

ILLINOIS POLLUTION CONTROL BOARD
March 7, 1972

In the Matter of)
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EFFLUENT CRITERIA) #R 70-8

In the Matter of)
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WATER QUALITY STANDARDS REVISIONS) #R 71-14

In the Matter of)
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WATER QUALITY STANDARDS REVISIONS) #R 71-20
FOR INTRASTATE WATERS (SWB-14))

Opinion of the Board (by Mr. Currie):

On May 12, 1971, we published a proposed Chapter IV of the Rules and Regulations of the Pollution Control Board, comprising a complete recodification and revision of all existing regulations respecting water pollution. Extensive hearings were held throughout the State, from June to October. Upon studying the transcripts and exhibits, we published a partial proposed final draft on November 11, including principally those provisions, many of them originally proposed in #R 70-8 and the subject of separate hearings last winter, respecting effluent standards, permits, and control of storm overflows. On December 21 we published a second proposed final draft containing additional provisions considered at the hearings. On January 6, 1972, we adopted many of the provisions in the November 11 draft (see opinion and order of that date), postponing effluent standards for deoxygenating wastes and for bacteria, as well as permit and overflow provisions. Final hearings were held on these subjects and on the December 21 draft, and we today adopt final provisions as to all remaining matters. Today's regulations supplement and do not repeal those adopted January 6. This opinion explains today's action.

In large part today's draft is simply a codification of existing water quality standards and associated provisions that are now scattered throughout a number of separate regulations that we inherited from the Sanitary Water Board. The new regulations, when adopted, will supersede the old except for determining violations alleged to have occurred prior to the effective date of the new regulations. In addition, today's new regulations contain the following changes, among others:

- 1) A more stringent dissolved-oxygen requirement for better protection of aquatic life.
- 2) The designation of additional waters, such as the remaining portions of the Illinois River, to be protected for aquatic

life and bodily contact.

- 3) Additional communities required to go beyond traditional secondary sewage treatment.
- 4) Limited relief from the highest degree of tertiary treatment for communities that can prove a more economical means of tertiary treatment sufficient to assure satisfactory water quality and compliance with water quality standards.
- 5) Compliance programs required in certain cases to assure compliance with stream standards for ammonia and phosphorus.
- 6) A two year acceleration of the deadline in most communities for control of pollution from combined sewer overflows, one of the State's most serious water pollution problems.
- 7) The highest degree of treatment required for sewage or similar wastes discharged to Lake Michigan.
- 8) Allowance for treatment lagoons that small communities can afford and can operate successfully, provided water quality standards can be met.
- 9) A December, 1973 deadline for treatment beyond secondary, based on recent changes in applicable laws. We have allowed up to one year in past cases for compliance with the Agency's revised criteria respecting algae from effluent polishing lagoons. An additional six months seems a reasonable price for saving millions of dollars under today's new standard. In addition, adherence to the existing paper deadline would not assure compliance by that date; most communities cannot meet that date in any event.
- 10) Year-round disinfection of sewage treatment plant effluents.
- 11) A prohibition of discharges to sewers that interfere with the operation of treatment plants.
- 12) A comprehensive permit requirement for new and existing sources.
- 13) Protection for underground waters.

A section-by-section discussion follows.

Rules 101-103 are standard statements of the Board's authority and policy, substantially as in present regulations, and a repealer of obsolete provisions. Rule 104 contains definitions in addition to those adopted January 6. The definitions largely speak for themselves. Since the preceding drafts we have added an Agency-suggested definition of "Modification"

and revised the definitions of dilution ratio and population equivalent as urged by the Institute and by the Agency respectively. Our earlier definition of one P.E. as 0.2 pounds of BOD₅ per day was based on a misunderstanding of an Agency guideline.

Part II is the heart of the water quality standards and constitutes an updated version of the criteria now found in regulations SWB-7 through SWB-15:

201 Mixing Zones. Existing standards by and large provide for "reasonable admixture" of effluents in a mixing zone that is not subject to the water quality standards. This is necessary unless effluent standards are to be as stringent as water quality standards, which in some cases (e.g., temperature, see #R 70-16, Mississippi Thermal Standards, November 15, 1971) would impose an unreasonable cost burden. At the same time, if the water quality standards are not to be undermined, the area within mixing zones must be kept relatively small.

Technical Release 20-22 of the Sanitary Water Board, long used as a guideline without the force of a regulation, provided that reasonable mixing would be deemed to occur within 600 feet from the point of discharge. We have held that this figure represents the understanding of the Sanitary Water Board in adopting the reasonable mixture standard, at least with regard to the larger rivers, and therefore have required that on the Illinois, Wabash, Ohio, and Mississippi Rivers the standards be met outside a zone 600 feet in its greatest dimension. See Application of Commonwealth Edison Co. (Dresden #3), # 70-21 (March 3, 1971); Mississippi Thermal Standards, # R 70-16, supra; Ohio-Wabash Thermal Standards, # R 71-12, June 28, 1971. On the other hand, we have expressed doubt that such a large mixing zone could have been intended on small streams, since a few 600-foot zones on such streams would undermine the stream quality standards altogether. See EPA v. City of Champaign, # 71-51C, September 16, 1971.

The May 12 draft incorporated the 600-foot standard across the board, but consideration of the Champaign case, just cited, suggests a more flexible test is desirable. The basic standard today adopted, therefore, is expressed in terms of the principle that mixing zones must be kept very small in proportion to stream volume. Although the application of this principle must be determined on a case-by-case basis, this approach appears to be more responsive to the competing policy considerations underlying the mixing zone provisions than does any rigid size requirement. In response to other testimony received, today's regulation alters the 600-foot linear zone--here preserved as a maximum--to a zone no larger than the area of a circle with 600-foot radius, by analogy to the Lake Michigan standard (#R 70-2, June 9, 1971), recognizing that in flowing streams the shape of a plume is likely to be long and thin in a downstream direction.

The earlier provision intended to prevent increasing the size of the mixing zone by multiplication of discharge points has been reworded to avoid unintended restrictions. The formerly rigid provision requiring a fixed proportion of the stream as a zone of passage for fish has been made more flexible in order to leave details to individual cases while preserving the principle that thermal or other pollution blocks must be avoided. This provision applies only to waters protected for aquatic life.

202 Stream Flows. This Rule provides that water quality standards are to be met at all times except extreme low flows. This provision is the equivalent of that in existing regulations. An exception is provided, as in the Ohio-Wabash and Mississippi thermal standards, for brief excursions of temperature that are not likely to be harmful and that are the result of natural conditions peculiar to temperature. It is recognized that it may be necessary in the future to provide some type of episode control at times of extreme low flow in order to avoid harm to aquatic populations.

203 General Standards. Today's revision is based upon the principle that all waters should be protected against nuisances and against health hazards to those near them; that all waters naturally capable of supporting aquatic life, with the exception of a few highly industrialized streams consisting primarily of effluents in the Chicago area, should be protected to support such life; and that waters that are used for public water supply should be clean enough that ordinary treatment processes will assure their potability. Consequently general standards for water quality are set that will protect most uses except public water supply; more stringent standards are set for places where water is withdrawn for public supply; and more lenient standards are set for those streams classified for restricted use. The general standards are found in Rule 203 and their discussion follows. They are taken largely from existing criteria for aquatic life. Stream use designations are found in Part III.

203 (a) preserves the existing requirements for freedom from nuisance.

203 (b) retains the existing pH values for aquatic life.

203 (c) provides a phosphorus limit for reservoirs and lakes and for streams tributary to them. The evidence is strong that phosphorus above this level in relatively still water can give rise to obnoxious algae blooms. The evidence does not support the need for a phosphorus standard in other situations, and the proposal for such a standard is here omitted. So is the earlier proposal for an algae limit, which was too stringent to indicate the

presence of a nuisance. The evidence does not support any numerical standard for algae, and we rely upon the nuisance standard of 203 (a). We have not defined "reservoir" or "lake" for want of an adequate definition. This will have to be worked out on a case-by-case basis in light of the policy here expressed. Not every navigation dam will be held to create a lake for this purpose. Despite the uncertainty, it does not seem appropriate to postpone necessary regulation for lack of a perfect definition.

203 (d) adopts the May 12 proposal (6.0 mg/l for 16 hours and 5.0 minimum) for dissolved oxygen requirements for aquatic life. The present standard (5.0 and 4.0) is not optimum according to the Green Book of the National Technical Advisory Committee on Water Quality Criteria. The testimony of Dr. John Pfeffer of the Institute for Environmental Quality, discussed in more detail below, strongly supports the achievability of this revised standard, often without the highest degree of treatment that is feasible.

203 (e) retains existing radioactivity levels.

203 (f) lists a number of important contaminants as follows. "Dissolved" values have been changed to "total" for reasons given in the explanation of the proposed final draft of Nov. 11.

Ammonia Nitrogen. The present SWB-8 standard is 2.5 mg/l, which the Green Book (supra) says is acutely toxic to fish. The earlier 1.0 proposal was based upon a Minnesota standard. While the toxicity of ammonia is pH dependent, the Green Book recommends a limit of 1.5 mg/l, and that is here adopted.

Arsenic. The May 12 proposed level of 1.0 mg/l was based upon existing SWB-8 standards and the recommendation of McKee and Wolf, Water Quality Criteria, which is a well-respected literature survey, for protection of aquatic life. It is adopted today.

Barium. The May 12 proposal, adopted here, of 5.0 mg/l for aquatic life was based upon existing SWB-8 standards and the recommendation of McKee and Wolf.

BOD. The May 12 draft proposed a stream standard of 7.0 for biochemical oxygen demand (5-day). This was intended to facilitate determination of the degree of treatment required of dischargers without resort to complex formulas for computing oxygen sag and recovery. The evidence is that the effect of a given level of BOD on a stream is too dependent upon reaeration rates to make any prescribed standard meaningful. We have omitted it and will rely on the dilution ratios of Rule 404, together with proof of violation of dissolved oxygen levels by stream studies or otherwise, until more adequate proof is presented to support a BOD standard.

Boron. The May 12 and today adopted level of 1.0 mg/l is based on evidence that higher levels can harm irrigated crops. While 100% irrigation is unlikely in Illinois, the uncontrolled discharge of large quantities of boron is clearly undesirable. We have proposed no effluent standard because of the lack of evidence as to treatment methods. The testimony suggests that compliance with the stream standard should not be very difficult.

Cadmium. The 0.05 value proposed on May 12 and adopted today is the same as the present SWB-8 for aquatic life. McKee and Wolf suggest that an even lower value might be appropriate to protect some fish.

Chloride. Chlorides are tolerated by aquatic life in relatively high concentrations; Professor Lackey, a recognized expert in fish biology, testified that 500 mg/l would be a safe limit, and there was no substantial dispute. This value will also, according to the evidence, protect against any serious problems in drinking water. The undesirability of an overly tight chloride standard is underlined by the high cost of chloride removal as well as the relatively innocuous nature of the material.

Chromium. There is a dispute in the evidence as to the toxicity of chromium. McKee and Wolf support the testimony that the toxicity of chromium toward fish and man has been exaggerated, but stress the toxicity of small amounts of hexavalent chromium to daphnia and other important fish foods. The values here adopted preserve the existing SWB-8 aquatic standards for hexavalent (0.05 mg/l) and trivalent (1.0) chromium since McKee and Wolf appear to justify the distinction with regard to effects on fish foods. The May 12 proposal was a single standard of 0.05. The federal government asks that we adopt a single strict standard since trivalent chromium may be converted to hexavalent after discharge. If it does the hexavalent standard will apply, and we see no reason for a change.

