ILLINOIS POLLUTION CONTROL BOARD
April 30, 1987

IN THE MATTER OF:	)	
	)	
PROPOSED AMENDMENTS TO	)	R84-29
TITLE 35, SUBTITLE D: MINE	)	
RELATED WATER POLLUTION,	)	
CHAPTER I, PART 406	)	

PROPOSED RULE. SECOND NOTICE.

OPINION AND ORDER OF THE BOARD (by R.C. Flemal):

On July 11, 1986, the Board proposed for first notice publication amendments to certain portions of 35 Ill. Adm. Code 402 and 406. The proposed amendments were published at 10 Ill. Reg. 12827, August 1, 1986. These proposed amendments largely parallel the substance of the proposal put forth in this matter by the Illinois Coal Association ("ICA"). Two comments were received during the first notice period: one from the ICA on September 12, 1986, and the other from the Illinois Environmental Protection Agency ("Agency") on September 15, 1986.

The two comments received during the first notice period raised several questions concerning the proposed amendments, and reflect the widely divergent perspectives on this matter which have been espoused by the two major participants to this rulemaking, the ICA and the Agency. Probably the most significant of these differences focused on the annual increase in sediment loading to Illinois waterways projected to result from adoption of the 0.5 ml/l settleable solids ("SS") standard, and the environmental impact of that additional runoff. Adoption of the SS standard, which has been the focus of the ICA proposal throughout this docket, was proposed by the Board along with certain other amendments in its July 11, 1986, Opinion and Order. The Agency has repeatedly indicated its belief that the ICA, and the EcIS prepared in this matter, underestimate the adverse environmental impact that would result from adoption of the SS standard.

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* The Board wishes to thank Mr. Richard DiMambro of the Board's Scientific and Technical Section for his continued guidance and assistance in this matter.

In response to the conflicting nature of the comments received during first notice, the Board determined that an additional hearing would be necessary in order that certain aspects of the record might be expanded upon. More specifically, the Board stated by Interim Order of October 9, 1986, that this might be accomplished if certain matters were addressed at hearing, including:

1. A presentation of the results derived from the Agency's experimentation with the Sedimot II computer model (as described in paragraph four of the Agency's first notice comments).

2. Receipt of additional comments on 35 Ill. Adm. Code 406.102(i), as proposed by the Board in its First Notice Opinion and Order.

3. A clarification by the Agency of why it believes the Board's proposal is more stringent, in some regards, than the Federal limitations (the Agency espoused this position in paragraph three of its first notice comments).

4. A clarification by the Agency of the assertions made in paragraph two of its comments.

5. Additional testimony of Mrs. Linda Huff, President, Huff & Huff, Inc. (the contractor which produced the Economic Impact Assessment ("EcIS") for this proceeding), particularly in regard to her perspectives on the Agency's projections derived through the use of the Sedimot II model, and any additional comment she may have regarding the predicted economic ramifications of Alternative "B" of the Agency's March 15, 1985, proposal.

6. Additional testimony addressing the environmental effects of settleable solids.

The additional hearing was held on December 10, 1986, in ringfield, Illinois. Post-hearing comments were filed by the partment of Energy and Natural Resources on December 22, 1986, d the Agency on February 3, 1987.

BACKGROUND

This proceeding was initiated by a May 31, 1984, proposal .ed by the ICA. That proposal was later revised on February 1985. The ICA proposal requests that the Board amend 35 Ill. i. Code 406.106 by deleting the current provision relating to e discharges during rainfall events, and substituting it with ndards patterned after the federal regulations governing such

discharges. Under the provisions of the ICA proposal, mine discharges would be exempted from the requirements of §406.106(b) (except pH) during rainfall events, but a 0.5 ml/l settleable solids limitation would be imposed on any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume). The 0.5 ml/l SS standard is the current federal standard [1].

The impetus for the ICA proposal, inter alia, is that it would allow mine operators in Illinois to utilize more economic sediment ponds. Since the United States Environmental Protection Agency promulgated the SS standard, all of the midwestern states other than Illinois have adopted it (EcIS at vi). The increased costs to Illinois mine operators incurred as a result of having to continue to build 10-year, 24-hour ponds places them at a competitive disadvantage with operators from surrounding states (EcIS at 99).

Merit hearings were held on the ICA proposal in Urbana, Illinois, on November 30, 1984, and in Springfield, Illinois, on December 21, 1984.

The Agency submitted an alternative regulatory proposal in this docket on March 15, 1985. The Agency subsequently amended its proposal on March 20 and 21, 1986. The Agency proposal would eliminate the total suspended solids monitoring requirement for mine discharges and instead provide two design criteria alternatives for treatment of alkaline surface drainage. The alternatives are: design and construction of 24-hour detention ponds for runoff from the 10-year, 24-hour storm event (known as Alternative "A"); or design and construction of sediment ponds capable of removing 80% of the sediment from the 10-year, 24-hour storm event (known as Alternative "B").

The economic impact analysis ("EcIS") prepared for this proceeding, "Economic Impact Analysis of R84-29: Mine Related Water Pollution Regulations", was received by the Board on February 3, 1936. Hearings on the EcIS were conducted in DeKalb, Illinois, on March 10, 1986, and in Springfield, Illinois, on March 18, 1986.

Detailed discussions of current Illinois and Federal law applicable to mine discharge effluents, as well as analyses of the ICA and Agency proposals in this matter, are contained in the

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[1] The current effluent limitations guidelines for the coal mining point source category were promulgated on October 9, 1985 and are found at 50 Fed. Reg. 41,296 (1985) (to be codified at 40 C.F.R. Part 434).

Board's July 11, 1986, Opinion and therefore will not be repeated here.

TODAY'S ACTION

After consideration of the first notice comments, the testimony presented at the December 10, 1986 hearing, and the post-hearing comments received, the Board remains persuaded of the merits of the SS standard. The Board therefore now proposes for second notice, with slight modification, the amendments to Parts 402 and 406 which were published for first notice on August 1, 1986.

