

**PEOPLE OF THE STATE OF ILLINOIS, Plaintiff-Appellee, and
PEOPLE OF THE STATE OF MICHIGAN, Intervening Plain-
tiff-Appellee, v. CITY OF MILWAUKEE, THE SEWERAGE COM-
MISSION OF THE CITY OF MILWAUKEE, and THE METRO-
POLITAN SEWERAGE COMMISSION OF THE COUNTY OF
MILWAUKEE, Defendant-Appellants**

No. 77-2246

UNITED STATES COURT OF APPEALS, SEVENTH CIRCUIT

**599 F.2d 151; 1979 U.S. App. LEXIS 15144; 13 ERC (BNA) 1049; 9
ELR 20347**

**May 24, 1978, Argued; After Supplemental Briefing October 12, 1978,
Submitted
April 26, 1979, Decided**

Elwin J. Zarwell, Milwaukee, Wis., for defendants-appellants.

Thomas J. Emery, Asst. Atty. Gen., Lansing, Mich., Joseph V. Karaganis, Chicago, Ill., William J. Scott, Atty. Gen., Chicago, Ill., for plaintiff-appellee.

Before FAIRCHILD, Chief Judge, TONE, Circuit Judge, and HARPER, Senior District Judge. *

* The Honorable Roy W. Harper, Senior District Judge of the United States District Court for the Eastern and Western Districts of Missouri, is sitting by designation.

TONE, Circuit Judge

[*154] The State of Illinois filed this action under the federal common law of nuisance to enjoin the City of Milwaukee and the Sewerage Commissions of the City and County of Milwaukee ¹ from discharging raw sewage and inadequately treated sewage into Lake Michigan. ² Illinois alleged and undertook [*155] to prove at trial that the sewage contains pathogens, disease-causing viruses and bacteria, which are transported by currents into parts of the lake that [**2] lie within Illinois, where they present a substantial threat to the health of Illinois residents, and also that the sewage contains nutrients that accelerate eutrophication of the lake. The State of Michigan intervened as a plaintiff on the eutrophication issue only. After a four month trial, the district court found that plaintiffs had proved their allegations and entered a judgment requiring defendants to cease discharging raw sewage and to treat sewage before discharging it in compliance with effluent limitations more stringent than the minimum limitations imposed pursuant to the Federal Water Pollution Control Act, 33 U.S.C. § 1251, Et seq. Defendants appeal, raising the issues of (1) whether the relief available in an action based on the federal common law of nuisance is greater than that available under the federal

statute, and (2) whether the evidence in this case is sufficient to support the relief granted. As to the first question, we hold that the statute does not limit the relief that may be granted; as to the second, we hold that the evidence is sufficient to support only some of the relief granted and therefore affirm in part and reverse in part. [**3]

1 For practical purposes, the two commissions may be regarded as one. See also n. 33, *Infra*. The chief administrative officer for both is the same man; he also serves as the secretary for both commissions. The county commission has no employees other than the chief administrative officer and secretary referred to and uses the staff of the city commission when necessary. In this opinion we differentiate between the two only when the difference is significant.

2 Illinois also named three other Wisconsin cities as defendants in this case: Kenosha, Racine, and South Milwaukee. They are not involved in this appeal.

After judgment was entered the County of Milwaukee moved to intervene as an indispensable party under Rule 19(b), Federal Rules of Civil Procedure (Fed.R.Civ.P.). The motion was denied; this court affirmed, without written opinion. The Supreme Court denied certiorari. --- U.S. ---, 99 S. Ct. 1423, 59 L. Ed. 2d 634 (1979).

This litigation began with Illinois' petition for [**4] leave to file an original action in the Supreme Court of the United States, which was denied, *Illinois v. Milwaukee*, 406 U.S. 91, 92 S. Ct. 1385, 31 L. Ed. 2d 712 (1972). Illinois then filed suit in the United States District Court for the Northern District of Illinois. Defendants' motions to dismiss for lack of *In personam* jurisdiction and improper venue were denied, *Illinois v. Milwaukee*, 4 E.R.C. 1849 (N.D.Ill.1972); later, defendants' motions to dismiss for failure to state a claim on which relief could be granted were also denied, *Illinois v. Milwaukee*, 366 F. Supp. 298 (N.D.Ill.1973).