Copper. Existing copper standards vary: SWB-8's is 0.04 mg/l, while SWB-12's (Mississippi River) is the same (0.02) as that proposed May 12 and adopted today. This figure is based on McKee and Wolf's recommendation for fish and aquatic life. Important fish foods are readily killed by low concentrations of copper, and McKee and Wolf say 0.025 mg/l has been found to kill most fish in 8 hours in the presence of 1.0 mg/l of zinc.

Cyanide. The present SWB-8 standard of 0.025 mg/l, here adopted, is that recommended by Orsanco. Twice that concentration, say McKee and Wolf, has killed fish in a short time, while trout were found to survive 27 days at 0.02 mg/l. The May 12 draft proposed 0.01 based upon the fact that such a level, not treatability, is the goal in setting water quality standards for general uses.

Fluoride. Fluoride can delay the hatching of fish eggs and has been reported by McKee and Wolf to kill trout at concentrations ranging from 2.3 to 7.2 mg/l. They recommend a standard of 1.5 mg/l. The figure of 1.4, here repeated from the May 12 draft, is in line with that recommendation and also should assure a potable supply.

Iron. The 1.0 mg/l standard proposed May 12 and adopted today is taken from the existing SWB-8. McKee and Wolf make no firm recommendation but report that dogfish survived a week's exposure to 1 to 2 mg/l of iron. Other species are said to have shown a lower toxic threshold.

Lead. 0.1 mg/l, proposed May 12 and adopted today, is the present SWB-8 aquatic standard and supported by McKee and Wolf's recommendation of 0.1, a level above which lead is lethal to some fish and begins to interfere with the breakdown of oxygen-demanding materials.

Manganese. There is no existing aquatic standard. The standard of 1.0 (May 12 and today) is based upon McKee and Wolf's report as to fish toxicity and should be easy to meet.

Nickel. There is no existing standard. McKee and Wolf report one study finding that sticklebacks die as low as 0.8 mg/l, but that others find nickel less toxic than iron or zinc. Today's rule, like that proposed May 12, is 1.0 mg/l.

Phenols. There is conflicting evidence as to the harmful level of phenols. The limiting value, according to the Green Book, is that concentrations above 0.1 mg/l impart a bad taste to fish. The May 12 draft and today's rule substitute 0.1 in place of the present SWB-8 standard of 0.2.

Selenium. No present aquatic standard exists, but McKee and Wolf say 2.0 mg/l kill goldfish in eight days. The May 12 proposal of 2.0 therefore seems too high, and 1.0 is here adopted, as in the proposed final draft, in order to keep the water below the harmful level.

Silver. The present SWB-8 standard is 0.05 mg/l, but McKee and Wolf report lethal doses to some fish at levels an order of magnitude lower. Accordingly, as proposed May 12, we adopt 0.005 mg/l.

Sulfates. As in the case of chlorides, some limit seems desirable to protect stock watering and fish. Dr. Lackey suggested that 500 mg/l would afford adequate protection for fish; McKee and Wolf give the same figure for stock watering; and this level should avoid serious adverse effects on public water supplies as well according to McKee and Wolf.

Total Dissolved Solids. This level of 1000 mg/l too is based largely on Dr. Lackey's testimony, confirmed by other witnesses and by McKee and Wolf, that aquatic life should not be harmed.

Zinc. 1.0 is the present SWB-8 aquatic standard proposed May 12 and adopted here. McKee and Wolf suggest that this is a safe level if the water is not particularly soft.

Additional chemicals were suggested by various witnesses for inclusion in the table, such as antimony, cobalt, and tin. We recognize the desirability of adding more parameters and will welcome specific suggestions for future additions, but codification of the present standards should not be delayed while new parameters are explored.

The May 12 draft contained a limit of 2.0 mg/l for the aggregate of toxic substances indicated by an asterisk in the above table. While the synergistic effect of various heavy metals or other toxics is a matter of considerable concern, we have insufficient basis for setting any particular number and therefore omitted this provision from the proposed final draft, leaving the question of synergism to be dealt with by general provisions such as paragraph (h) of Rule 203, below. The federal government calls our attention to a synergism formula in the NTAC Green Book, but we think opportunity for hearing should be afforded prior to the adoption of such a provision.

203 (g) tightens the bacterial limit from that designed for secondary contact to that described as safe for primary contact. This has the same effect as the May 12 draft, which provided a separate category of waters designated for primary contact but which designated all general waters for this use. Since disinfection is required of all relevant effluents, achieving the lower level should pose no great additional difficulty. Even if waters are not recommended for swimming because of other problems such as turbidity, barge traffic, or dangerous currents, they should not pose a health hazard to those who do use them.

203 (h) retains the present SWB-8 general provision that no substances shall be present in amounts representing a stated percentage of their toxic value to fish. This is most necessary because no regulation can possibly list all contaminants that are of concern.

The May 12 list of pesticides is omitted. It was obviously incomplete and seems better left to the general toxicity provisions of Rule 203 (h).

203 (i) has been amended to incorporate the newly adopted temperature standards for the Mississippi, Ohio, and Wabash Rivers and to preserve the existing maximum values for other streams (except to substitute 90° for 93 on the former industrial sector of the Illinois) pending further evidence as to actual temperature. The federal EPA urges us to adopt monthly maxima for other streams, which we shall be happy to do when we receive the necessary evidence. We are indebted to Mr. Clarence Stuebe for certain data from the water intake at Peoria that suggest the standard perhaps can be significantly tightened for some portions of the Illinois River.

The separate criterion for primary contact (formerly Rule 204) is omitted for reasons given under Rule 203 (g) above.

Rule 204 states standards for public water supplies. Despite the conclusion of McKee and Wolf that the recommended Public Health Service standards for chlorides, sulfates, and total dissolved solids in desirable drinking water are tighter than necessary as a regulatory matter, we have put back into today's regulation the existing requirement that all Public Health Service standards be met, on the recommendation of both federal and state EPA's and evidence that most Illinois waters are safely within these standards. Further proof of hardship is necessary to modify these existing standards. We have also reinstated the provision that the public supply standards need be met only where water is withdrawn for public supply. This provision will assure that water is satisfactory wherever it is taken, without requiring expensive cleanups of effluents where the water is not used for public supply. The construction of new public supply intakes will in some cases therefore require additional treatment of effluents upstream.

Since general criteria apply to all waters designated for public supply, the present regulation omits separate requirements for those parameters whose general standards are tight enough to protect public supplies; boron, chromium, copper, fluoride, mercury, silver, and zinc. The remaining standards are based largely upon the Public Health Service standards, as amplified by the Green Book and by McKee and Wolf. While the PHS explicitly states that its standards are intended to prescribe the quality of finished rather than of raw water, it is clear from the evidence that many of the metals and other contaminants here listed are not substantially affected by ordinary water supply treatment, and therefore, as the Green Book recommends, the raw water must itself meet the standard to assure satisfactory finished water.

The standards for barium, cadmium, lead, and selenium--together with chromium and silver, which are covered by general standards--are taken from the Public Health Service

standards whose violation in finished water results in rejection of the supply. These are toxic materials not removed by ordinary treatment of raw water. These numbers represent existing SWB-8 standards. For arsenic, the present standard, taken from the PHS rejection standard, is 0.05; as proposed May 12, we have tightened this to 0.01, which the PHS gives as the level that should not be exceeded if better supplies are available. It seems reasonable to require that supplies be made to meet that recommended standard. The standard for nitrates and nitrites is an important one based upon health dangers to infants, and these ions are not removed by standard treatment.

Other existing SWB-8 standards preserved in today's list include carbon chloroform extract (CCE), a measure of objectionable organic material; iron, which like the additional parameter of manganese for which there has been no standard causes problems of taste and of laundry color; methylene blue active substances, which cause taste problems and indicate recent sewage pollution; and phenols, which also cause taste problems. Cyanide (SWB-8 prescribes the same value of 0.025 mg/l as for aquatic life) is reduced as proposed in May to 0.01 mg/l on the basis of the recommended PHS standard. The existing oil standard has been quantified. The other concentrations discussed in this paragraph are based on PHS standards. The extent to which these parameters are reduced by ordinary treatment is disputed. The PHS says at least some of them are, and therefore implies that raw water need not meet such strict standards; the Green Book says otherwise, and for safety's sake these standards, mostly taken from present law, are here preserved.

As in the general standards, specific pesticide numbers are omitted. A new paragraph (c) is intended to guard against the presence of toxic substances for which numerical standards are not provided.

205 Restricted Use Standards. This Rule has been substantially revised to provide that aquatic life standards for various toxic materials need not be met since these waters are not protected for aquatic life. The standards are intended to assure against nuisance conditions, and, to protect other waters downstream, the water quality in restricted waters is required to meet the applicable effluent standards. The temperature standard has been modified in response to a suggestion from Commonwealth Edison Company, in order to avoid expensive cooling devices that are not necessary to the avoidance of nuisances or safety hazards.

206 Lake Michigan. Certain parameters taken from existing standards are preserved to require this high-quality lake to remain especially clean for esthetic and recreational purposes, in accordance with the important non-degradation policy. Similar provisions to protect other waters of unusually high quality have been omitted from the present draft for lack of evidence as to which waters are entitled to such protection. The Lake Michigan provisions establish the principle of special protection for

high-quality waters, and additional waters may be added in the future when the evidence so demands.

The Lake Michigan temperature standard recently adopted has been inserted.

207 Underground Waters. Protection of groundwater is of paramount importance. The provision has been amended to make clear it does not protect natural brines or deal with the problem of deep-well disposal except to assure protection of present or potential water supplies.

208 Nondegradation. This preserves the present prohibition of unnecessary degradation of waters presently of better quality than that required by the standards, recognizing that the standards represent not optimum water quality but the worst we are prepared to tolerate if economic considerations so require.

Part III contains water use designations. All waters are designated for general use except those in the restricted category, which has here been broadened in response to testimony to include waters whose flow is too low to support aquatic life. This should relieve the burden of treatment beyond the effluent standards for discharges to intermittent streams. Such extra effort is difficult to justify when it will not result in a satisfactory aquatic life because of insufficient flow. Since the publication of the proposed final draft we have also designated as restricted certain additional heavily industrial channels in the Chicago area. The evidence establishes that even with the most advanced treatment and with stormwater overflow control aquatic life standards for dissolved oxygen (and perhaps also ammonia) cannot be met in portions of the Chicago River System, and that meeting the aquatic temperature standards in these same areas, as well as in the adjacent section of the Des Plaines River, would require cooling towers costing tens of millions of dollars and produce doubtful benefits in terms of stream improvements. In the case of the North Shore Channel, where the evidence is that an intermediate oxygen level is achievable, we have prescribed it. We urge the Metropolitan Sanitary District to give serious consideration to such further measures, including in-stream aeration, as many offer promise of improving the quality of its restricted use waters.

Part IV. Several Rules in this Part were adopted January 6. Rules 404 and 405, earlier postponed, are adopted today.

404 Deoxygenating Wastes. This important section is an attempt, much modified in wording from that originally proposed, to restate the existing treatment requirements for BOD and suspended solids in a single document, with several deliberate changes. The task is unfortunately complicated by the fact that several different levels of secondary treatment are presently required for different waters and that new compliance dates must be set for any new requirements in order to allow time to build treatment works.