The degree of variance in the viewpoints presented to the Board in this proceeding has made the Board's task particularly difficult in this instance. Due to the discordance of the record, the Board provides the following discussion in support of the position it takes today.

ENVIRONMENTAL IMPACT

As noted above, the questions of the potential increase in sediment loading resulting from adoption of the SS standard, and the environmental impact of the additional sediment loss brought about as a result, have been strenuously debated throughout the record in this matter. To assist the Board in arriving at well-reasoned decisions on these and other questions relevant to this proceeding, the Board contracted with Dr. Billy Barfield, Professor of Agricultural Engineering at the University of Kentucky, to appear on the Board's behalf as an expert witness at the December 10, 1986, hearing. Dr. Barfield is an acknowledged expert in the area of sedimentation pond design and reservoir modeling. He is the chief author of the Sedimot II computer model, a well-known model that can be used to predict sediment pond performance. In fact, the United States Office of Surface Mining has stated in the Federal Register that the model is the preferred method of predicting sediment pond performance, (Board Exhibit 2(b)). Both the ICA and the Agency utilized Sedimot II in modeling the impacts they would expect to occur from adoption of the SS standard.

Increased Sediment Loading, as Calculated by Participants

The EcIS prepared for this proceeding predicted that adoption of the SS standard would result in an additional loading after a 2-year, 24-hour storm of 96 mg/l from a hypothetical pond designed to meet the SS standard. This equates to an increase in the annual statewide loading of 3,400 tons (EcIS at 58). In

calculating this figure, the authors of the EcIS assumed that ponds designed to meet the SS standard would achieve a trapping efficiency[2] of 90%, and that they would be 50 to 60% smaller than those currently constructed to contain runoff from 10-year, 24-hour storm events (EcIS at 54). At the December 10, 1986, hearing, Mrs. Linda Huff, the primary author of the EcIS, revised this figure in light of calculations made by the Agency through the use of Sedimot II[3]. At that time Mrs. Huff stated that she felt the incremental statewide loading would be somewhere between 3,400 and 17,000 tons per year (R.[4] at 333).

The Agency presented calculations within the context of its first notice comment showing that adoption of the SS standard would increase sediment loading statewide by 7,400 tons per year[5]. The ICA presented its own calculations through the testimony of Jim Buck of Amax Coal Company. Mr. Buck estimates that adoption of the SS standard would increase sediment loading statewide by 1,440 tons annually (R. at 305; ICA Exhibit X).

Increased Sediment Loading,
as Calculated by Board

It is agreed by all participants that the adoption of the new regulations would cause an increase in the amount of sediment

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[2] The "trapping efficiency" of a sedimentation pond is the percentage of sediment particles flowing into the pond which settle or are retained in the pond, and do not flow out in the discharge from the pond.

[3] These calculations are found in the Agency's September 5, 1986 first notice comment.

[4] Unless otherwise noted, citations to the record will refer to the transcript of the December 10, 1986, hearing.

[5] The Agency calculated that adoption of the SS standard would increase pond discharge by .74 tons per acre following a 2-year 24-hour storm event. Multiplying this figure by 5,000 acres, which is the figure assumed by the participants to fairly represent the annual acreage disturbed by mining operations, the Agency concluded that 3,700 additional tons would be discharged following a storm event of the 2-year 24-hour magnitude. Dr. Barfield indicated at hearing that twice the discharge resulting from a 2-year 24-hour storm event for a given watershed is approximately equal to the annual discharge from that watershed (R. at 305). Therefore, accepting that assumption, the Agency predicts an annual increased sediment loading of two times 3,700 tons, or 7,400 tons.

released from coal mine sedimentation ponds. This agreement stems from an agreed assumption that new ponds would be sized smaller, and therefore that the trapping efficiency of the new ponds would be somewhat less than the trapping efficiency of ponds constructed under the existing regulations.

A difficulty arises in attempting to evaluate the incremental increase in sediment loadings which would be occasioned by the new regulations. As shown, numerous estimates have been presented in the record of this proceeding. All such estimates are based on reasonable authority, but are nonetheless disparate due principally to differring assumptions as well as some apparent miscalculations. Accordingly, the Board believes that the best perspective is gained by initially reviewing the basic calculations by which the incremental loadings may be estimated.

The basic relationship is that a given quantity of water with a given concentration of sediment contains a specific volume of sediment. In terms of the issue at hand, this can be restated in the form: a given quality of runoff from a sedimentation pond which has a given concentration of sediment contains a specific sediment load or yield. Convenient units in which to cast this relationship are acre-inch per year for runoff, mg/l for sediment concentration, and pounds per acre per year for sediment yield. Given these units, a runoff of one acre-inch per year which has a concentration of 1 mg/l will produce a sediment yield of .2266 lbs/acre/yr.

The next step is to consider the average annual runoff, measured in inches, which is typical of the coal mined areas of Illinois. Average annual runoff varies as a function of both climate, including annual precipitation, and local conditions of topography, vegetation, etc. Thus, average annual runoff would be most appropriately determined with site-specific data, since the runoff from mined areas may not be the same as runoff from areas where land use is different. However, absent such data, the best approximations available are the average runoff data collected by the U.S. Geological Survey in the principal coal mining areas of the State. Annual runoff in the Big Muddy Basin, as measured at Murphysboro, averaged 11.23 inch/yr year prior to the construction of Rend Lake, and has averaged 12.20 inch/yr subsequent to the construction of the lake. Annual runoff in the basin of the South Fork of the Saline River, as measured at Carrier Mills, has averaged 14.97 inch/yr. These two stations are generally typical of the coal mining region of southern Illinois. The La Moine River, as measured at Colmar, and which has had an average annual runoff of 9.45 inch/yr, probably provides a more realistic estimate for runoff in the coal mining areas of western Illinois. Given these data, it is reasonable to assume a value of approximately 13.0 inches per year for runoff in the southern part of the State, and approximately 10.0 inches per year in the western part of the State.

