ILLINOIS POLLUTION CONTROL BOARD
September 11, 1986

IN THE MATTER OF:	)	
	)	
SITE-SPECIFIC RULEMAKING FOR CENTRAL ILLINOIS LIGHT COMPANY.	)	R85-7

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

PROCEDURAL HISTORY

On March 6, 1985, Central Illinois Light Company ("CILCO") filed a petition for site-specific rulemaking with the Board. Specifically, CILCO requests that it be granted exception from the total suspended solids ("TSS") limitation of 35 Ill. Adm. Code 304.124(a) and 304.104(a), which presently limit effluent discharges from the ash pond at CILCO's E.D. Edwards Station ("Station") to 15 milligrams per liter (mg/l) of TSS (STORET number 00530) as a monthly average and 30 mg/l as a daily maximum. In place of these limits, CILCO proposes that it be subject to Best Practicable Technology ("BPT") limitations pursuant to 40 CFR 423.12 (b)(4). BPT specifies limits on TSS discharges from ash ponds to 30 mg/l as an average of daily values for a calendar month and 100 mg/l as a maximum for any one day.

Hearing was held in this matter September 11, 1985, at the Peoria Public Library. Testimony was presented by Mr. Steven L. Burns, Senior Water Pollution Control Engineer for CILCO, and Mr. David Nott, Instrument and Chemical Supervisor at the Station.

At hearing the Illinois Environmental Protection Agency ("Agency") reserved comment on CILCO's proposal. However, on January 21, 1986, the Agency filed a recommendation that CILCO's petition be denied. On February 19, 1986, CILCO filed comments in response to the Agency's recommendation. In its recommendation the Agency raised issues not previously addressed in the record. This action caused the Hearing Officer in an Order dated February 19, 1986, to request that the Agency and CILCO further address these matters. Responses to the Hearing Officer's Order were filed by the Agency and by CILCO, both on April 2, 1986. No other comment on CILCO's request have been received by the Board, either at hearing or through filings.

The Illinois Department of Energy and Natural Resources made a "Negative Declaration" of economic impact in this matter on December 5, 1985, noting that the declaration is appropriate based on the statutory criteria in Ill. Rev. Stat., Ch. 92 1/2 par. 7404(d)(2) (1985). The Economic Technical Advisory Committee concurred in this determination on December 6, 1985.

For the reason discussed below, the Board declines to grant the regulatory change requested by CILCO. CILCO's petition will therefore be denied.

OVERVIEW OF ARGUMENTS

CILCO contends that ash pond discharges such as those of its Station cannot consistently achieve the TSS limitations imposed by Illinois regulations. It argues that a combination of factors, including high concentration of influent TSS and algal growth within the pond, frustrate all efforts at attaining compliance. CILCO additionally believes that BPT limitations are achievable and are the most appropriate from both environmental and economic perspectives.

The Agency alternatively contends that it is the limited area and volume of the Station's ash pond which causes it to fail to consistently meet the Illinois standards. The Agency states that ash ponds at other facilities in the State, including those which are subject to similar influent compositions, do achieve consistent compliance. Although allowing that the requested relief would be unlikely to pose any significant threat to the receiving stream, the Agency concludes that CILCO has not carried the burden of demonstrating that the relief is either necessary or equitable.

SITE CHARACTERISTICS

CILCO owns and operates a steam-electric generating plant known as the E.D. Edwards Station located approximately five miles south of Peoria, Illinois, at river mile 154.5 of the Illinois River. The station has three coal-fired electric generating units (1, 2, & 3) with respective net capacities of 117 megawatts ("MW"), 266 MW, and 361 MW. Unit 1 was installed in 1960, Unit 2 in 1968, and Unit 3 in 1972.

The three units burn pulverized coal and produce ash as a by-product of the coal combustion. It is estimated that 76% of the total ash production is fly ash collected by electrostatic precipitators, 20% is bottom ash collected in bottom ash hoppers, and 4% is ash collected from economizers (Ex. 18, p. 3-15). The fly ash is collected dry and stored in silos (R. at 111-2). Subsequently it may be trucked off site, or it may be mixed with water and sluiced to the ash pond at issue in this matter. Both the bottom ash and the economizer ash are collected wet and sluiced directly to the ash pond. All sluice water is drawn from the Illinois River.

The ash pond in question is an 84-acre pond located on-site. In addition to the combustion waste ash, the pond also receives small amounts of coal pile runoff, certain sump discharges, and the discharge from a holding pond which itself

receives yard runoff and sump discharges. Excess water from the pond is drawn off as an effluent at a standpipe structure located on the east side of the pond and discharges through a pipe directly onto the Illinois River. Effluent flows average 4.43 million gallons per day (MGD) and reach a maximum of 5.99 MGD (Ex. 18, p. 3-17).