The basic requirement, which is close to that of existing law, is that all oxygen-demanding wastes shall meet standards of 20 mg/l of BOD and 25 of suspended solids. As we said in our January 6 opinion, prescribing the uniform use of readily available technology as a minimum serves to prevent local nuisances, to avoid premature exhaustion of assimilative capacity, and to further the established federal and state policy against degradation of clean water.

As proposed by the Agency (#R71-20), the July, 1972 date for compliance on intrastate streams (SWB-14) is made applicable to industry, as it was generally assumed to be before our decision in Borden Co. v. EPA, PCB 71-23 (May 24, 1971). Additional time is allowed for sources on certain rivers, including the Illinois and the Wabash, where present secondary requirements are somewhat more lenient, and for sources affected by the new dilution standard of Rule 401(a), but as in the case of the Mississippi River (#R 70-3, Jan. 6, 1971), the 20 and 25 standards appear readily attainable and represent the minimum of acceptable treatment. An exception, however, allows slightly less efficient treatment for smaller facilities in order to permit the use of trickling filters, which are relatively economical and efficient in the absence of sophisticated operation, except within the Metropolitan Sanitary District, where present law prescribes the 20 and 25 standard for all sources, presumably for the good reason that the density of sources is great enough to make large combined treatment facilities practicable and to discourage the use of less effective trickling filters. This exception also has precedent in our revised Mississippi River standard.

The secondary treatment requirement, as noted above, is a minimum standard representing ordinary good practice. In some cases, as we said in our January 6 opinion,

because of the low volume of the receiving stream or the large quantities of treated wastes discharged, meeting these (minimum) standards may not suffice to assure that the stream complies with water quality standards set on the basis of what is necessary to support various water uses. In such cases the very nature of water quality standards requires that additional measures be taken beyond those required by ordinary good practice to reduce further the discharge of contaminants to the stream.

Treatment requirements beyond secondary are based in substantial part upon this principle. Sanitary Water Board regulations, preserved by the Environmental Protection Act, require additional treatment as the ratio between stream flow and effluent volume (dilution ratio) becomes smaller. In general, BOD and solids effluent standards were set at 10 and 12, respectively, for dilution ratios of less than 2 to 1 and at 4 and 5 for less than 1 to 1.

The basic principle of this scheme is preserved in the revised regulations, with several important changes. First, we require the best available treatment (BOD 4, solids 5) for discharges to Lake Michigan, a high-quality body of water with low outflow rate that deserves maximum protection from possible contamination. The principal discharger to the Lake, the North Shore Sanitary District, is already committed to removing its effluents from the Lake altogether (see League of Women Voters v. NSSD, # 70-7, March 31 and June 26, 1971). The additional requirement of similar treatment before discharge to other high-quality waters, proposed May 12, is omitted for the time being pending identification of other waters entitled to such special protection.

The other changes we have made in this Rule are based primarily upon careful testimony presented by Dr. John Pfeffer of the Institute for Environmental Quality with respect to the need for and costs of treatment beyond secondary. Dr. Pfeffer's first point is that, given a base of secondary treatment,

the increased capital and operating and maintenance costs for achieving the next level of treatment with polishing ponds or microstrainers are not significant. Therefore, the requirement for effluent from an activated sludge process to satisfy the BOD₅ of 10 mg/l and organic suspended solids of 12 mg/l adds a relatively insignificant cost to wastewater treatment.

This testimony is supported by the testimony of consulting engineer Hjalmar Sundin that tertiary filtration will achieve an effluent meeting the 10-12 standard, that the cost of such treatment is quite "reasonable" as compared with that necessary to meet 4-5, and that "the economic breakpoint favors a 10 mg/l standard for BOD₅". See also the testimony of consulting engineer John Cormack with respect to the plants of the North Shore Sanitary District and filtration. With respect to the desirability of such treatment, Dr. Wesley Pipes urged the Board to extend the effluent requirements of 10 mg/l BOD and 12 mg/l solids to all discharges having a dilution ratio of less than five to one in order to reduce the stream BOD and protect against alterations in stream biota toward species more tolerant of pollution. As in the proposed final draft, we accept Dr. Pipes's suggestion because we believe the added protection worth the relatively small incremental cost of reducing effluents to this level when less than five volumes of dilution water are available. This revision did not raise much controversy.

Dr. Pfeffer's second point, supported once again by Sundin and Cormack and by numerous representatives of municipal treatment works, is that the incremental cost of reducing effluents beyond the 10-12 standard to meet 4 mg/l of BOD and 5 of solids is considerably greater. Moreover, he argues, in many cases these costs need not be incurred in order to maintain satisfactory stream quality. Using a modified form of the Streeter-Phelps equation, he demonstrates that, given certain conditions including a stream reaeration rate he says is not atypical for small streams with low dilution ratios, the dissolved oxygen standards we today set for aquatic life can often be met with effluents of 10 rather than 4 mg/l of BOD even in the total absence of dilution. The large sums spent for the last drop of removal, he concludes, may be spent for no apparent benefit. That substantial sums may be at stake is clear from Cormack's testimony that the North Shore Sanitary District can cut tertiary treatment costs at three plants from \$11,000,000 to \$3,000,000 by substituting filters under the Pfeffer proposal for the carbon absorption columns planned to meet the existing standard.

This argument stands uncontradicted on the record insofar as it pertains to dissolved oxygen. Dr. Pipes correctly points out that oxygen is not the sole purpose of the effluent standards, as sludge banks can cause a shift toward more pollution-tolerant life forms. Dr. Pfeffer responds that an effluent containing as little as 12 mg/l of suspended solids, finely divided and not readily settleable, should not result in sludge banks detrimental to aquatic life.

Dr. Pfeffer's recommendation, based on his above testimony, is that relief from the dilution-ratio requirement of 4 mg/l BOD and 5 of solids be provided upon proof in the individual case that stream standards for oxygen will not be violated. The Agency agrees. With modifications noted below, we adopt this recommendation. The purpose of treatment requirements beyond secondary is to assure satisfactory stream quality, not to impose an acceptable minimum of uniform treatment. The dilution ratio is a very rough guide to the necessity for such treatment. Based as it is upon the single relevant factor of available dilution water, it overlooks both the critical rate at which the stream accepts additional oxygen from the air and the important question of BOD concentration in the water that is to be used for dilution. For the relatively inexpensive increment to a 10-12 standard, and as an indicator of the need for proof that stream standards can be met without the expense of a 4-5 effluent, the dilution ratio is a useful tool. But, like standard emission factors in proof of air contaminant emissions, the naked dilution ratio should not automatically result in enormous expenditures for the best level of treatment if it can be shown that the water quality standards can be met at considerably less cost.

This conclusion is the more compelling in light of the fact that for many communities completion of facilities to achieve the 4-5 standard will by no means exhaust the need for water pollution control spending or assure that water quality standards will be met. As Dr. Pfeffer points out, the BOD₅ test principally measures the carbonaceous BOD and ignores the often delayed but eventual oxygen demand exerted by ammonia, to which we have directed our attention in the regulations adopted January 6. The ultimate nitrogenous oxygen demand of a waste containing a normal 20 mg/l of ammonia (measured as nitrogen) is 91 mg/l, nine times the carbonaceous BOD remaining after treatment to an effluent of 10 mg/l. We agree with Dr. Pfeffer that it makes little sense to spend money reducing carbonaceous BOD from 10 to 4 if the much greater nitrogenous demand is ignored. The State Water Survey has already found that oxygen standards in the Illinois River will not be met, even with advanced treatment, unless ammonia is oxidized before discharge in the largest plants. The same may be true in other streams. Inherent in Dr. Pfeffer's proposal, as several witnesses representing municipal dischargers expressly agreed, is that a considerable number of plants may be required to do something about ammonia in addition to those already subject to the January 6 effluent standards. Moreover, even if ammonia's oxygen demand is not exerted until sufficient dilution water downstream is available to protect stream oxygen, the ammonia itself may be toxic to fish and require treatment on that basis. Further, it is clear from the evidence that discharges from combined sewer overflows in many parts of the State may make it impossible to achieve the water quality standards even with the best available treatment at the plant.

In short, there may be higher priorities for water pollution control in many communities than the need for an effluent of 4 mg/l of BOD and 5 of suspended solids. Donald Matchke of the Cook County Clean Streams Committee and the Izaak Walton League, voicing the thoughts of a conservationist, expressed in an early hearing a concern over exactly this question of priorities, fearing lest the existing Sanitary Water Board requirements leave us with many expensive treatment plants and unsatisfactory waters:

We have to grapple with the gross problems that are contributing gross problems to the stream. These are the combined storm water and combined sewer overflows, and also the solids that escape from a treatment plant. . . . These are two main significant problems which seems to me they ought to be tops with us as far as solving rather than going for 98 percent treatment or four or five parts BOD as ultimate treatment in small receiving water courses. . . .

My one recommendation for tertiary treatment, outside of your own, which is nitrogen and phosphorus removal, plus chlorination, would be filtration of effluent because this contributes to a bottom sedimentation problem that is a common problem from one end of the state to the other. It is something that we can do relatively economically. We will take a BOD credit for doing it. . . . We have to grapple with the main problem, uncontrolled discharges of storm water and combined sewer overflows. Otherwise we are going to spend a great deal of money in the next five years and the tertiary treatment, and the comment made earlier, going to apply, there is going to be no benefit seen. The rivers are going to look just as bad unless we choose the priorities. They will look just as bad after tertiary treatment goes in.

There is always the contention that all of the suggested things should be done, that money is no object. But in light of the notorious difficulties of municipalities in raising enough money to finance the most necessary treatment projects, as well as the general undesirability of wasting money, we think it appropriate to reorder our priorities somewhat along the lines suggested by Mr. Matchke in order that limited funds will provide the maximum benefit in terms of actual stream improvement.

Accordingly, we have provided an exception from the effluent standard of 4 mg/l BOD and 5 solids upon proof that an effluent of 10 and 12 will suffice to achieve compliance with all applicable water quality standards. The burden is on the discharger to make that proof or to meet the stricter standard. Other sources discharging to the same stream must be taken into account, although the applicant is entitled to assume that others will bring themselves into compliance with their own effluent standards. We require proof that undesirable bottom deposits will not be caused, to satisfy the most serious question raised by Dr. Pipes; and that a program of ammonia control and of combined-sewer overflow control, where necessary, be provided at the time of applying for an exemption. What the new rule says is that it is the discharger's obligation to achieve satisfactory stream quality; he should demonstrate to the Agency how that is to be done.

The exemption does not apply to the three huge plants of the Metropolitan Sanitary District of Greater Chicago. Dr. Pfeiffer and his committee agreed it should not; the District itself testified to the enormous population equivalent load

discharged from those plants even after a high level of treatment; and sophisticated models presented by the District and others demonstrate that dissolved oxygen in the receiving streams cannot meet the 6 mg/l level even if the best treatment is provided. We cannot under the circumstances be content with less than the best in hopes that someday these channels may be upgraded to the status of an asset rather than a liability. Nor does the exception apply to Lake Michigan, where the high treatment requirement is imposed to protect the pristine esthetic quality of a special body of water.

An additional revision is based upon testimony that the present effluent requirements for low-flow streams (less than 1 to 1 ratio) effectively prohibit use of three-stage lagoons, which according to the Institute are the most dependable, economically reasonable method of advanced treatment for small communities that cannot afford expensive operators. Moreover, the lagoons are said to achieve a satisfactory reduction of the original sewage contaminants; much of what goes into the stream is likely to be algae. We have agreed to allow such lagoons in small communities to exceed the tighter effluent standards so long as water quality standards are met.