The second step is to estimate the average sediment concentration in that runoff which passes through sediment ponds. This is the most difficult of the estimates to make, partially because the paucity of data and partially because sediment concentrations experience such wide extremes that a very large data set is necessary to calculate a meaningful average. An additional compounding factor associated with the large variability exhibited by sediment concentration data is that high concentrations tend to coincide with large discharges. Thus, high percentages of the total load are transported during just that small fraction of the time which corresponds to high discharges, and also concentrations averaged over the full spectrum of discharge events are not likely to be representative of the average "effective" concentration. For these reasons, it is most appropriate to consider the average concentration as that concentration which typifies a fairly high discharge event. During the course of this proceeding, the discharge event which has been so considered has been the runoff event produced by the 2-year rainfall, which is the maximum rainfall event to be expected in any two-year period. This event is not entirely arbitrarily chosen, but rather has some standing in the field of sediment studies as the event most commonly used by authorities. The Board will accordingly use this event in the following analysis, and subsequent use of "average concentration" will be assumed to be synonomous with the average sediment concentration being discharged from a sedimentation pond after a runoff event occasioned by a 2-year rainfall. It is further instructive to note that on the average the 2-year rainfall tends to carry approximately one-half of the average annual runoff (see footnote 5). Thus, based on the figures cited above, the 2-year rainfall would produce a runoff event of approximately 6.5 inches in the southern part of the State and 5.0 inches in the western part of the State.

Three different estimates of average sediment concentration from ponds are of interest. These are the average concentrations under the present regulations, sediment concentrations which could be expected assuming adoption of the proposed regulations, and the increment of concentration change which would be expected were the regulations to be adopted. The latter, which is equivalent to the difference between the two other average concentrations, is of principal interest because from this figure the incremental loading associated with adoption of the proposed regulations can be calculated.

Unfortunately, there are poor or conflicting data regarding both present average concentrations and average concentrations under the proposed regulations. It is therefore necessary to consider possible ranges of values. Considering first the average concentrations from ponds under the present regulations, the EcIS cites the figure of 96 mg/l. This is generally at the low end of estimates that have been provided in the record, but

is consistent with the figures most commonly cited by members of the Coal Association (see, for example, R. at 340, 342). Dr. Barfield indirectly provided an estimate which lies at the high end of the range. Barfield estimated that effluent concentrations from a pond which had a 90% trapping efficiency, or from which 10% of the sediment would escape, would be about 5000 mg/l. Since it is generally agreed that ponds designed according to the present regulations have a trapping efficiency of about 95%, which is equivalent to allowing 5% of the sediment to escape, Dr. Barfield's figures implies that present pond effluent concentrations would be approximately one-half of 5000 mg/l, or 2500 mg/l (i.e., an equivalent amount of water would discharge, but the water would contain only half as much sediment).

Both the EcIS and the Barfield estimates are open to some question. The EcIS estimate was criticized as having been based on data collected during periods of only fairly low discharges (R. at 335-336), and thus as not being representative of the higher concentrations typical of high pond discharges. Conversely, the Barfield data is based principally on Dr. Barfield's experience and actual field measurements made in the Appalachian coal province, which is characterized by substantially greater relief, and hence also likely greater runoff and erosion, than typifies the coal mining areas of Illinois. There is further question regarding the Barfield data concerning whether the Barfield ponds were constructed in a fashion comparable to ponds constructed under Illinois' present regulations. In spite of these questions, these two estimates serve as useful likely extremes with which to define the possible range of average sediment concentrations from ponds constructed according to present Illinois regulations.

Given the range of average concentrations for existing ponds, as presented in the two preceeding paragraphs, it is relatively straightforward to estimate the average concentration to be expected from ponds constructed according to the proposed regulations. This simplicity stems from the accepted relationship, as previously noted, that the proposed regulations would result in a trapping efficiency decrease from 95% to 90%. Since, as also previously noted, the same amount of discharge occurs in either case, it follows that the average concentrations under the proposed regulations would be twice the average concentrations which exist under the present regulations. Using the EcIS estimate this would be 192 mg/l, and using the Barfield estimate this would be 5000 mg/l.

The range of incremental increase in average concentrations which would be allowed from ponds constructed according to the proposed regulations is then the difference between the two sets, or 96 mg/l for the EcIS data and 2500 mg/l for the Barfield data.

All the data necessary for utilizing the beginning runoff/concentration/yield relationship are now assembled, and the basic question of what would be the incremental increase in sediment yield given adoption of the proposed regulations may be addressed. The following table shows the expected incremental sediment loading under the various runoff and sediment concentration scenarious:

Average Annual Runoff (in/yr)	Average Incremental Concentration (mg/l)	Incremental Sediment Loading (lbs/acre/yr)
10.0	96	218
13.0	96	283
10.0	2500	5665
13.0	2500	7364

A useful dimension which may be added to this analysis is to consider the incremental sediment loadings in terms of tons per acre per year, which is the conventional unit used in discussion of sediment yields from agricultural lands, construction sites, and other similar areas where sediment yields are of interest. This is accomplished by dividing the right hand column above by 2000 lbs/ton. A second useful dimension which may be added is to consider the total statewide incremental increase in sediment load. This may be accomplished by noting that there are at any given time, approximately 5000 acres of disturbed land in Illinois which are tributary to coal mine sedimention ponds. If it is assumed that all of this acreage were eventually converted to being tributary to ponds constructed under the proposed regulations, the total incremental tonnage would be 5000 times the incremental tonnage calculated according to the procedure outlined at the beginning of this paragraph. The following data are thus produced:

Average Annual Runoff (in/yr)	Average Incremental Concentration (mg/l)	Incremental Sediment Loading (tons/acre/yr)	Statewide Incremental Sediment Loading (tons/yr)
10.0	96	.109	545[6]
13.0	96	.141	707
10.0	2500	2.83	14,162
13.0	2500	3.68	18,411

As the preceding discussion suggests, the most likely situation is likely be between the extremes presented above.