The ash pond began operation in 1960 and has been dredged several times. Dredged ash is accumulated within the confines of the pond. The ash pond serves to reduce TSS in the sluice and runoff water by the process of sedimentation, primarily in a delta located along the north and west sides of the pond. In its present configuration the pond is asserted to have a retention period of over 90 hours for approximately 90 percent of the sluice water and a breakthrough time of approximately 9 hours (R. at 19), as based on a retention time study conducted by CILCO (Ex. 13). Annual deposition is approximately 50,000 cubic yards, at which rate the pond is projected to be filled by 1999 (R. at 34).

PROBLEM

Effluent from the ash pond has not consistently met the 15 mg/l TSS monthly average limitation specified in 35 Ill. Adm. Code 304.124(a) nor the 30 mg/l daily maximum limitation specified in 35 Ill. Adm. Code 304.104(a). Of 74 monthly averages during the period July, 1979, through June, 1985, 27, or 36% exceeded 15 mg/l (Ex. 5). For the same period, 16 of 303 analyses, or 5% of the total, have exceeded the 30 mg/l daily maximum TSS concentration (R. at 17-18).

There is no discernable trend in the number of excursions during the 1979-85 period of record emphasized by CILCO in its presentation at hearing and submissions to the record (Ex. 4 and 5), in spite of the efforts undertaken by CILCO to reduce excursions (see below). However, the Agency notes that a distinct increase in the number of excursions is discernable when 1974-79 data are compared with the 1979-85 data, as shown in Exhibits 8 and 9 (Figures 3 and 4 of Petition). The Agency attributes this increase to a reduction in volume and area of the pond, and an attendant reduction in settling opportunity. CILCO does note that there were two operational modifications at the Station in 1979: the plant switched to coal from a different source, and the present pneumatic fly ash collection system was put into operation (R. at 87-88). However, CILCO has not supplied supporting evidence to demonstrate how these operational changes might have affected TSS in the pond discharge nor has it addressed the issue of why during the earlier 1974-79 period the ash pond appears to have functioned with minimal or no excursions.

CILCO argues that it has attempted to identify the cause(s) of the more recent TSS excursions and has undertaken numerous attempts to correct the cause(s). Among the causes of excursions CILCO cites high TSS levels in the influent sluice water drawn from the Illinois River as a major contributing factor in almost all cases (R. at 37, 59-62). CILCO additionally contends, and is supported by its consultants (Ex. 14), that some of the influent TSS consists of colloidal solids which cannot effectively be removed by settling or sedimentation in the ash pond.

TSS concentrations have in fact been higher in the Illinois River than in the ash pond effluent at all times when synchronous samples were available, with Illinois River concentrations typically exceeding those of the ash pond discharge by a factor of approximately 5 (Ex. 10). CILCO believes that the high TSS levels in the Illinois River stem from a combination of factors, including the large amount of barge traffic in the river, turbulence from which inhibits settling of suspended materials; the location of the Station downstream from the Peoria Lock and Dam, which promotes local turbulence and which causes all of the easily settleable particles to have been removed above the dam, and the upstream entry of Farm and Kickapoo Creeks, both high TSS streams (R. at 63).

Another regularly occurring causative factor identified by CILCO is the in-pond growth of algae. CILCO argues that algae naturally present in the influent water propagate in the clarified water of the ash pond. When discharged through the pond outfall the algae are detected as suspended solids (R. at 38-39). CILCO estimates, based on a study of the percent volatiles in the effluent (EX. 12), that approximately 30% of the ash pond effluent TSS on the average consists of algae (R. at 41).

CILCO additionally examined each of the 77 (out of 303 total) daily concentrations over 15 mg/l for the period July, 1979, through June, 1985, and identified the following causative factors contributing in part or in total to the recorded values (Ex. 1): algal blooms in the ash pond (8), inadequate retention time (14), failure of fly ash to fully wet (10), rapid ice melt releasing entrapped ash particles (5), flooding in the Illinois River producing entrained colloids in the influent sluice water (7), boom malfunction (13), invalid sampling due to contamination of the sampling pipe (5), river backup into the sampling pipe (2), high winds carrying ash particles over the outfall boom (4), thermal inversion in the ash pond (3), propwash from a survey crew's boat (1), and various activities associated with construction and dredging (6).