The timetables for compliance with this Rule are necessarily somewhat complex, as they attempt to adopt some existing deadlines and to prescribe new ones where new treatment requirements are imposed. No simplification appears practicable without either relaxing existing deadlines or giving insufficient time to meet new requirements. Individual timetables in the present regulations, many of which required compliance before now, are preserved by reference as the basis for enforcement purposes. The July, 1972 date set for secondary treatment on intrastate streams is restated. The December, 1973 date recently set for secondary treatment on the Mississippi River is retained, as is the 1977 date for advanced treatment in the large plants of the Metropolitan Sanitary District. Three years, a reasonable period according to the record in the Mississippi River case (R 70-3), is allowed for meeting all new requirements.

We have allowed until December 31, 1973 for compliance with most existing requirements for treatment beyond secondary. In many cases the original deadline was July, 1972, but according to Director Blaser of the Agency most communities have fallen behind that schedule, in large part because of the unavailability of federal aid funds. We have held that the absence of federal money is no excuse for disobeying the law, and we would not extend the deadline merely because people have missed it.

But we have already had several occasions, e.g., EPA v. City of Marion, #71-25 (Oct. 28, 1971), to observe that a new EPA technical release issue in the summer of 1971, just as a number of communities had prepared their plant for supplemental treatment, took many people by surprise in requiring the removal of algae from polishing lagoon effluent in order to assure meeting the effluent standards. On the basis of this surprise we have granted variances permitting six months' to a year's extension of the 1972 deadline for communities forced to draft new plans in midstream by this new policy, as in the Marion case itself. Moreover, our acceptance of Dr. Pfeffer's revised effluent standard permitting individual evaluation of the need to go beyond 10 mg/l of BOD and 12 of solids, if it is to be meaningful, must include a brief period of time in which communities affected may find out and demonstrate whether or not they can take advantage of the revised standard. We therefore allow until Sept. 1, 1972 for the submission of a program for achieving compliance, which must be approved by the Agency, and until the end of 1973 to complete construction. Because the communities affected are those previously under a 1972 deadline, we do not believe so much lead time is required as in the case of starting from scratch with a more stringent requirement, for which financial arrangements must be made. The Marion case gives some indication of the time that may be required to adjust to some of the changes made.

The fact that six months' delay in treatment plant completion may result from adoption of the Pfeffer proposal we do not believe to be reason enough for blazing full stream ahead on what may be a wrong course. The saving of money for more important uses, the more rapid attention to the critical problems of combined sewers and ammonia, and the fact that most communities were in default of the old deadlines all militate against keeping the old rules. In fact we suspect the December 1973 date is not far from when many communities would actually have complied with the old rules; retaining the paper requirement of July 1972 would not mean compliance by that date. If a more substantial delay were at issue, we should be likely to reject the Pfeffer proposal. Better a plant that is more costly than necessary than continued pollution. Six months' delay we can justify. But anyone who cannot prove his case for an exemption in that time should go ahead and build to meet the more stringent standard.

We need hardly say that the slippage in this program that makes that statement possible is a cause for grave concern, as we have pointed out in numerous opinions, e.g., City of Mattoon v. EPA, #71-8 (April 14, 1971), and that it must not be permitted to happen again. We set new dates because we have set new requirements, not because local officials have chosen to disobey the law. We will not tolerate a similar slippage

under the revised program. Substantial money penalties, as well as prohibition of additional connections, are a distinct possibility for communities that do not make diligent efforts to meet the new deadlines.

Paragraph (c) provides for averaging in accordance with the suggestion of the State Water Survey, based upon actual treatment plant observations under good operation.

405 Bacteria. Summer disinfection of bacterially contaminated effluents by various dates no later than July 1, 1972, has been required by the regulations for some time, with varying compliance dates and with more stringent requirements for discharges to waters designated for primary contact (swimming). The dangers of germs are also present to those who go to the waters for various purposes in winter, and the lower level prescribed for primary contact should be readily achievable wherever disinfection is practiced. The additional safety seems well worth the additional cost in chemicals.

Part V imposes reporting requirements similar to those of present law (SWB-6). Small changes have been made to provide that expensive monitoring need not be done for contaminants not likely to be found in an effluent. Access for Agency testing is required. The Agency asks us to add a requirement that records be kept. We invite a proposal for amendment to this effect on which a hearing may be held, as the suggestion was received too late to allow public comment.

Part VI. Rule 601, dealing with breakdowns and spills, was adopted January 6.

602 Combined Sewers and Treatment Plant Bypasses. It is generally acknowledged that one of the most serious water pollution problems throughout Illinois is that resulting from sewage flows far in excess of treatment or even sewer capacity during wet weather. Solution of this problem is necessary if all our other regulations are to result in visible improvement of water quality. Methods exist for capturing various levels of storm flows and of giving them various levels of treatment, some of the more sophisticated of which were described by Mr. Bryan of Rex Chainbelt at our Alton hearing. One plainly available solution, which is being put into effect by the North Shore Sanitary District, is retention of overflows for later routing through the regular treatment plant for complete treatment to meet the effluent standards. Occasional flows too large to be held altogether will be given primary treatment and disinfection before discharge. See *League of Women Voters v. North Shore Sanitary District*, #70-7, March 31 and June 26, 1971). A number of wet-weather control programs of other communities, many of them quite impressive, were described at length in the record.

Our initial proposal would have required that all such flows be treated to meet the effluent standards. The evidence is strong that the costs of complete treatment climb sharply and the benefits

fall off rapidly if control of the hundred-year storm is contemplated. Both the degree of treatment and the percentage of flow that should be treated are matters that we cannot determine across the board on the present record without regard to the needs of individual streams, and therefore we have modified the proposal.

What we adopt today is a restatement of existing law, which requires control of pollution from combined sewer overflows and treatment plant bypasses. The degree of treatment required and the amount of flow that must be captured are left to case-by-case determination by the Agency subject to certain guidelines based largely upon prior Agency interpretation of present law. The very polluttional "first flush," which the Agency is to define in each case according to the facts, must be given full treatment; at least ten times the dry weather flow must receive primary treatment and disinfection; and the Agency is to require such further treatment as may be necessary to prevent violation of water quality standards. Since this is essentially what was required by existing law to be done as to bypasses at the treatment plant itself at the same time the plant is upgraded to meet the BOD and solids effluent standards, we retain the requirement that treatment plant bypasses be corrected at the same time the plant itself is improved under Rule 404. Our original reading of the old regulations was that this same deadline applied to combined sewer overflow points distant from the treatment plant, but the Agency's interpretation, confirmed by a Sanitary Water Board communication to affected communities when the rules were first adopted, was that sewer overflows away from the plant were to be corrected "within ten years," or about 1977 or 1978. The Agency asks us to keep that distant date.

We recognize that those who relied in good faith on the more distant official interpretation cannot be penalized or expected to manage this difficult construction job within the next year and a half, much less by July 1972, as would be required if we adhered to our initial interpretation. We recognize the necessity to arrange for new financing in many cases and the logistic problems of constructing control facilities at numerous overflow points, some of them in highly congested areas, as was illustrated by the testimony of the City of Joliet. We also are aware that until the combined sewer problem is solved the waters will not be fit to use. There are several instances in the record of communities that, despite the late deadline, are already well on their way toward solution of their combined sewer problem. Our adoption of the Pfeffer standard for plant effluents should free up some funds already budgeted for use in dealing with overflows. We believe on the whole we can expect communities to achieve this control by the end of 1975, which allows over three and a half years. The

Metropolitan Sanitary District of Greater Chicago, which has a very large and very special problem, has demonstrated its need for somewhat longer period, but even as to that District we do not think it proper to extend the deadline beyond that originally set by the Sanitary Water Board. Four years have passed since the ten-year deadline was set, and the District is still in the planning stage. It is time something happened.

Rule 603 requires new sources to exercise care to limit damage to organisms that might otherwise be drawn into its intakes. An earlier provision limiting the percentage of a body of water that may be drawn through the condensers of new power plants or other like installations, in order to protect small aquatic life, has been deleted for want of evidence in the present record as to its reasonableness, as the Agency recommends.

Rule 604 on new connections to overloaded plants is being considered separately in #R 71-19.

Part VII contains minimum limits on discharges to sewers, designed to protect treatment works against harm that might cause violations of the effluent or water quality standards. We have added language suggested by Dr. Pipes to protect against hazards to sewage plant personnel and against the discharge of materials that will go through the plant without treatment and cause effluent violations. While local ordinances often provide for similar protection, one Sanitary District official pointed to the ineffectiveness of local enforcement and to the need for a state regulation.

The mercury limits of existing law (#R 70-5) are also included in this Part. We have also, with the concurrence of the Agency, modified the existing limit for cyanide discharges to sewers (SWB-5) to conform with the applicable ordinance of the Metropolitan Sanitary District. The limit of 2 mg/l of free cyanide is adequate on the record to protect sewer workmen; the requirement of proof that the treatment plant can handle the discharge is necessary and adequate to protect the receiving stream. We are asked to allow the permit to be sought by the discharger rather than by the local government, but the consent of the plant operator is essential. The evidence regarding Rockford shows this safeguard is workable in practice.

Part VIII incorporates existing requirements (SWB-19) for discharges of wastes from watercraft, with a new section requiring bilge or ballast discharges to meet general effluent standards. Special new provisions for better enforcement of the boating regulation are omitted for lack of adequate supporting evidence at present and may be considered separately in further hearings.

Part IX: Permits. As in earlier drafts, this part requires permits for existing and proposed effluent sources, both as an enforcement device and as a source of necessary information on which to base such important matters as future basin studies. Permits are to be issued only upon a showing of compliance with the law or the existence of a variance. Compliance with the law requires not only meeting the effluent standards but also a showing that the water quality standards of the receiving stream will not be jeopardized and that the nondegradation policy of federal and state law is not impaired.

We have accepted in large part the detailed language submitted by the Agency, which as administrator of the permit program has an intimate view of its own procedural needs. This language closely resembles that proposed for air pollution in #R 71-23. We have revised the Agency version to allow for limited testing under a construction permit; to require Agency notification if an application is incomplete; to allow permits where a variance has been granted; to omit the requirement of a bond; to leave the question of action under a permit pending appeal of a condition to individual cases; to require publication of new as well as revised design criteria; to provide for revocation by complaint rather than by Agency notice alone; and to eliminate the requirement of Board approval for Agency procedural rules.

Part X. Implementation Plan. This part requires the submission of programs for compliance by individual sources subject to new effluent limitations, by analogy to the practice of the old Air Pollution Control Board. This proposal has been generally applauded. Schedules may be approved by the Agency only if they conform to the timetables specified in the regulations and if the program appears adequate to achieve compliance.

Programs must be filed by July 1, 1972 to meet certain effluent standards adopted January 6; by September 1, 1972, in other cases in which compliance is due at the end of 1973; and by December 31, 1972 for later compliance dates. Interim dates for progress toward compliance are left to the individual case. Failure to adhere to an approved program is a violation for which penalties may be imposed.

Rule 1001 is the requirement of an annual status report from the Agency as proposed May 12. The extensive list of individual compliance dates, taken from existing regulations, is omitted. In most cases those dates are past; for enforcement purposes the original regulations may be used, and the presently applicable dates are more concisely stated in Part IV.