The Board remains convinced that little adverse environmental impact will occur as a result of adopting the SS standard. As illustration, the following worst-case scenario can be developed. The Big Muddy River and Saline River basins receive over two-thirds of the mining discharges in Illinois (EcIS at 65). Taking the highest estimate in the record for statewide incremental sediment loading in tons per year (18,411), and further assuming that all the ponds in the two drainage basins are designed according to the proposed standards, a maximum of approximately 12,500 additional tons might be anticipated to be discharged to those two river basins. The record also indicates that the existing sediment load for the Big Muddy River Basin is on the order of 255,900 tons per year (EcIS at 58). Although the record does not contain a similar estimate of the sediment load of the Saline River, it is reasonable to assume, given the similarity in drainage basin characteristics, that the unit area production of sediment in the Saline Basin is similar to that in the Big Muddy Basin. Therefore, since the Saline and Big Muddy Rivers have drainage areas of 1177 and 2387[7] square miles, respectively, the total existing sediment yield

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[6] The Board realizes that the figure put forward in the EcIS as representing the statewide annual incremental sediment loading in tons per year (assuming all ponds were designed according to the SS standard) is 3,400 tons (EcIS at 58). The Board belives, howver, that that figure is not consistent with the EcIS conclusion that adoption of the SS standard would cause a 96 mg/l increase in the sediment levels discharged from sedimentation ponds following a 2-year 24-hour storm event. By accepting the latter finding of the EcIS, the Board has found it necessary to revise (downward) the 3,400 ton figure (as shown above). The Board believes its revised figures to have been correctly derived and calculated.

[7] Drainage areas are from U.S. Geological Survey Water Resources Investigations 79-110, "River Mileages and Drainage Areas for Illinois Streams".

from the two basins combined would be approximately 382,000 tons per year. The worst case scenario would thus cause a 3.3% increase in the sediment load of the two basins combined.

The Board is confident that this analysis overstates what the actual incremental sediment load would be, since it is predicated on the severest possible assumptions. Conversely, if one were to accept as being more reasonable the EcIS conclusion that the statewide incremental sediment loading would be 3,400 tons per year, the same analysis provides an estimate of only a 0.6% increase in sediment load in the two basins combined. A still lower estimate of 0.1% is arrived at if the statewide incremental loading of 707 tons per year, as previously derived, is assumed.

The Board notes that the above analysis should not be construed as supporting a view that a 3.3% increase in the annual sediment loading of the Saline and Big Muddy Rivers is necessarily insignificant. Rather, the Board presents the discussion only for the purpose of showing that even under the worst possible conditions the projected incremental sediment loading is a small number, and additionally that under more realistic assumptions than provided for by the worst case scenario, the incremental sediment loading would be smaller still.

The Board must also make one other note regarding the potential environmental impact stemming from adoption of the SS standard. The Agency has, admittedly, had concerns throughout this proceeding regarding the increased sedimentation which might occur if the ICA proposal is adopted. These concerns have caused the Agency to vigorously oppose the adoption here of the SS standard. In support of its position, and ostensibly to give the Board more options in this proceeding, the Agency offered a proposal of its own in lieu of the ICA proposal[8]. The Agency proposal would require sedimentation ponds to be designed to: provide 24 hours detention time for flows up to those occurring as a result of a 10-year, 24-hour storm event ("Alternative A"), or provide an alternate detention time as long as it could be shown that the pond will remove at least 80% of the sediment in runoff resulting from a 10-year, 24-hour storm events ("Alternative B"). During the first notice period, the Agency submitted comments which included projections, compiled through the use of Sedimot II, of the performance of several hypothetical sedimentation ponds sized according to the requirements of the SS standard. The Agency had assumed that such ponds would remove

[8] The Agency proposal was described at length at pages 7-9 of the Board's July 11, 1986 first notice Opinion and Order in this matter.

only 20-30% of the inflowing sediment. However, the two SS-sized ponds the Agency asked Sedimot II to evaluate during a theorized 10-year, 24-hour storm event both trapped 82% of the inflowing sediment (Board Exhibit 3, p. 49), and therefore would have satisfied Alternative B of the Agency's proposal. Sedimot II, an analytical tool widely regarded as the most authoritative model of its kind, thus predicts that the increased sediment loading will be significantly less than that feared by the Agency.

ECONOMIC IMPACT

The Board continues to find that the overall economic impact of these proposed regulations is positive. The cost savings to coal operators in Illinois are considerable (see first notice Opinion and Order at 12; also see December 22, 1986, comment of the Department of Energy and Natural Resources), and the increased cost to public water supplies in Illinois, estimated to be in the area of $3,718 to $54,944 (R. at 320-321), is minimal in comparison.

MONITORING DURING PRECIPITATION EVENTS

Adoption of a performance based pond design standard (such as the SS standard) requires that periodic monitoring be done to insure that ponds continue to meet the requisite level of performance. For this reason, the Board proposed for adoption at first notice Section 406.102(i), which reads in full as follows:

> At least one sample shall be collected during the time period the alternate limitations for precipitation events in 406.109 and 406.110 are in effect. The operator shall have the burden of proof that the discharge or increase in discharge was caused by the applicable precipitation event.

The Board intended that Section 406.102(i) would require one sample to be taken from each pond during each precipitation event. The comments received at first notice reflected disagreement with the section.

The ICA contends that it could be "impossible to comply" with Section 406.102(i), as "(m)anpower to sample all of the ponds for each event is neither available, nor realistic" (comments of the Illinois Coal Association Re: R84-29, September 12, 1986). The ICA suggests instead that monitoring be limited to the collection of one quarterly sample from each pond, taken during a precipitation event.

The Agency, on the other hand, feels that the Board's proposed requirement of one sample per pond per precipitation event is "insufficient to effectively judge a pond's performance in actual operation" (comments of the Illinois Environmental Protection Agency, September 15, 1986). The Agency states that "meaningful" sampling requires that "multiple samples (be taken) during the rising leg, at or near the peak and on the falling leg of the hydrograph" (Id.). Alternatively, the Agency suggests that if the Board decides to not require multiple sampling during each precipitation event, then it should specify where on the runoff hydrograph (rising leg, peak, or falling leg) the sample should be collected.