In due course the case proceeded to trial, at the conclusion of which the judge orally and ex-temporaneously announced his findings of fact and conclusions of law. The facts and the relief granted will be described later, as they become pertinent to the issues discussed.

Defendant-appellants' position is supported by the briefs of three *Amici curiae* : the State of Wisconsin, the National League of Cities, and the United States Conference of Mayors. In addition, the United States has filed a brief *Amicus curiae* in which it takes no position on the merits [**5] but supports the arguments of Illinois and Michigan that the federal common law of nuisance is not preempted or limited by federal legislation.

After oral argument this court ordered supplemental briefing addressed to (1) the elements required to be proved to establish a claim for a common law nuisance, (2) identification of particularized findings of the district court considered material to those elements and record references to the evidence supporting those findings, and (3) identification of evidence in the record supporting the reasonableness and necessity of the relief granted by the trial court. The parties filed extensive supplemental briefs, and each side subsequently filed a reply to the other's supplemental brief, as a consequence of which submission of the case was delayed until October 1978.

I.

Objections to the Forum

Defendants raise three arguments that may be broadly characterized as objections to the forum. First, defendants contend that they have committed no "tortious act within" the State of Illinois as that

phrase is used in the Illinois "long-arm" statute, § 17 of the Illinois Civil Practice Act, Ill.Rev.Stat. ch. 110, § 17 (1977), and therefore service [**6] of process was ineffective and the United States District Court sitting in Illinois could not exercise personal jurisdiction over them. See Rule 4(e), Federal Rules of Civil Procedure (Fed.R.Civ.P.). Second, defendants contend that their contacts with Illinois are insufficient to meet the minimum required by *International Shoe v. Washington*, 326 U.S. 310, 66 S. Ct. 154, [*156] 90 L. Ed. 95 (1945). Third, defendants contend that even if the court had personal jurisdiction, venue was improper. Judge Bauer, then a district judge, rejected these contentions in denying defendants pretrial motions to dismiss in *Illinois v. Milwaukee*, supra, 4 E.R.C. at 1850, and we do likewise.

For purposes of § 17 "a tort is committed in the place where the injury occurs." *McBreen v. Beech Aircraft Corp.*, 543 F.2d 26, 28 (7th Cir. 1976). It seems beyond dispute that injury to the plaintiff in this case occurred in Illinois. Cf. *Ohio v. Wyandotte Chemicals Corp.*, 401 U.S. 493, 500, 91 S. Ct. 1005, 28 L. Ed. 2d 256 (1971).

As to the second contention, the critical issue is whether it is fair and reasonable to require the defendants to defend [**7] in Illinois. See *Kulko v. Superior Court of California*, 436 U.S. 84, 92, 98 S. Ct. 1690, 56 L. Ed. 2d 132 (1978); *Telco Leasing, Inc. v. Marshall County Hospital*, 586 F.2d 49 (7th Cir. 1978).³ Each year defendants dump into Lake Michigan millions of gallons of pathogen-containing sewage, which the district court found is sometimes carried into Illinois waters and presents a substantial threat of harm to Illinois residents. Under such circumstances, we do not think it unfair or unreasonable to require the defendants to defend their conduct in a federal forum located within the State of Illinois. See *Ohio v. Wyandotte Chemicals Corp.*, supra, 401 U.S. at 500, 91 S. Ct. 1005.

3 If Congress had chosen to authorize nationwide service of process, no minimum contacts issue would be raised. See, e. g., *Fitzsimmons v. Barton*, 589 F.2d 330, 333 (7th Cir. 1979); *Mariash v. Morrill*, 496 F.2d 1138, 1143 & n. 6 (2d Cir. 1974). Congress has not done so and Fed.R.Civ.P. 4(e) makes jurisdiction dependent on the long-arm statute or rule of court of the state in which the district court is held; therefore we are required to determine whether defendants' contacts with Illinois are sufficient to support the exercise of In personam jurisdiction.