ORDER

1. CHAPTER 4 of the Rules and Regulations of the Pollution Control Board, entitled "Water Pollution," is hereby designated as Chapter 3.
2. The following new provisions are hereby added to the Rules and Regulations of the Illinois Pollution Control Board:

ILLINOIS POLLUTION CONTROL BOARD
RULES AND REGULATIONS

CHAPTER 3: WATER POLLUTION

PART I: INTRODUCTION

101 Authority.

Pursuant to the authority contained in Section 13 of the Environmental Protection Act, which authorizes the Board to issue regulations "to restore, maintain, and enhance the purity of the waters of this State in order to protect health, welfare, property, and the quality of life, and to assure that no contaminants are discharged into the waters without being given the degree of treatment or control necessary to prevent pollution", and to adopt water quality standards, effluent standards, standards for the issuance of permits, standards for the certification of sewage works operators, standards relating to water pollution episodes or emergencies, and requirements for the inspection of pollution sources and for monitoring the aquatic environment, the Board adopts the following rules and regulations.

102 Policy.

The General Assembly has found that water pollution "constitutes a menace to public health and welfare, creates public nuisances, is harmful to wildlife, fish, and aquatic life, impairs domestic, agricultural, industrial, recreational, and other legitimate beneficial uses of water, depresses property values, and offends the senses."

It is the purpose of these rules and regulations to designate the uses for which the various waters of the State shall be maintained and protected; to prescribe the water quality standards required to sustain the designated uses; to establish effluent standards to limit the contaminants discharged to the waters; and to prescribe additional regulations necessary for implementing, achieving and maintaining the prescribed water quality. These regulations were developed in close cooperation with the Federal Environmental Protection Agency in order that, consistent with Illinois law, they may also serve the purposes of the Federal Water Pollution Control Act.

103 Repeals.

These rules and regulations replace and supersede Rules and Regulations SWB-1, SWB-5 through SWB-15, and SWB-19, adopted by the Illinois Sanitary Water Board and continued in effect by Section 49 (c) of the Environmental Protection Act "Until repealed, amended, or superseded by regulations under this Act." Accordingly Rules and Regulations SWB-1, SWB-5 through ~~SWB-15~~, and SWB-19 are hereby repealed, except that any proceeding arising from any act committed before the effective date of the applicable provision of this Chapter shall be governed by the above listed regulations.

104 Definitions. As used in this Chapter, the following terms shall have the meanings specified [See additional definitions adopted Jan. 6, 1972]:

"Aquatic Life" means native populations of fish and other aquatic life;

"Dilution Ratio" means the ratio of the seven-day, once in ten years low flow of the receiving stream to the average dry weather flow of the treatment works for the design year.

"Institute" means the Illinois Institute for Environmental Quality;

"Interstate Waters" are all waters which cross or form part of the border between Illinois and other states;

"Intrastate Waters" are all the waters of Illinois which are not interstate waters;

"Marine Toilet" means any toilet on or within any watercraft;

"Modification" means

- 1) Any physical change in a treatment works which involves different or additional processes or equipment or which increases or decreases the capacity or efficiency of the treatment works;
or
- 2) any change in the number or location of points where effluent is discharged, directly or indirectly, to the waters; or
- 3) any change in any components of a sewer system which alters the quantity of wastewater capable of being conveyed, or which increases or decreases the quantity of wastewater capable of being discharged at overflow or bypass structures;
or
- 4) any increase in quantity or strength of a discharge from any wastewater source, unless such increase does not exceed an upper limit specifically allowed by an existing Permit granted by the Agency and does not involve any additional contaminants contained in standards set by this Chapter that are not itemized and approved in an existing Agency permit.

"Population Equivalent" is a term used to evaluate the impact of industrial or other waste on a treatment works or stream. One population equivalent is 100 gallons of sewage per day, containing 0.17 pounds of BOD₅ and 0.20 pounds of suspended solids. The impact on a treatment works is evaluated as the equivalent of the highest of the three parameters. Impact on a stream is the higher of the BOD₅ and suspended solids parameters;

"Primary Contact" means any recreational or other water use in which there is prolonged and intimate contact with the water involving considerable risk of ingesting water in quantities sufficient to pose a significant health hazard, such as swimming and water skiing;

"Public and Food Processing Water Supply" means any water use in which water is withdrawn from surface waters of the State for human consumption or for processing of food products intended for human consumption;

"Restricted Use" means certain designated waters which are not protected for aquatic life;

"Secondary Contact" means any recreational or other water use in which contact with the water is either incidental or accidental and in which the probability of ingesting appreciable quantities of water is minimal, such as fishing, commercial and recreational boating and any limited contact incident to shoreline activity;

"Underground Waters" means any waters of the State located beneath the surface of the earth;

"Watercraft" means every type of boat, ship or barge used or capable of being used as a means of transportation on water.

105 Analytical Testing (adopted January 6, 1972).

PART II. WATER QUALITY STANDARDS

This part of the rules and regulations concerning water pollution describes the water quality standards that must be met to maintain the specified beneficial uses. References to STORET numbers identify the specific parameter as defined in the STORET system Handbook published by the Federal Environmental Protection Agency.

201 Mixing Zones.

- (a) In the application of any of the rules and regulations in this Chapter, whenever a water quality standard is more restrictive than its corresponding effluent standard then an opportunity shall be allowed for the mixture of an effluent with its receiving waters. Water quality standards must be met at every point outside of the mixing zone. The size of the mixing zone cannot be uniformly prescribed. The governing principle is that the proportion of any body of water or segment thereof within mixing zones must be quite small if the water quality standards are to have any meaning. This principle shall be applied on a case-by-case basis to ensure that neither any individual

source nor the aggregate of sources shall cause excessive zones to exceed the standards. The water quality standards must be met in the bulk of the body of water, and no body of water may be used totally as a mixing zone for a single outfall or combination of outfalls. Moreover, except as otherwise provided in this Chapter, no single mixing zone shall exceed the area of a circle with a radius of 600 feet. Single sources of effluents which have more than one outfall shall be limited to a total mixing area no larger than that allowable if a single outfall were used.

In determining the size of the mixing zone for any discharge, the following must be considered:

1. The character of the body of water,
2. the present and anticipated future use of body of water,
3. the present and anticipated water quality of the body of water,
4. the effect of the discharge on the present and anticipated future water quality,
5. the dilution ratio, and
6. the nature of the contaminant.

- (b) In addition to the above, for waters designated for aquatic life (General Standards), the mixing zone shall be so designed as to assure a reasonable zone of passage for aquatic life in which the water quality standards are met. The mixing zone shall not intersect any area of any such waters in such a manner that the maintenance of aquatic life in the body of water as a whole would be adversely affected.

202 Stream Flows.

Except as otherwise provided in this Chapter with respect to temperature, the water quality standards in this Part shall apply at all times except during periods when flows are less than the average minimum seven day low flow which occurs once in ten years.

203 General Standards.

The General Standards listed below will protect the State's water for aquatic life, agricultural use, primary and secondary contact use, and most industrial uses, and ensure the aesthetic quality of the State's aquatic environment. Except as otherwise provided in this Chapter, all waters of the State shall meet the following standards:

- (a) Freedom from unnatural sludge or bottom deposits, floating debris, visible oil, odor, unnatural plant or algal growth, unnatural color or turbidity, or matter in concentrations or combinations toxic or harmful to human, animal, plant or aquatic life of other than natural origin.
- (b) pH (STORET number - 00400) shall be within the range of 6.5 to 9.0 except for natural causes.
- (c) Phosphorus (STORET number - 00665): Phosphorus as P shall not exceed 0.05 mg/l in any reservoir or lake, or in any stream at the point where it enters any reservoir or lake.
- (d) Dissolved oxygen (STORET number - 00300) shall not be less than 6.0 mg/l during at least 16 hours of any 24 hour period, nor less than 5.0 mg/l at any time.
- (e) Radioactivity:
 - (1) Gross beta (STORET number - 03501) concentration shall not exceed 100 pico curies per liter (pCi/l).
 - (2) Concentrations of radium 226 (STORET number - 09501) and strontium 90 (STORET number - 13501) shall not exceed 1 and 2 pico curies per liter respectively.
- (f) The following levels of chemical constituents shall not be exceeded:

CONSTITUENT	STORET NUMBER	CONCENTRATION (mg/l)
Ammonia Nitrogen (as N)	00610	1.5
Arsenic (total)	01000	1.0
Barium (total)	01005	5.0
Boron (total)	01020	1.0
Cadmium (total)	01025	0.05
Chloride	00940	500.
Chromium (total hexavalent)		0.05
Chromium (total trivalent)		1.0
Copper (total)	01040	0.02
Cyanide	00720	0.025
Fluoride	00950	1.4
Iron (total)	01046	1.0
Lead (total)	01049	0.1
Manganese (total)	01055	1.0
Mercury	71900	0.0005
Nickel (total)	01065	1.0
Phenols	32730	0.1
Selenium (total)	01145	1.0
Silver (total)	01075	0.005
Sulfate	00945	500.
Total Dissolved Solids	00515	1000.
Zinc	01090	1.0

- (g) Based on a minimum of five samples taken over not more than a 30-day period, fecal coliforms (STORET number - 31616) shall not exceed a geometric mean of 200 per 100 ml, nor shall more than 10% of the samples during any 30-day period, exceed 400 per 100 ml.
- (h) Any substance toxic to aquatic life shall not exceed one-tenth of the 48-hour median tolerance limit (48-hr. TLM) for native fish or essential fish food organisms.
- (i) Temperature (STORET numbers (F°) 00011 and (C°) 00010):
- (1) There shall be no abnormal temperature changes that may adversely affect aquatic life unless caused by natural conditions.
 - (2) The normal daily and seasonal temperature fluctuations that existed before the addition of heat due to other than natural causes shall be maintained.
 - (3) The maximum temperature rise above natural temperatures shall not exceed 5°F.

- (4) In addition, the water temperature at representative locations in the main river shall not exceed the maximum limits in the following table during more than one percent of the hours in the 12-month period ending with any month. Moreover, at no time shall the water temperature at such locations exceed the maximum limits in the following table by more than 3°F.

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC
Mississippi River (Wisc. Border to Iowa Border) (°F)	45°	45°	57°	68°	78°	85°	86°	86°	85°	75°	65°	52°
Mississippi River (Iowa Border to Alton Lock and Dam) (°F)	45°	45°	57°	68°	78°	86°	88°	88°	86°	75°	65°	52°
Mississippi River (So. of Alton Lock & Dam) (°F)	50°	50°	60°	70°	80°	87°	89°	89°	87°	78°	70°	57°
Ohio River (°F)	50°	50°	60°	70°	80°	87°	89°	89°	87°	78°	70°	57°
Wabash River & Its interstate Tributaries (°F)	50°	50°	60°	70°	80°	90°	90°	90°	90°	78°	70°	57°
Other Waters (°F)	60°	60°	60°	90°	90°	90°	90°	90°	90°	90°	90°	60°

Main river temperatures are temperatures of those portions of the river essentially similar to and following the same thermal regime as the temperatures of the main flow of the river.

- (5) The owner or operator of a source of heated effluent which discharges 0.5 billion British thermal units per hour or more shall demonstrate in a hearing before this Board not less than 5 nor more than 6 years after the effective date of these regulations or, in the case of new sources, after the commencement of operation, that discharges from that source have not caused and cannot be reasonably expected to cause significant ecological

damage to the receiving waters. If such proof is not made to the satisfaction of the Board appropriate corrective measures shall be ordered to be taken within a reasonable time as determined by the Board.