The Board concludes that a middle ground between the ICA and Agency viewpoints has the most merit in this instance. Although Section 406.102(i) as proposed at first notice does reflect a position between those of the ICA and the Agency, the Board believes it necessary to further refine the requirements of the section. The Board is persuaded that a required sampling frequency of one sample per pond per precipitation event may be an onerous burden, particularly in regard to those operators which may have dozens of ponds on a single mining site. Therefore, the Board will require that three samples be taken per pond per quarter, during three separate periods in which the alternate limitations for precipitation events are in effect. Formally, establishment of this requirement will be accomplished by deleting the formerly proposed Section 406.102(i), and amending Section 406.102(d) in the following manner:

> d) At a reasonable frequency to be determined by the Agency, the permittee shall report the actual concentration or level of any parameter identified in the state of NPDES permit. Each report submitted pursuant to this subsection shall include at least three samples taken from each pond discharge during three separate periods occurring during that reporting period in which the alternate limitations for precipitation events of Section 406.109 and 406.110 were in effect. If such alternate limitations are in effect on fewer than three separate occasions during a reporting period, one sample shall be taken of each pond discharge during each occasion in that period when the alternate limitations are in effect. The operator shall have the burden of proof that the discharge or increase in discharge was caused by the applicable precipitation event.

The Board believes that the monitoring requirements as now proposed impose a more reasonable demand on the manpower capabilities of mine operators, yet at the same time will provide a substantial data base from which the performance of sedimentation ponds can be calculated and assessed.

ADDITIONAL DEFINITIONS

The Agency suggested in its first notice comment and at the December 10, 1986 hearing that the Board add and/or amend a number of definitions pertaining to certain terms used in proposed Section 406.110. Most of these terms are presently not defined in Subtitle D. The Board finds that it is appropriate to add definitions for the terms "coal preparation plant", "coal preparation plant associated areas", "controlled surface mine drainage", "mountaintop removal", "steep slope", and "base flow", and to amend the definition of "controlled surface mine drainage". The Board will therefore adopt, with slight modification, the definitions for these terms suggested by the Agency.

The Agency also suggested that definitions be adopted for the terms "1-year, 2-year, and 10-year, 24-hour precipitation events". The Board believes it unnecessary to add definitions for these terms, as their meanings are commonly understood. The Board therefore declines to add definitions for these precipitation events.

Additionally, the Agency commented that given the Board's stated objective of structuring these regulations so as to assure consistency with the federal regulations, certain minor alterations should be made to proposed sections 406.110(a) and (c). The Board will make these changes, and they are reflected in the attached Order.

SODIC SOILS

The hearing conducted in this matter on December 10, 1986, generated a subject of interest which had previously not been one of the plethora of issues which were already present in this proceeding. The new issue concerns "sodic" soils, or those soils having uncharacteristically high levels of "free" sodium (R. at 19). The occurrence of sodic soils is significant because the particles of soils having that condition will not tend to flocculate, but will rather tend to disperse (Id.). Because such particles resist settling, the discharges of ponds receiving runoff from sodic soil areas may contain high levels of total suspended solids yet meet the SS standard.

The topic of sodic soils was raised at hearing by Dr. Barfield, who is familiar with studies concerning the existence of sodic soil conditions in Kentucky (R. at 47-48). Dr. Barfield also indicated that he knows of a consultant who has done work concerning some Illinois watersheds and has found some isolated instances of sodic soils in Illinois (R. at 163).

At this point in time the Board can only state that questions such as whether sodic soils exist in Illinois, where they exist, and what impact they have on the monitoring of sedimentation pond performance warrant more investigation and study. The Board has searched for additional information on this subject, but has been unable to locate answers to these and other questions. Even Dr. Barfield was unable to quantitatively define a soil that might be considered "sodic" (R. at 47-48), and did not have any personal knowledge concerning the location of sodic soils in Illinois (R. at 163). If in the future it is discovered that sodic soils exist in Illinois in some significant degree, a future Board may do well to consider amending these regulations to reflect the existence of such soils and the ramifications they pose to the monitoring of pond performance.

ORDER

The Board directs that second notice of the following proposed amendments be submitted to the Joint Committee on Administrative Rules.

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE D: MINE RELATED WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 402
DEFINITIONS

Section	
402.100	**Terms Defined Elsewhere**
402.101	**Definitions**

AUTHORITY: Authorized by Section 27 and implementing Sections 12 and 13 of the Illinois Environmental Protection Act (Ill. Rev. Stat., ch. 111 1/2, pars. 1012, 1013 and 1027) unless otherwise noted.

SOURCE: 4 Ill. Reg. no. 34, p. 164, effective August 7, 1980; Codified 5 Ill. Reg. no. 34, p. 8527, effective August 21, 1981 unless otherwise noted; Amended at _____ Ill. Reg. _____, effective _____.

Section
402.100 Terms Defined Elsewhere

Unless otherwise stated or unless the context clearly indicates a different meaning, the definition of terms used in this Chapter are the same as those found in the Illinois Environmental Protection Act (Act), (Ill. Rev. Stat. 1979, ch. 111 1/2, Section 1001 et seq.), the Water Pollution Regulations of the Illinois Pollution Control Board (Subtitle C, Chapter I) and the Federal

Water Pollution Control Act of 1972 (FWPCA) (33 U.S.C. 1251 et seq., 1972 as amended). The following definitions which apply to this Chapter can be found in the Act, Subtitle C, Chapter I or the FWPCA: **Administrator, Agency, Board, Contaminant, Effluent, Federal Water Pollution Control Act (FWPCA), National Pollutant Discharge Elimination System (NPDES), Point Source Discharge, Pollutant, Refuse, Storet, Treatment Works, Underground Waters, Wastewater, Wastewater Source, Water Pollution** and **Waters.**

Section
402.101 Definitions

For purposes of this Chapter the following terms are defined:

"Abandon": to transfer ownership of or to close down mining activities, a mine or mine refuse area with no intention by that operator to reopen the affected land. A mine or mine refuse area which has been inoperative for one year shall be rebuttably presumed to be abandoned.