COMPLIANCE EFFORTS AND ALTERNATIVES

Actions undertaken by CILCO to correct these causes include: in 1979, installation of an outflow boom and two dredging operations; in 1980, installation of an additional boom, modification of the outfall structure, lengthening of the ash sluice line, and two additional dredging operations; in 1981, installation of a diversion boom to reduce floating particles and further dredging; in 1982, repair of the boom system and additional dredging; in 1983, dredging; in 1984, further repair and modification of the boom system and additional dredging; in 1985, additional dredging (Ex. 2). In addition to increasing pond capacity, dredging operations, which usually have been conducted twice each year, have also focused on construction of channelways and "pond-within-pond" structures to increase both retention and settling time (R. at 31-33). Several boom configurations have been utilized, with the present and apparently most successful consisting of three separate booms in combination with a silt curtain and float collar.

CILCO contends that the various surveys and corrective activities undertaken through mid-1985 on the ash pond and its outfall structure have cost approximately $486,700.00 (R. at 18), and are still not adequate to assure that the ash pond effluent will consistently meet the 15/30 mg/l standards. CILCO further contends that there is little assurance that additional remedial actions undertaken to the ash pond and/or its outfall structure will reduce the TSS in the effluent to comply with the 15/30 mg/l limits (R. at 59).

As alternative compliance programs, CILCO has considered a physiochemical treatment program, expansion of the present pond, and partial or complete abandonment of the ash pond in favor of an alternative ash disposal system. The physiochemical treatment process investigated consists of chemical coagulation, flocculation, and precipitation followed by filtration. CILCO's engineering consultant, with CILCO's concurrence (R. at 59), believes that physiochemical treatment is the only method by which the frequency of TSS effluent excursions beyond the present standards could be further decreased (Ex. 14). However based on a 1983 consultant's report CILCO contends that such a system is unreasonably expensive. Estimated capital expenditure in 1985 dollars is $4,610,000 (R. at 20), with first year operation and maintenance costs of $204,000; CILCO contends that the operating cost alone is approximately 17 percent of the entire 1985 operation and maintenance budget for all pollution control programs at the Station (R. at 20). The total expense equates to a levelized annual cost of $550,000 (1985 dollars) over the twenty-five year life span of the system (R. at 20).

CILCO has considered and rejected the alternative of development of a new or enlarged on-site ash pond. CILCO argues that there is presently insufficient land available on the grounds of the Station (R. at 61). Moreover, recent construction of a similar pond at CILCO's Duck Creek Generating Station is asserted to have cost $11 million, exclusive of land acquisition (R. at 61). Finally, CILCO believes that the present Illinois TSS limitations could not be met with a new or enlarged pond (R. at 60).

CILCO has considered several alternatives to on-site disposal of its waste ash. Among these are active marketing and sale of the waste ash, giving away the waste ash, and landfilling part or all of the ash. Some sale and/or give-away of ash presently occurs, but not at a rate sufficient to accommodate the volumes of ash which are produced. CILCO has indicated a desire to increase this method of ash disposal (R. at 36), but has not placed on record an evaluation of possible success.

Landfilling of the ash, assuming a suitable site could be found or developed, is estimated by CILCO to cost roughly $10 to $14 per ton (R. at 62), which would involve an annual cost generally comparable to physiochemical treatment. If only the fly ash were to be landfilled and the bottom continued to be disposed in the ash pond, CILCO believes that the effluent would still exceed standards due to the high content of influent TSS and algal growth within the pond (R. at 62).

FEDERAL GUIDELINES

TSS limitations for effluent from ash ponds are more stringent under Illinois law than under federal BPT guidelines. Specifically, the United States Environmental Protection Agency ("USEPA") has promulgated BPT ash pond effluent limitations, set forth in 47 Fed. Reg. 52,290 (November 19, 1982) (codified in 40 CFR 423.12(b)(4)), specifying that the average daily TSS for thirty consecutive days shall not exceed 30 mg/l and that the maximum for any one day shall not exceed 100 mg/l; it is this level of limitation that is requested by CILCO. The BPT guidelines were established after USEPA studied fuel types, equipment, age and size of plants, water usage, and waste water constituents involved in the steam electric power industry. The USEPA additionally considered the type, performance, and cost of control and treatment technologies available for potential use in this industry.

In contrast, the Illinois standards are based upon accepted performance levels for removing suspended solids in industrial waste streams in general. CILCO contends that the USEPA's concentration limits are much more reflective of the nature of, conditions experienced by, and control and treatment technologies

available to, the steam electric power industry than are those contained in the Illinois regulations.