- (6) Permits for heated effluent discharges, whether issued by the Board or the Environmental Protection Agency, shall be subject to revision in the event that reasonable future development creates a need for reallocation of the assimilative capacity of the receiving stream as defined in the regulation above.
- (7) The owner or operator of a source of heated effluent shall maintain such records and conduct such studies of the effluents from such source and of their effects as may be required by the Environmental Protection Agency or in any permit granted under the Environmental Protection Act.
- (8) Appropriate corrective measures will be required if, upon complaint filed in accordance with Board rules, it is found at any time that any heated effluent causes significant ecological damage to the receiving stream.

204 Public and Food Processing Water Supply.

In addition to the General Standards, waters designated in Part III of this Chapter for public and food processing water supply shall meet the following standards at any point at which water is withdrawn for treatment and distribution as a potable supply or for food processing:

- (a) Waters shall be of such quality that with treatment consisting of coagulation, sedimentation, filtration, storage and chlorination, or other equivalent treatment processes, the treated water shall meet in all respects both the mandatory and the recommended requirements of the Public Health Service Drinking Water Standards - 1962.
- (b) The following levels of chemical constituents shall not be exceeded:

CONSTITUENT	STORET NUMBER	CONCENTRATION (mg/l)
Arsenic (total)	01000	0.01
Barium (total)	01005	1.0
Cadmium (total)	01025	0.01
Chlorides	00940	250
Carbon Chloroform Extract (CCE)	32005	0.2
Cyanide	00720	0.01
Iron (total)	01046	0.3
Lead (total)	01049	0.05
Manganese (total)	01055	0.05
Methylene Blue Active Substance (MBAS)	38260	0.5
Nitrates plus Nitrites as N	00630	10.0
Oil (Hexane-solubles or equivalent)	00550	0.1
Phenols	32730	0.001
Selenium (total)	01145	0.01
Sulfates	00945	250.
Total Dissolved Solids	00515	500.

- (c) Other contaminants that will not be adequately reduced by the treatment processes noted in paragraph (a) of this Rule shall not be present in concentrations hazardous to human health.

205 Restricted Use Standards.

Waters designated in Part III of this Chapter for Restricted Use shall meet the following standards:

- (a) Freedom from unnatural sludge or bottom deposits, floating debris, visible oil, odor, unnatural plant or algal growth, or unnatural color or turbidity.
- (b) pH (STORET number - 00400) shall be within the range of 6.0 to 9.0 except for natural causes.
- (c) Dissolved oxygen (STORET number - 00300) shall not be less than 3.0 mg/l during at least 16 hours in any 24-hour period, nor less than 2.0 mg/l at any time.
- (d) Based on a minimum of five samples taken over not more than a 30-day period, fecal coliforms (STORET number -31616) shall not exceed a geometric mean of 1,000 per 100 ml, nor shall more than 10% of the samples during any 30-day period exceed 2,000 per 100 ml.

- (e) Concentrations of other substances shall not exceed the applicable effluent standards prescribed in Part IV of this Chapter.
- (f) Temperature (STORET numbers - (°F) 00011 and (°C) 00010) shall not exceed 93° F (34°C) more than 5% of the time, or 100°F (37.8°C) at any time.

206 Lake Michigan.

The Waters of Lake Michigan shall meet the following standards in addition to the General and Public and Food Processing Water Supply Standards:

- (a) Dissolved oxygen (STORET number - 00300) shall not be less than 90% of saturation except due to natural causes.
- (b) pH (STORET number -00400) shall be within the range of 7.0 to 9.0 except for natural causes.
- (c) The following levels of chemical constituents shall not be exceeded.

CONSTITUENT	STORET NUMBER	CONCENTRATION (mg/l)
Ammonia Nitrogen	00610	0.02
Chloride	00540	12.0
Sulfate	00945	24.0
Phosphorus (as P)	00665	0.007
Total Solids (Dissolved)	00515	180.0

- (d) Based on a minimum of five samples taken over not more than a 30-day period, fecal coliforms (STORET number - 31616) shall not exceed a geometric mean of 20 per 100 ml.
- (e) Temperature (STORET numbers - (°F) 00011 and (°C) 00010):
 - (1) (A) All sources of heated effluents in existence as of January 1, 1971 shall meet the following restrictions outside of a mixing zone which shall be no greater than a circle with a radius of 1000 feet or an equal fixed area of simple form.

- (i) There shall be no abnormal temperature changes that may affect aquatic life.
- (ii) The normal daily and seasonal temperature fluctuations that existed before the addition of heat shall be maintained.
- (iii) The maximum temperature rise at any time above natural temperatures shall not exceed 3°F. In addition, the water temperature shall not exceed the maximum limits (°F.) indicated in the following table:

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
45	45	45	55	60	70	80	80	80	65	60	50

- (B) The owner or operator of a source of heated effluent which discharges 0.5 billion British Thermal Units per hour (BTU/HR.) or more shall demonstrate in a hearing before this Board not less than 5 nor more than six years after the adoption of this regulation, that discharges from that source have not caused and cannot be reasonably expected in future to cause significant ecological damage to the Lake. If such proof is not made to the satisfaction of the Board, backfitting of alternative cooling devices shall be accomplished within a reasonable time as determined by the Board.
- (C) The owner or operator of a source of heated effluent shall maintain such records and conduct such studies of the effluents from such sources and of their effects as may be required by the Environmental Protection Agency or in any permit granted under the Environmental Protection Act.
- (D) Backfitting of alternative cooling facilities will be required if, upon complaint filed in accordance with Board rules, it is found at any time that any heated effluent causes significant ecological damage to the Lake.

- (2) Any effluent source under construction as of January 1, 1971, but not in operation, shall meet all the requirements of Section 1 of this regulation and in addition shall meet the following restrictions:
- (A) Neither the bottom, the shore, the hypolimnion, nor the thermocline shall be affected by any heated effluent.
 - (B) No heated effluent shall affect spawning grounds or fish migration routes.
 - (C) Discharge structures shall be so designed as to maximize short-term mixing and thus to reduce the area significantly raised in temperature.
 - (D) No discharge shall exceed ambient temperatures by more than 20° F.
 - (E) Heated effluents from more than one source shall not interact.
 - (F) All reasonable steps shall be taken to reduce the number of organisms drawn into or against the intakes.
 - (G) Cleaning of condensers shall be accomplished by mechanical devices. If chemicals must be used to supplement mechanical devices, the concentration at the point of discharge shall not exceed the 96-hour TLm for fresh water organisms.
- (3) (A) No source of heated effluent which was not in operation or under construction as of January 1, 1971 shall discharge more than a daily average of 0.1 billion BTU/Hr.
- (B) Sources of heated effluents which discharge less than a daily average of 0.1 billion BTU/Hr. not in operation or under construction as of January 1, 1971 shall meet all requirements of sections 1 and 2 of this regulation.

207 Underground Waters.

The underground waters of Illinois which are a present or potential source of water for public or food processing supply shall meet the General and Public and Food Processing Water Supply standards except due to natural causes.

208 Nondegradation.

Waters whose existing quality is better than the established standards at the date of their adoption will be maintained in their present high quality. Such waters will not be lowered in quality unless and until it is affirmatively demonstrated that such change will not interfere with or become injurious to any appropriate beneficial uses made of, or presently possible in such waters and that such change is justifiable as a result of necessary economic or social development.

PART III: WATER USE DESIGNATIONS

This part of the rules and regulations concerning water pollution designates the water uses for which particular waters of the State are to be protected. Waters designated for specific uses must meet the most restrictive standards listed in Part II of this Chapter for any specified use, in addition to meeting the General Standards.

301 General Use Waters.

All waters of the State of Illinois are designated for general use except those designated as Restricted Use Waters.

302 Restricted Use Waters.

The following are designated as restricted use waters:

- (a) The Chicago Sanitary and Ship Canal;
- (b) The Calumet-Sag Channel;
- (c) The Little Calumet River from its junction with the Grand Calumet River to the Calumet-Sag Channel;

- (d) The Grand Calumet River;
- (e) The Calumet River;
- (f) Lake Calumet;
- (g) The South Branch of the Chicago River;
- (h) The North Branch of the Chicago River from its confluence with the North Shore Channel to its confluence with the South Branch;
- (i) The Des Plaines River from its confluence with the Chicago Sanitary and Ship Canal to the Interstate 55 bridge;
- (j) The North Shore Channel, except that dissolved oxygen in said Channel shall be not less than 5 mg/l during 16 hours of any 24 hour period, nor less than 4 mg/l at any time;
- (k) All waters in which, by reason of low flow or other conditions, a diversified aquatic biota cannot be satisfactorily maintained even in the absence of contaminants.

303 Public and Food Processing Water Supply.

All waters of Illinois are designated for Public and Food Processing Water Supply use except those designated as Restricted Use Waters, and except for the following:

- (a) The Chicago River;
- (b) The Little Calumet River.

PART IV: EFFLUENT STANDARDS
(see additional provisions
adopted Jan. 6, 1972)

404 Deoxygenating Wastes.

Except as provided in Rule 602 of this Chapter, all effluents containing deoxygenating wastes shall meet the following standards:

- (a) On and after July 1, 1972, or such earlier date as may have been specified in Rules and Regulations SWB-7 through SWB-15, no effluent shall exceed 30 mg/l of five-day biochemical oxygen demand (BOD₅) (STORET number 00310) or 37 mg/l of suspended solids (STORET number), except as follows:
 - (i) sources discharging to the Mississippi or Ohio Rivers shall comply with this paragraph (a) by December 31, 1973; and
 - (ii) sources discharging to the Wabash River may discharge up to 40 mg/l of BOD₅ and 45 mg/l of suspended solids until December 31, 1974.

- (b) On and after July 1, 1972, or such earlier date as may have been specified in Rules and Regulations SWB-7 through SWB-15, no effluent from any source whose untreated waste load is 10,000 population equivalents or more, or from any source discharging into the Chicago River System or into the Calumet River System, shall exceed 20 mg/l of BOD₅ or 25 mg/l of suspended solids, except as follows:
 - (i) sources discharging to the Mississippi or Ohio Rivers shall comply with this paragraph (b) by December 31, 1973; and
 - (ii) sources discharging to the Illinois or Wabash Rivers, or to the DesPlaines River downstream from its confluence with the Chicago Sanitary and Ship Canal, shall comply with this paragraph (b) by December 31, 1974.