"Acid or Ferruginous Mine Drainage": mine drainage which, before any treatment, has a pH of less than 6.0 or a total iron concentration greater than 10 mg/L.

"Acid-producing Material": material which when exposed to air and water is capable of causing drainage containing sulfuric acid. In determining whether material is acid-producing, consideration shall be given to the sulfur content of the material, the size and spatial distribution of pyritic compounds and other compounds of sulfur, the neutralizing effect of surrounding intermixed materials and the quality of drainage produced by mining on sites with similar soils.

"Affected Land": any land owned or controlled or otherwise used by the operator in connection with mining activities except the surface area above underground mine workings that is not otherwise used for mining activities. The term does not include offsite office buildings and farming operations or recreational activities on undisturbed land. Land described in a certificate of abandonment issued by the Agency under Section 405.110(e) is no longer part of the affected land.

"Alkaline Mine Drainage": mine drainage which, prior to treatment, has a pH equal to or greater than 6.0 and a total iron concentration of less than 10 mg/L/.

"Aquifer": a zone, stratum or group of strata which can store and transmit water in sufficient quantities for a specific use.

"Base Flow": any flow which is not a result of immediate runoff from precipitation. It includes, but is not limited to, groundwater flow, mechanical pumpages, springs, discharges from

subsurface drainage systems, and controlled outfalls from other treatment works. It is normally any flow beyond 24 hours after the rainfall ceases.

"Coal Preparation Plant": a facility where coal is subjected to cleaning, concentrating, or other processing or preparation in order to separate coal from its impurities.

"Coal Preparation Plant Associated Areas": coal preparation plant yards, immediate access roads, coal refuse piles and coal storage piles and facilities.

"Coal Refuse Disposal Pile": any coal refuse permanently deposited on the earth or stored for more than 180 days. It does not include coal refuse deposited within the active mining area or coal refuse never removed from the active mining area.

"Coal Transfer Facility or Coal Storage Yard": any area were coal is transferred from one mode of transportation to another or where coal is dumped, piled, stored or blended. The term includes but is not limited to coal docks, blending yards, conveyor belts and pipelines. As used in this Chapter, the terms mining activity and mine related facility shall include coal transfer facilities and coal storage yards.

"Construction Authorization": authorization under Section 403.104 to prepare land for mining activities or to construct mine related facilities. Construction authorization is issued to a person who holds or is required to have an NPDES permit.

"Construction Permit": a state permit issued under Section 404.101 which allows the operator to prepare land for mining activities or to construct mine related facilities.

<u>"Controlled Surface Mine Drainage": any surface mine drainage that is pumped or siphoned from the active mining area.</u>

"Domestic Retail Sales Yard": a business which stockpiles coal or other materials solely for the purpose of supplying homeowners, small businesses, small industries or other institutions with the mineral for their individual consumption. The term does not include any sales yard located at a mine.

"Drainage Course": any natural or man-made channel or ditch which serves the purpose of directing the flow of water into a natural waterway.

"Facility": a contiguous area of land, including all structures above or below the ground, which is owned or controlled by one person.

"Mine Area or Mined Area": the surface and subsurface land where mining has occurred or is occurring. The term does not include the unmined surface land directly above underground mine workings which is not otherwise disturbed by mining activities.

"Mine Discharge": any point source discharge, whether natural or man-made, from a mine related facility. Such discharges include but are not limited to mechanical pumpages, pit overflows, spillways, drainage ditches, seepage from mine or mine refuse areas, effluent from processing and milling or mineral preparation plants. Other discharges including but not limited to sanitary sewers and sewage treatment works are not mine discharges. The term mine discharge includes surface runoff discharged from a sedimentation pond but does not include non-point source mine discharges.

"Mine Refuse": gob, coal, rock, slate, shale, mill tailings, boney, clay, pyrites and other unmerchantable solid or slurry material intended to be discarded which is connected with the cleaning and preparation of mined materials at a preparation plant or washery. It includes sludge or other precipitated matter produced by the treatment of acid mine drainage but does not otherwise generally include sediment from alkaline mine drainage. The term also includes acid-producing spoil.

"Mine Refuse Area": any land used for dumping, storage or disposal of mine refuse.

"Mine Refuse Pile": any deposit of solid mine refuse which is intended to serve as permanent disposal of such material.

"Mine Related Facility": a portion of a facility which is related to mining activities. The term includes, but is not limited to, the following:

a) Affected land;

b) Coal storage yard or transfer facility;

c) Mine;

d) Mine drainage treatment facility;

e) Mine refuse area; and

f) Processing or mineral preparation plant.

"Mining": the surface or underground extraction or processing of natural deposits of coal, clay, fluorspar, gravel, lead bearing ores, peat, sand, stone, zinc bearing ores or other minerals by the use of any mechanical operation or process. The term also includes the recovery or processing of the minerals from a mine

refuse area. It does not include drilling for oil or natural gas.

"Mining Activities": all activities on a facility which are directly in furtherance of mining, including activities before, during and after mining. The term does not include land acquisition, exploratory drilling, surveying and similar activities. The term includes, but is not limited to, the following:

a) Preparation of land for mining activities;

b) Construction of mine related facilities which could generate refuse, result in a discharge or have the potential to cause water pollution;

c) Ownership or control of a mine related facility;

d) Ownership or control of a coal storage yard or transfer facility;

e) Generation or disposal of mine refuse;

f) Mining;

g) Opening a mine;

h) Production of a mine discharge or non-point source mine discharge;

i) Surface drainage control; and

j) Use of acid-producing mine refuse.

"Mountaintop Removal": surface coal mining and reclamation operations that remove entire coal seams running through the upper fraction of a mountain, ridge, or hill by removal of all of the overburden and create a level plateau or gently rolling contour with no highwalls remaining.

