL WASTE LANDFILLS				
812.301	98	227	-	
812.302	98	-	-	J
812.303	98	228,229	-	
812.304	98	229	-	
812.305	98	-	-	J
812.306	98	-	-	
812.307	98	-	-	
812.308	98	229	-	J
812.309	98	-	33	
812.310	98	-	-	
812.311	98	231	-	
812.312	98	-	-	
812.313	98	-	-	
812.314	98	-	-	
812.315	98	-	-	
812.316	98	-	-	J
812.317	98	232	-	J
812.318	98	-	-	J
PART 813 PROCEDURAL REQUIREMENTS FOR PERMITTED LANDFILLS SUBPART A: GENERAL PROCEDURES				
813.101	99	-	-	J
813.102	99	-	-	
813.103	100	233	-	
813.104	100	-	-	
813.105	100	-	-	
813.106		-	-	NA
813.107	101	-	-	
813.108	101	-	-	
813.109	101	236	-	J

APPENDIX GUIDE TABLE (Contd.)

Section No.	Page Numbers of Documents in Appendices: A-1	A-2	A-3	Remarks
813.110	102	238,239	34	J
813.111	103	240	34	J
SUBPART B: ADDITIONAL PROCEDURES FOR MODIFICATION AND SIGNIFICANT MODIFICATION OF PERMITS				
813.201	104	241	35	J
813.202	104	-	-	
813.203	104	242	-	
813.204	104	-	-	
SUBPART C: ADDITIONAL PROCEDURES FOR THE RENEWAL OF PERMITS				
813.301	105	-	-	
813.302	105	-	-	
813.303	105	-	-	
813.304	105	244	-	
813.305	105	-	-	
SUBPART D: ADDITIONAL PROCEDURES FOR INITIATION AND TERMINATION OF TEMPORARY AND PERMANENT CLOSURE AND POSTCLOSURE CARE				
813.401	105	-	-	J
813.402	105	-	-	
813.403	105	244	-	
SUBPART E: REPORTS TO BE FILED WITH THE AGENCY				
813.501	106	245	35	J
813.502	106	246	-	
813.503	106	-	35,36	
PART 814 STANDARDS FOR EXISTING LANDFILLS AND UNITS SUBPART A: GENERAL REQUIREMENTS				
814.101	106	249	-	J
814.102	107	-	-	
814.103	107	250	-	
814.104	107	-	-	
814.105		-	-	NA
814.106		-	-	NA
SUBPART B: STANDARDS FOR UNITS ACCEPTING INERT WASTE				
814.201		251	-	NA

APPENDIX GUIDE TABLE (Contd.)

Section No.	Page Numbers of Documents in Appendices: A-1	A-2	A-3	Remarks
814.202		251	-	
SUBPART C: STANDARDS FOR EXISTING UNITS ACCEPTING CHEMICAL AND PUTRESCIBLE WASTES THAT MAY REMAIN OPEN FOR MORE THAN SEVEN YEARS				
814.301	107	251	-	
814.302	108	251,252	-	J
SUBPART D: STANDARDS FOR EXISTING UNITS ACCEPTING CHEMICAL AND PUTRESCIBLE WASTES THAT MUST INITIATE CLOSURE WITHIN SEVEN YEARS				
814.401	110	253	-	
814.402	110	253-255	-	J
SUBPART E: STANDARDS FOR EXISTING UNITS ACCEPTING INERT WASTE ONLY, OR ACCEPTING CHEMICAL AND PUTRESCIBLE WASTES THAT MUST INITIATE CLOSURE WITHIN TWO YEARS				
814.501	110	-	-	
814.502		-	-	NA
PART 815				
PROCEDURAL REQUIREMENTS FOR ALL LANDFILLS EXEMPT FROM PERMITS				
SUBPART A: GENERAL REQUIREMENTS				
815.101	111	257	-	J
815.102	112	-	-	
SUBPART B: INITIAL FACILITY REPORT				
815.201	112	257	-	
815.202	112	-	-	
815.203	112	-	-	
815.204		-	-	NA
SUBPART C: ANNUAL REPORTS				
815.301	112	257	-	
815.302	113	-	-	
815.303	113	257	36	J
SUBPART D: QUARTERLY GROUNDWATER REPORTS				
815.401	113	257	-	
815.402	113	258	-	

APPENDIX GUIDE TABLE (Contd.)

Section No.	Page Numbers of Documents in Appendices: A-1	A-2	A-3	Remarks
	SUBPART E: INFORMATION TO BE RETAINED ONSITE			
815.501	113	258	-	
815.502	113	-	-	J
815.503	113	-	-	

Symbols

- STS has not recommended any changes to these sections.

NA Background Report (A-1) does not address or discuss these sections.

J The Board has made changes in these sections in response to comments received from the Joint Committee on Administrative Rules (JCAR). The Final Notice language (Aug. 17, 1990) reflect these changes.

* Note that the Subpart E requirements at Section 811.501 through Section 811.507 are discussed in Appendix A-1 under Sections 811.601 through Section 811.607.

J. Dumelle and B. Forcade concurred.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion was adopted on the 17th day of August, 1990, by a vote of 6-0.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board