- (c) On or after December 31, 1973, no effluent whose dilution ratio is less than five to one shall exceed 10 mg/l of BOD₅ or 12 mg/l of suspended solids, except as follows:

- (i) sources within the Metropolitan Sanitary District of Greater Chicago whose untreated waste load is 500,000 population equivalents or more shall comply with this paragraph (c) by December 31, 1977;
- (ii) sources whose dilution ratio is two to one or more but less than five to one shall comply with this paragraph (c) by December 31, 1974;
- (iii) sources employing third-stage treatment lagoons shall be exempt from this paragraph (c), provided all of the following conditions are met:
 - (A) the untreated waste load is less than 2500 population equivalents; and
 - (B) the source is sufficiently isolated that combining with other sources to aggregate 2500 population equivalents or more is not practicable; and
 - (C) the lagoons are properly constructed, maintained, and operated; and
 - (D) the effluent does not, alone or in combination with other sources, cause a violation of applicable water quality standards.
- (d) On or after December 31, 1974, no effluent discharged to the Lake Michigan basin shall exceed 4 mg/l of BOD₅ or 5 mg/l of suspended solids.
- (e) On or after December 31, 1977, no effluent from any source whose untreated waste load is 500,000 population equivalents or more shall exceed 4 mg/l of BOD₅ or 5 mg/l of suspended solids.
- (f) Except as provided in paragraphs (d) and (e) of this Rule 404, on or after December 31, 1973, no effluent whose dilution ratio is less than one to one shall exceed 4 mg/l of BOD₅ or 5 mg/l of suspended solids, except as follows:
 - (i) sources employing third-stage treatment lagoons shall be exempt from this paragraph (f), provided all of the conditions of subparagraph (c)(iii) of this Rule 404 are met.
 - (ii) Other sources not within paragraphs (d) and (e) of this Rule 404 shall be exempt from this paragraph

- (f) provided all of the following conditions are met:
- (A) the effluent shall not, alone or in combination with other sources, cause a violation of any applicable water quality standard; and
 - (B) the effluent shall not, alone or in combination with other sources, cause dissolved oxygen in the waters of the State to fall below 6.0 mg/l during at least 16 hours of any 24-hour period, or below 5.0 mg/l at any time; and
 - (C) the effluent shall not exceed 10 mg/l of BOD₅ or 12 mg/l of suspended solids; and
 - (D) on or before Sept. 1, 1972, the owner or operator of such source shall file with the Agency the Project Completion Schedule required by Rule 1002 of this Chapter. In addition to the requirements of Rule 1002, such schedule shall include a program for achieving compliance with the above conditions and with applicable water quality standards, including, but not limited to, dissolved oxygen, bottom deposits, ammonia nitrogen, and phosphorus, with particular reference to nitrogenous oxygen demand and to the control of stormwater overflows; and
 - (E) the Agency finds that the program will within the compliance dates otherwise applicable assure compliance with the conditions of this subparagraph.
- (g) Notwithstanding any other provision of this Rule, any source affected by this Rule 404 and relying in good faith upon the dilution rules of Rules and Regulations SWB-7 through SWB-15 to comply with applicable effluent standards need not comply with the dilution standard of Rule 401(a) until Dec. 31, 1974.
- (h) Compliance with the numerical standards in this Rule 404 shall be determined on the basis of 24-hour composite samples averaged over any consecutive 30-day period. In addition, no more than 5% of the samples collected shall exceed 2.5 times the numerical limits prescribed by this Rule.

405 Bacteria.

No effluent shall exceed 400 fecal coliforms per 100 ml after July 31, 1972, or such concentrations as may have been prescribed for earlier dates by SWB-7 through SWB-15.

PART V: MONITORING AND REPORTING

This part of the rules and regulations concerning water pollution prescribes requirements for monitoring, reporting and measuring contaminant discharges.

501 Reporting Requirements.

- (a) Every person discharging effluents to the waters of Illinois shall submit operating reports to the Agency at a frequency to be determined by the Agency. Such reports shall contain information regarding the quantity of influent and of effluent discharged, of wastes bypassed, and of combined sewer overflows; the concentrations of those physical, chemical, bacteriological and radiological parameters which shall be specified by the Agency; and any additional information the Agency may reasonably require.
- (b) Every person within this State who utilizes mercury or any of its compounds in excess of 15 pounds per year as Hg shall file with the Agency, on or before June 1, 1971 and annually thereafter, a report setting forth the nature of the enterprise; a list, by type and by quantity of mercury products and mercury derivatives produced, use in, and incidental to its processes, including by-products and waste products; the estimated concentrations and annual total number of pounds of mercury that will be discharged into the waters of the State or that will be discharged into any sewer system; and what measures are taken or proposed to be taken to reduce or to eliminate such discharges. (R 70-5 adopted March 31, 1971).

502 Effluent Measurement.

In order to facilitate the ability of the Agency to conduct its inspecting and investigating responsibilities as described in Section 4 (d) of the Act, all effluent discharged sewers, pipes or outfalls shall be designed or modified so that a sample of the effluent can be obtained at a point after the final treatment process and before discharge to or mixing with any waters of the State. All treatment works shall include such devices for taking samples and for measuring and recording effluent flow as the Agency may reasonably require.

PART VI: PERFORMANCE CRITERIA

601 (adopted Jan. 6, 1972)

602 Combined Sewers and Treatment Plant Bypasses.

- (a) The installation of new combined sewers is prohibited, except where sufficient retention or treatment capacity is provided to ensure that no violation of the effluent standards in Part IV of this Chapter occurs.

- (b) Excess infiltration into sewers shall be eliminated, and the maximum practicable flow shall be conveyed to treatment facilities. Overflows from sanitary sewers are expressly prohibited.
- (c) All combined sewer overflows and treatment plant bypasses shall be given sufficient treatment to prevent pollution or the violation of applicable water quality standards. Sufficient treatment shall consist of the following:
 - (1) All dry weather flows, and the first flush of storm flows as determined by the Agency, shall meet the applicable effluent standards;
 - (2) Additional flows, as determined by the Agency but not less than ten times the average dry weather flow for the design year, shall receive a minimum of primary treatment and disinfection with adequate retention time;
 - (3) Additional treatment, through retention and return of excess flows to the treatment plant or otherwise, shall be provided when required to achieve compliance with water quality standards.
- (d) Compliance with paragraph (c) of this Rule 602 shall be achieved on or before the following dates:
 - (1) All treatment plant bypasses, by the applicable date for improvement of treatment works under Part IV of this Chapter;
 - (2) All combined sewer overflows within the Metropolitan Sanitary District of Greater Chicago, by December 31, 1977;
 - (3) All other combined sewer overflows, by December 31, 1975.

603 Intake Structures.

New water intake structures on waters designated for General use, whose construction begins after the effective date of this Chapter, shall be so designed as to minimize harm to fish and to other aquatic organisms.

604 New Connections. (to be published separately)

PART VII: SEWER DISCHARGE CRITERIA

This part of the rules and regulations concerning water pollution places certain restrictions on the types, concentrations and quantities of contaminants which can be discharged into sewer systems in the State.

701 General Requirements.

Any wastes discharged to any sewer owned by any municipality, any county, or any sanitary district in the State of Illinois shall meet the following criteria in addition to any established by the municipality, county, or sanitary district itself:

- (a) liquids, solids, or gases which by reason of their nature or quantity may cause fire or explosion; or be injurious in any other way to sewers, treatment works structures or to the operation of the treatment works; or cause a safety hazard to the personnel operating the treatment works, or cause the effluent from the treatment works to violate applicable effluent standards are prohibited;
- (b) solid or viscous wastes which cause obstruction to the flow in sewers or other interference with the proper operation of any sewer or treatment works are prohibited.

702 Mercury (STORET number - 71900) (R 70-5 adopted March 31, 1971).

- (a) No effluent to any public sewer system shall include mercury or any of its compounds in excess of 0.0005 mg/l as Hg at any time.

- (b) The discharge of mercury shall be exempt from the limitations of paragraph (a) of this section if it meets all the following conditions:
 - (i) The total plant discharge totals less than five pounds as Hg in any year;
 - (ii) The discharge is to a public sewer served by a sewage treatment facility handling no less than 25,000 population equivalents;
 - (iii) The discharge does not alone, or in conjunction with other sources, cause the effluent from the sewage treatment plant to exceed 0.0005 mg/l as Hg; and
 - (iv) At least 95% of the mercury that would be discharged in the absence of control is removed from the effluent by December 1, 1971;
 - (v) After June 1, 1974 the exemptions provided in this subsection (b) shall terminate.

- (c) The discharge of wastes from medicinal or therapeutic use of mercury, exclusive of laboratory use, shall be exempt from the limitations of paragraphs (a) and (b) of this section if all the following conditions are met:
 - (i) The total plant discharge is less than one half pound as Hg in any year;
 - (ii) The discharge is to a public sewer system; and
 - (iii) The discharge does not, alone or in conjunction with other sources, cause the effluent from the sewer system or treatment plant to exceed 0.0005 mg/l of Hg.

- (d) No discharge of mercury shall be permitted which, alone or in combination with other sources, causes a violation of the water quality standard of 0.0005 mg/l of Hg.

703 Cyanide (STORET number - 00720).

- (a) No waste discharge to any public sewer system shall contain detectable levels of cyanide at any time except as permitted by Rule 703 (b).
- (b) Upon application by a county, municipality, sanitary district, or public utility and approval by the Agency, limited amounts of cyanide or cyanogen compounds may be permitted to be discharged to a county, municipal, sanitary district or public utility's sewer works. Total cyanide shall not exceed 10 mg/l provided any sample tested shall not release more than 2 mg/l of cyanide when tested at a pH of 4.5 and at a temperature of 150° for a period of 30 minutes. Such discharges shall be permitted only when the Agency has determined that no violation of the effluent criteria of this Chapter will result from such discharge.

PART VIII: DISPOSAL OF WASTES FROM WATERCRAFT

This part of the rules and regulations concerning water pollution regulates the disposal of wastes from watercraft.

801 Marine Toilets.

- (a) No person owning or operating a watercraft with a marine toilet shall use, or permit the use of, such toilet on the waters of this State, unless the toilet is equipped with facilities that will treat, hold, incinerate or otherwise handle the waste in a manner capable of preventing water pollution as described in paragraphs (c) and (d) of this section.
- (b) No person shall dispose of any sewage or waste water accumulated in a holding tank or any other container on a watercraft, in such a manner that the sewage or waste water reaches or may reach the waters of the State, except by pumpout to an operating sewage works which has been approved by the Agency or which operates under a permit issued by the Agency.
- (c) Acceptable pollution control devices are:
 - (1) Holding tanks which retain wastes from marine toilets for proper disposal pursuant to paragraph (b) of this Rule.
 - (2) Incinerating devices which will reduce to ash all sewage and toilet wastes produced on the watercraft. The ash from such devices is not to be disposed of in the waters of Illinois.

- (3) Any other device determined by the Agency to provide an effluent which meets the effluent criteria of this Chapter.

802 Contaminated Bilge or Ballast Waters.

No bilge or ballast water which fails to meet the effluent standards of this Chapter shall be discharged to the waters of the State.

PART IX: PERMITS

This part establishes basic rules for the issuance of permits for the construction, modification, and operation of treatment works, sewers, wastewater sources and other discharges.

901 Construction Permits

- (a) No person shall cause or allow the construction of any new treatment works, sewer, or wastewater source or cause or allow the modification of any existing treatment works, sewer, or wastewater source without a Construction Permit issued by the Agency, except as provided in paragraph (b).
- (b) Construction Permits shall not be required for the following:
 - (1) storm sewers that transport only land runoff; or
 - (2) any treatment works, sewer, or wastewater source that is designed and intended to serve a single building and eventually transport, treat, or discharge the sewage of 15 or less persons; or
 - (3) any treatment works, sewer, or wastewater source that, on the effective date of this Part, is being constructed or will be constructed under the authorization of a Permit already issued by the Agency or its predecessors; provided however, that all construction must be completed within three years from the effective date of this Part.

902 Operating Permits: New or Modified Treatment Works, Sewers and Wastewater Sources.

No person shall cause or allow the use or operation of any treatment works, sewer, or wastewater source for which a Construction Permit is required under Rule 901 without an Operating Permit issued by the Agency, except for such testing operations as may be authorized by the Construction Permit.

903 Operating Permits: Existing Treatment Works and Wastewater Sources

- (a) No person shall cause or allow the use or operation of any treatment works or wastewater source after December 31, 1972 without an Operating Permit issued by the Agency, except as provided in paragraphs (b), (c) and (d).