"New Source Coal Mine": a coal mine, including an abandoned mine which is being remined, at which:

a) Construction commenced after May 4, 1984; or

b) A major alteration has resulted in a new, altered or increased discharge of pollutants. Major alterations are:

1) Extraction from a coal seam not previously extracted by that mine;

2) Discharge into a drainage area not previously affected by wastewater discharge from that mine;

3) Extensive new surface disruption at the mining operation; and

4) Construction of a new shaft, slope or drift.

"Non-point Source Mine Discharge": surface runoff from the affected land. The term does not include surface runoff which is discharged from a sedimentation pond or seepage from a mine or mine refuse area.

"Opening a Mine": any construction activity related to preparation for mining on a facility.

"Operating Permit": a state permit required of a person carrying out mining activities.

"Operator": a person who carries out mining activities.

"Permittee": a person who holds a state or NPDES permit issued under this Subtitle D, Chapter I. In some contexts the term permittee also includes a permit applicant.

"Person": any individual, partnership, co-partnership, firm, company, corporation, association, joint stock company, trust, estate, political subdivision, state agency, or any other legal entity, or their legal representative, agent or assigns.

"Processing or Mineral Preparation Plant": a facility used for the sizing or separation from the ore or raw mineral of coal, clay, fluorspar, gravel, lead bearing ores, peat, sand, stone, zinc bearing ores or other materials.

"Reclamation Area": the surface area of a coal mine which has been returned to the contour required by permit and on which revegetation work has commenced.

"Slurry": mine refuse separated from the mineral in the cleaning process consisting of readily pumpable fines and clays and other materials in the preparation plant effluent. This term includes mill tailings.

"Spoil": the accumulation of excavated overburden or other earth, dirt or rock overlying the mineral seam or other deposit excavated from its original location by surface or underground mining.

"State Permit" a construction permit or operating permit issued by the Agency. NPDES permits are not state permits.

"Steep Slope": any slope of more than 20 degrees.

"Surface Drainage Control": control of surface water on the affected land by a person who is engaging in mining activities. Control of surface water includes diversion of surface waters around or away from the active mining area or mine refuse area and diversion, redirection or impoundment of a stream or impoundment of water for flow augmentation or controlled release of effluents.

"Surface Mining": mining conducted in an open pit including area and contour strip mining.

"Underground Mining": mining conducted below the surface by means of constructing an access facility to the mineral deposit. The term includes slope, drift, shaft mines and auger or punch mining.

"Use of Acid-producing Mine Refuse": use of acid-producing mine refuse includes any use, offer for sale, sale or offer for use in roadway projects, mine roads, mine yards or elsewhere.

(Source: Amended at _____ Ill. Reg. _____, effective _____.)

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE D: MINE RELATED WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 406
MINE WASTE
EFFLUENT AND WATER
QUALITY STANDARDS

SUBPART A: EFFLUENT STANDARDS

Section

406.100 Preamble
406.101 Averaging
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406.105 ~~Violation of Water Quality Standards (Renumbered)~~ Commingling of Waste Streams
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SUBPART B: WATER QUALITY STANDARDS

Section

AUTHORITY: Implementing Sections 12 and 13 and authorized by Section 27 of the Illinois Environmental Protection Act (Ill. Rev. Stat. 1983, ch. 111 1/2, pars. 1012, 1013 and 1027).

SOURCE: Adopted in R76-20, R77-10, 39 PCB 196, at 4 Ill. Reg. 34, p. 164, effective August 7, 1980; codified at 5 Ill. Reg. 8527; emergency amendment in R83-6B at 7 Ill. Reg. 8385, effective July 5, 1983, for a maximum of 150 days; amended in R83-6B at 7 Ill. Reg. 14510, effective October 19, 1983; amended in R83-6A at 8 Ill. Reg. 13239, effective July 16, 1984; amended in R84-29 at _____ Ill. Reg. _____, effective _____.

Section
406.101 Averaging

a) Compliance with the numerical standards of this part shall be determined on the basis of 24-hour composite samples averaged over any calendar month. In addition, no single 24-hour composite sample shall exceed two times the numerical standards prescribed in this part nor shall any grab sample taken individually or as an aliquot of any composite sample exceed five times the numerical standards prescribed in this part.

b) Subsection (a) of this section notwithstanding, if a permittee elects monitoring and reporting by grab samples as provided in Section 406.102(f), then compliance with the numerical standards of this part shall be determined on the basis of three or more grab samples averaged over a calendar month. In addition, no single grab sample shall exceed two times the numerical standards prescribed in this part.

c) The numerical standards for settleable solids are maximum values not to be exceeded at any time and are not subject to averaging.

d) The numerical standards for pH shall be within the specified range at all times and are not subject to averaging.

Section 406.102 Sampling, Reporting and Monitoring

a) Where treatment is provided for a discharge, effluent samples shall be taken at a point after the final treatment process and before entry into or mixture with any waters of the state.

b) Where treatment is provided the permittee shall design or modify structures so as to permit the taking of effluent samples by the Agency at the required point.

c) Where treatment is not provided for a discharge, effluent samples shall be taken at the nearest point of access to the discharge source at a point where the discharge leaves the mine or mine area or other portions of the affected land, but in all cases effluent samples shall be taken before entry into or mixture with waters of the state.

d) At a reasonable frequency to be determined by the Agency, the permittee shall report the actual concentration or level of any parameter identified in the state or NPDES permit. Each report submitted pursuant to this subsection shall include at least three samples taken from each pond discharge during three separate periods occurring during that reporting period in which the alternate limitations for precipitation events of Section 406.109 and 406.110 were in effect. If such alternate limitations are in effect on fewer than three separate occasions during a reporting period, one sample shall be taken of each pond discharge during each occasion in that period when the alternate limitations are in effect. The operator shall have the burden of proof that the discharge or increase in discharge was caused by the applicable precipitation event.

e) The Agency may by permit condition require monitoring and reporting on the basis of 24-hour composite samples averaged over calendar months. However, grab samples or composite samples of shorter duration may be permitted by the Agency after demonstration that such samples reflect discharge levels over standard operating conditions.

f) Subsection (e) of this Section notwithstanding, if a permittee so requests, the Agency shall by permit condition require monitoring and reporting on the basis

of grab samples, in which case Section 406.101(b) will apply.

g) Monitoring as required in this rule shall continue after abandonment until the permittee has reasonably established that drainage complies with and will continue to comply with the requirements of the Act and this Chapter.

h) All methods of sample collection, preservation and analysis used in applying any of the requirements of this Chapter shall be in accord with the United States Environmental Protection Agency's current manual of practice or with other procedures acceptable to the United States Environmental Protection Agency and the Agency.