The Agency argues to the contrary. Specifically, the Agency asserts that the steam electric generating industry generally is capable of complying with the Illinois limitations as based on actual compliance records. Specifically, the Agency notes that, in a review of its permit and compliance files, it found no examples of power plant ash ponds which were incapable of achieving consistent compliance with the applicable effluent limits for TSS (Agency Response to Hearing Officer Order, p. 4).

The Agency additionally asserts, that the "USEPA's BPT levels are the minimum effluent limitations which the Agency can enforce within its NPDES permitting authority" (Reponse to Hearing Officer Order, p. 9; emphasis in original), and hence are not necessarily identical in purpose to the Illinois standards. The Agency further notes that the USEPA has not yet proceeded beyond its BPT guidelines to the next step of promulgating Best Conventional Pollutant Control Technology ("BCT"). Given these circumstances, the Agency argues that CILCO bears the obligation of demonstrating that the federal guidelines are more appropriate than the State standard, an obligation which the Agency asserts has not been met.

ENVIRONMENTAL IMPACT

CILCO contends that its present ash pond discharge has no adverse environmental impact on the receiving stream, the Illinois River (R. at 64). It points out that the reach of river adjacent to the plant is a very productive fishery for shad and freshwater drum, and that many fishermen utilize the stream, particularly congregating around the condensor discharge structure and below the ash pond discharge (R. at 64). CILCO further contends that if 30 mg/l monthly average and 100 mg/l daily maximum standards were in place, the TSS discharge from the ash pond would still normally be below that of the river, and hence that the ash pond effluent would continue to be cleaner than the water of the Illinois River (R. at 65).

The Agency agrees that the requested relief would be unlikely to pose any significant threat to the receiving stream water quality, noting that the discharge is to a relatively turbid stretch of a major river (Rec. p.5).

CONCLUSIONS

The Board finds it difficult to give weight to CILCO's contention that the elevated TSS levels in its effluent are attributable in major part to elevated levels in the influent water. Admittedly, the waters of the Illinois River are often turbid, and TSS concentrations of several hundreds of milligrams

per liter are not uncommon. However, in the sluicing process employed by CILCO this influent water is mixed with large volumes of ash, thereby increasing its TSS concentration to very much higher levels than those of the raw influent water. It is at this stage, after CILCO has received the water, that the water achieves its maximum concentration of TSS, and it is this highly charged sluiced water which is required to be cleansed to the point of becoming an acceptable effluent. It is inescapable that even if CILCO had available to it an influent which was totally devoid of TSS, it would still be required to operate an ash pond which would function to a high degree of efficiency to remove the sluiced ash. Moreover, it is undemonstrated by CILCO that the non-organic TSS which occur in the effluent consist of the same solids which where derived from the river, as opposed to solids which were added as a consequence of using the water to sluice ash.

The Board believes that CILCO has failed to adequately address why the ash pond was capable of performing to standard in the past, but is apparently incapabale of doing so now. If, indeed, it is the character of the influent water which is responsible for the present excursions, it would seem that similar excursions would have occurred in the past; there is no reason to believe, nor is it contended, that the character of the influent water has altered to a state which now causes higher excursion levels.

The Agency has expressed the belief that the fundamental cause of the present excursions is that the ash pond is too full to provide the necessary settling opportunity. CILCO has countered only with assertions that plant modifications and/or increases in the level of TSS in the influent water are possible causative factors. While the record does not allow the Board to determine which of these perspectives is correct, we do note that CILCO has failed to counter the arguments of the Agency.

The Board similarly believes that CILCO has failed to adequately address the issue of equitable and fair treatment. The Agency contention that the electric stream generation industry in Illinois can and does comply with existing TSS standards at facilities other than the Station has not been refuted. The Board believes that, in the absence of evidence to the contrary, granting of the requested relief to CILCO could conflict with the goals of equitable and fair treatment.

Finally, the Board notes that CILCO has not demonstrated that compliance is technically infeasible. Compliance was clearly feasible at the Station between 1974 and 1979, and it is unrefuted that other electrical generating facilities in Illinois are presently able to maintain ash ponds in compliance with Illinois regulations. Similarly, CILCO has not made a demonstration that compliance is economically unreasonable.

Again, other facilities have achieved compliance, and CILCO has not demonstrated any special conditions existent at the Station which would allow the Board to determine that the Station is in an economic position distinct from these facilities.

In view of the above considerations, the Board determines that the site-specific relief requested by CILCO must be denied.

ORDER

The March 6, 1985, petition for site-specific exception to effluent standards for Central Illinois Light Company is hereby denied.

IT IS SO ORDERED.

Board Members Jacob D. Dumelle and Bill Forcade concurred.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 11th day of September, 1986, by a vote of 6-0.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board