- (b) Operating Permits are not required for treatment works and wastewater sources that are designed and intended to serve a single building and eventually treat or discharge the sewage of 15 or less persons.
- (c) Operating Permits for the following classes of treatment works and wastewater sources will be required by the following dates:
 - (1) Any wastewater source consisting solely of non-contact cooling water, by June 30, 1973; and
 - (2) Treatment works receiving wastewater with a population equivalent of 10,000 or more with at least 60% of the loading being sewage, by December 31, 1973; and
 - (3) Treatment works receiving wastewater with a population equivalent of under 10,000, with at least 60% of the loading being sewage, by June 30, 1974.
- (d) If necessary to prevent an unmanageable workload, the Agency may extend the dates by which Operating Permits are required under paragraphs (a) and (c) for a period not to exceed four months. The Agency must notify the persons affected and the Board of the extension at least four months before the dates set forth in paragraphs (a) and (c).

904 Operating Permits: Existing Sewer Systems

- (a) No person who owns and operates an interconnected system of sanitary sewers and/or combined sewers consisting of more than one mile of pipe shall cause or allow the use or operation of part or all of that system of sewers after December 31, 1974, without an Operating Permit issued by the Agency, except as provided in paragraph (b).
- (b) Operating Permits for any system of sewers tributary to treatment works designed to treat wastewater having a population equivalent of 25,000 or less will not be required until March 31, 1975.

905 Operating Permits: Existing Discharges to Sewers

[Reserved for use in connection with Part VII]

906 Joint Construction and Operating Permits

In cases where the Agency determines that a proposed treatment works, sewer, or wastewater source is sufficiently standard so as to obviate the need for separate Construction and Operating Permits, the Agency may issue a Joint Construction and Operating Permit.

907 Experimental Permits

- (a) In order to promote the development of water pollution control technology, the Agency may issue Experimental Permits for treatment processes or techniques that do not satisfy the Standards for Issuance set forth in Rule 921, provided that the applicant submits clear, cogent and convincing proof that the process or technique has a reasonable and substantial chance for success.
- (b) The existence of a valid Experimental Permit shall constitute a prima facie defense to any action brought against the Permittee for a violation of this Chapter, but only to the extent that such action is based on the failure of the process or technique, during the period of validity of the Permit, to meet the effluent limitations or water quality standards of this Chapter.

908 Former Permits

The issuance of any Permit by the Agency or any predecessor prior to the effective date of this Part will not excuse compliance with the requirements for obtaining Operating Permits as set forth in Rules 903, 904 and 905.

911 Applications - Contents

- (a) All applications for any Permit required under this Part shall contain, where appropriate, the following information and documents:
 - (1) a complete description of the volume and nature of the wastewater influent and effluent to be transported, treated or discharged, including a statement as to the presence or absence of all contaminants for which effluent or water quality standards are set by this Chapter; and
 - (2) a description of the present condition of the receiving body of water and the effect of the wastewater on such receiving body of water; and
 - (3) a statement as to any projected changes in the

volume or nature of the wastewater which the applicant desires to have included within the terms of the Permit; and

- (4) a description of the geographic location of the facility or source, and its interrelation with any existing or proposed treatment works, sewer, or wastewater source which will transport, treat, or discharge the same wastewater; and
 - (5) plans and specifications, prepared by a registered professional engineer, fully describing the design, nature, function and interrelationship of each individual component of the facility or source; and
 - (6) a statement identifying and justifying any departure from current design criteria promulgated by the Agency.
- (b) The Agency may adopt procedures requiring such additional information as is necessary to determine whether the treatment works, sewer, or wastewater source will meet the requirements of the Act and this Chapter.
 - (c) The Agency may prescribe the form in which all information required under this Rule shall be submitted.

912 Applications - Signatures and Authorizations

- (a) All Permits applications shall be signed by the owner of the treatment works, sewer, or wastewater source or the owner's duly authorized agent, and shall be accompanied by evidence of authority to sign the application.
- (b) Permit applications for sewer construction or modification shall be accompanied by signed statements from the owners of all intermediate receiving sewers and the receiving treatment works certifying that their facilities have adequate capacity to transport and/or treat the wastewater that will be added through the proposed sewer without violating any provisions of the Act and this Chapter.

913 Applications - Registered or Certified Mail

All Permit applications shall be mailed or delivered to the appropriate address designated by the Agency. Any application or revised application sent by mail shall be sent by registered or certified mail, return receipt requested.

Applications which are hand-delivered shall be delivered to and receipted for by any authorized person employed in the Permit Section of the Agency's Division of Water Pollution Control.

914 Applications - Time to Apply

Any person required to have a Permit must file an application with the Agency at least 90 days before the date on which the Permit is required.

915 Applications - Filing and Final Action by Agency

- (a) An application for Permit shall not be deemed to be filed until the Agency has received, at the designated address, all information, documents, and authorizations in the form and with the content required by Rules 911-913 and related Agency procedures. Provided, however, that if the Agency fails to notify the applicant within 30 days after the filing of a purported application that the application is incomplete and of the reason the Agency deems it incomplete, the application shall be deemed to have been filed as of the date of such purported filing. The applicant may treat the Agency's notification that an application is incomplete as a denial of the application for purposes of review.
- (b) If the Agency fails to take final action, by granting or denying the Permit as requested or with conditions, within 90 days from the filing of the application, the applicant may deem the Permit granted for a one-year period commencing on the 91st day after the application was filed.
- (c) Any applicant for a Permit may waive the requirement that the Agency must take final action within 90 days from the filing of the application
- (d) The Agency shall send all notices of final action by registered or certified mail, return receipt requested.
- (e) The Agency shall be deemed to have taken final action on the date that the notice is mailed.

921 Standards for Issuance

The Agency shall not grant any Permit required by this Part, except an Experimental Permit under Rule 907, unless the applicant submits adequate proof that the treatment works, sewer, or wastewater source:

- (a) will be constructed, modified, or operated so as not to cause a violation of the Act or of this Chapter, or has been granted a variance under Title IX of the Act; and
- (b) either conforms to the design criteria promulgated by the Agency under Rule 931, or is based on such other criteria which the applicant proves will produce consistently satisfactory results; and
- (c) conforms to all conditions contained in the Construction Permit, where applicable; and
- (d) if subject to a future compliance date, the applicant has an approved Project Completion Schedule in accordance with the provisions of Rule 1002.

922 Duration of Permits

- (a) Construction Permits: Construction Permits for sewers and wastewater sources shall require that construction be completed within two years. Construction Permits for treatment works shall require that construction be completed within three years. In situations where the magnitude and complexity of the project require it, the Agency may issue a Construction Permit requiring completion within a period not to exceed five years.
- (b) Operating Permits: All Operating Permits other than those issued under Rule 902 for newly constructed sewers shall have a duration not to exceed five years. The Agency may issue Operating Permits having a duration as short as one year in order to facilitate basin planning, to coordinate Operating Permits with future compliance deadlines and to maintain intensive control over new or experimental processes.

923 Conditions

In addition to specific conditions authorized under this Part, the Agency may impose such conditions in any Permit issued pursuant to this Part as may be necessary to accomplish the purposes of the Act or this Chapter, provided such conditions are not inconsistent with this Chapter.

924 Appeals from Conditions in Permits

An applicant may consider any condition imposed by the Agency in a Permit as a refusal by the Agency to grant a Permit, which shall entitle the applicant to appeal the Agency's decision to the Board pursuant to Section 40 of the Act.

925 Permit No Defense

Except as provided in Rule 907, the issuance and possession of a Permit under this Part shall not constitute a defense to a violation of the Act or this Chapter, except for construction or operation without a permit.

931 Design, Operation and Maintenance Criteria

(a) The Agency may adopt procedures which set forth criteria for the design, operation, and maintenance of treatment works, sewers, and wastewater sources. These procedures shall be revised from time to time to reflect current engineering judgment and advances in the state of the art.

(b) Before adopting new criteria or making substantive changes to any criteria adopted by the Agency, the Agency shall:

- (1) publish a summary of the proposed changes in the Board Newsletter or a comparable publication, at the Agency's expense; and
- (2) provide a copy of the full text of the proposed changes to any person who in writing so requests; and
- (3) defer adoption of the changes for 45 days from the date of publication to allow submission and consideration of written comments on the proposed changes.

941 Modification of Permits

Any permit issued by the Agency may be modified to make its provisions compatible with any new regulations adopted by the Board.

942 Permit Revocation

Violation of the conditions of a Permit issued under the provisions of this Part shall be grounds for revocation by the Agency of the Permit, in addition to other sanctions provided by the Act. Such sanctions shall be sought by filing a complaint with the Board.

951 Approval of Federal Permits

The Agency shall not approve any effluent discharge for the purposes of any federal permit unless that discharge is in compliance with all provisions of the Act and this Chapter, or has been granted a variance under Title IX of the Act.

961 Hearings

- (a) The Agency may conduct hearings, prior to issuing a Permit pursuant to this Part, to determine whether an applicant has submitted proof that the treatment works, sewer, or wastewater source is or will be in compliance with the Act and this Chapter.
- (b) The Agency shall adopt procedural regulations for the conduct of such hearings, which regulations shall be effective upon filing with the Secretary of State. Revisions to such procedural regulations adopted by the Agency pursuant to this paragraph shall take effect in like manner.

971 Procedures

In addition to procedures specifically authorized under this Part, the Agency may adopt and promulgate all procedures reasonably necessary to perform its duties and responsibilities under this Chapter. Such procedures, and revisions thereto, shall not become effective until filed with the Index Division of the Office of the Secretary of State as required by "An Act concerning Administrative Rules," approved June 14, 1951, as amended.

PART X: IMPLEMENTATION PLAN

This part requires an annual waste discharges report to be prepared by the Environmental Protection Agency and provides for the filing and approval of programs to meet future deadlines.

1001 Waste Discharge Report.

The Agency shall annually prepare and submit to the Board a Waste Discharge Report which lists the waste discharges in the State, describes the type, quantity and concentrations of the various contaminants being discharged, and describes the existing and planned treatment controls and the scheduled dates for completion of treatment improvements.

1002 Project Completion Schedule.

- (a) Any person who owns or operates any sewer treatment works or wastewater source that requires modification or additional controls to meet any applicable effluent standard contained within this Part shall file a Project Completion Schedule with the Agency. The Project Completion Schedule shall include a description of the wastewater source, the contaminants to be controlled, the additional controls or treatment required, and a time schedule for the project's completion which must meet the applicable deadlines, as well as interim dates by which various increments of the proposed compliance program shall be completed, such as dates when plans and specifications shall be completed, dates when contracts will be awarded, dates for equipment delivery, and dates for the commencement of construction. The approval by the Agency of a Project Completion Schedule and compliance therewith shall constitute a prima facie defense to any enforcement action respecting the requirements whose compliance the program is designed to achieve, during the period of the program.
- (b) Project Completion Schedules shall be filed in accordance with the following timetable:
 - (i) For compliance with Rules 407 and 408, the schedule shall be filed no later than July 1, 1972;
 - (ii) In other cases in which compliance with effluent standards is required by December 31, 1973, the schedule shall be filed no later than Sept. 1, 1972;

- (iii) Where compliance with effluent standards is required at a date later than December 31, 1973, the schedule shall be filed no later than December 31, 1972.
- (c) Failure to adhere to an approved compliance schedule shall constitute a violation of this Part for which appropriate sanctions may be sought in accordance with the Act.

I, Christan Moffett, Clerk of the Pollution Control Board, certify that the Board adopted the above Opinion and Order this 7th day of MARCH, 1972, by a vote of 4-0.

Christan Moffett