Section 406.105 ~~Violation of Water Quality Standards (Renumbered)~~Commingling of Waste Streams

Where waste streams from any facility described in this Part are combined for treatment or discharge with other waste streams from another facility, the concentration of each pollutant in the combined discharge may not exceed the most stringent limitations for that pollutant applicable to any component waste stream of the discharge.

(Source: Amended in R84-29 at _____ Ill. Reg. _____, effective _____.)

Section 406.106 Effluent Standards for Mine Discharges

a) The effluent limitations contained in 35 Ill. Adm. Code 304 shall not apply to mine discharges or non-point source mine discharges.

b) ~~No person shall cause or allow~~Except as provided in 35 Ill. Adm. Code 406.109 and 406.110, a mine discharge effluent ~~to~~ shall not exceed the following levels of contaminants:

Constituent	Storet Number	Concentration
Acidity	00435	(total acidity shall not exceed total alkalinity)
Iron (total)	01045	3.5 mg/l
Lead (total)	01051	1 mg/l
Ammonia Nitrogen (as N)	00610	5 mg/l
pH	00400	(range 6 to 9)

Zinc (total)	01092	5 mg/l
Fluoride (total)	00951	15 mg/l
Total suspended solids	00530	35 mg/l
Manganese	01055	2.0 mg/l

~~1)~~ ~~pH is not subject to averaging.~~

2) The ammonia nitrogen standard is applicable only to an operator utilizing ammonia in wastewater treatment.

~~3)~~ ~~Any overflow, increase in volume of a discharge or discharge from a by-pass system caused by precipitation or snowmelt shall not be subject to the limitations of this Section. This exemption shall be available only if the sedimentation basin or treatment works is designed, constructed and maintained to contain or treat the volume of water which would fall on the areas tributary to the discharge, overflow or bypass during a 10-year, 24-hour or larger precipitation event (or snowmelt of equivalent volume). The operator shall have the burden of demonstrating that the prerequisites to an exemption set forth in this subsection have been met.~~

4) The manganese effluent limitation is applicable only to discharges from facilities where chemical addition is required to meet the iron or pH effluent limitations. The upper limit of pH shall be 10 for any such facility that is unable to comply with the manganese limit at pH 9. The manganese standard is not applicable to mine discharges which are associated with areas where no active mining, processing or refuse disposal has taken place since May 13, 1976.

c) New source coal mines shall be subject to a total iron limitation of 3.0 mg/l in addition to the requirements of subsection b) above.

(Source: Amended in R84-29 at _____ Ill. Reg. _____, effective _____.)

Section 406.109 Effluent Standards for Coal Mine Discharges from Reclamation Areas

a) The effluent limitations contained in 35 Ill. Adm. Code 304 and 406.106 shall not apply to mine discharges from reclamation areas.

b) A mine discharge effluent from a reclamation area shall not exceed the following levels of contaminants:

Constituent	Storet Number	Concentration
Settleable solids		0.5 ml/l
pH	00400	(range 6-9)

c) Notwithstanding b), above, any discharge, or increase in the volume of discharge caused by precipitation within any 24 hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall be subject only to a pH limitation (range 6-9).

Section 406.110 Alternate Effluent Standards for Coal Mine Discharges During Precipitation Events

a) Discharges of alkaline mine drainage (except discharges from underground mines that are not commingled with other discharges eligible for these alternate limits), discharges from mountaintop removal operations, discharges from steep slope areas, and discharges from coal preparation plants and plant associated areas, except for drainage from coal refuse disposal piles are eligible for alternate effluent limitations during precipitation events. Any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) may comply with the following limitations instead of those in 406.106(b):

Constituent	Storet Number	Concentration
Settleable solids		0.5 ml/l
pH	00400	(range 6-9)

b) Discharges of acid or ferruginous mine discharge from coal refuse disposal piles are eligible for alternate effluent limitations during precipitation events. Any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period greater than the 1-year, 24-hour precipitation event and less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) may comply with the following limitations instead of those in 406.106(b):

Constituent	Storet Number	Concentration
Settleable solids		0.5 ml/l
pH	00400	(range 6-9)

c) Discharges of acid or ferruginous mine drainage (except for discharges in subsection (b), above, mountaintop removal areas, steep slope areas, controlled surface mine discharges and discharges from underground workings):

1) caused by precipitation within any 24 hour period less than or equal to the 2-year, 24-hour precipitation event (or snowmelt of equivalent volume) may comply with the following limitations instead of those in 406.109(b):

Constituent	Storet Number	Concentration
Settleable solids		0.5 ml/l
Iron (total)	01045	3.5 mg/l
pH	00400	(range 6-9)

2) Caused by precipitation within any 24 hour period greater than the 2-year, 24-hour precipitation event but less than or equal to the 10-year, 24-hour precipitation event shall be subject to the requirements of subsection c) 1), above, except for the total iron effluent standard.

d) All discharges mentioned in (a), (b), and (c) of this section, discharges of acid or ferruginous mine drainage from underground workings which are commingled with other discharges and controlled acid or ferruginous surface mine discharges caused by precipitation within any 24 hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) shall be subject only to a pH limitation (range 6-9).

IT IS SO ORDERED.

John Marlin concurred.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 30th day of April, 1987, by a vote of 6-0.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board