[**8] Defendants argue that venue was improper for three different reasons: (1) the venue provision of the Federal Water Pollution Control Act Amendments of 1972, Pub.L. No. 92-500, 86 Stat. 816, requires that the suit be filed in the district where the source is located, (2) all "nuisance" actions are "local" and therefore must be filed in the district where the source is located, and (3) all actions against a municipal corporation are "local" and therefore must be filed in the district where the municipal corporation is located. The first argument is quickly disposed of, for the venue provision of the statute is by its terms inapplicable. That provision is relevant only to "action(s) respecting a violation . . . of an effluent standard or limitation . . . brought under (§ 505) . . ." § 505(c)(1). Here, plaintiff's action is based on the federal common law of nuisance. Therefore the relevant venue provision is 28 U.S.C. § 1391(b), which permits suit in either the "judicial district where all defendants reside, or in which the claim arose . . ." *Illinois v. Milwaukee*, supra, 406 U.S. at 108 n.10, 92 S. Ct. at 1395 n.10.

Whatever may be the significance [**9] of state law in determining whether an action is "transitory" or "local" in other contexts,⁴ we agree with the district court, *Illinois v. Milwaukee*, supra, 4 E.R.C. at 1850, that the language in the Supreme Court's opinion in *Illinois v. Milwaukee*, supra, 406

U.S. at 108 n.10, 92 S. Ct. 1385, indicates that an action against a municipal corporation and based on the federal common law of nuisance may be filed, pursuant to 28 U.S.C. § 1391(b), in either the district where all the defendants reside or the district where the claim arose, without regard to any otherwise applicable state venue statutes or common law rules. In this case, the claim arose in the Northern District of [*157] Illinois, where the injury was suffered, and therefore venue was proper.

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4 See, e. g., *French v. Clinchfield Coal Co.*, 407 F. Supp. 13, 16-17 n. 11 (D.Del.1976) (Caleb Wright, J.); *Hasburgh v. Executive Aircraft Co.*, 35 F.R.D. 354, 355 (W.D.Mo.1964); See generally 1 Moore's Federal Practice § 0.142(2. 1), 1368-1369 & nn. 40-41 (1978); Wright, *Law of Federal Courts* 158 (2d ed. 1970); Wright, Miller & Cooper, 15 *Federal Practice and Procedure* § 3822 (1976).

[**10]

5 There is some debate as to whether there ought to be a uniform rule of law in federal courts governing the question of whether an action is "local" or "transitory." See, e. g., *French v. Clinchfield*, supra, 407 F. Supp. at 16-17 n. 11; Wright, Miller & Cooper, *Supra*, § 3822 at 129-130; 1 Moore's Federal Practice, supra, at 1368-1369 & n. 40. *Illinois v. Milwaukee*, supra, 406 U.S. 108 n. 10, 92 S. Ct. 1385, can also be understood as resolving this debate in favor of a uniform federal rule, at least in federal common law nuisance actions, and as indicating that such actions should be treated as "transitory." Under either interpretation of the language, § 1391(b) is applicable and venue was proper.

II.

Effect of Federal Statutes on Federal Common Law of Nuisance

In *Illinois v. Milwaukee*, supra, 406 U.S. 91, 92 S. Ct. 1385, 31 L. Ed. 2d 712, the Court denied Illinois' petition for leave to file an original action under 28 U.S.C. § 1251(a)(1) ⁶ on the ground that "States," as used in that provision, does not include political [*11] subdivisions. *Id.* at 98, 92 S. Ct. 1385. The Court also declined to exercise its jurisdiction under 28 U.S.C. § 1251(b) (3), ⁷ since the issues raised in the complaint were governed by federal common law, and therefore an appropriate district court would have jurisdiction of the case under 28 U.S.C. § 1331(a). ⁸ After reviewing the provisions of the Federal Water Pollution Control Act, 62 Stat. 1155, ⁹ and other federal legislation regulating pollution of interstate waters, the Court held that federal common law had not been preempted, but noted "that new federal laws and new federal regulations may in time pre-empt the field of federal common law of nuisance." *Id.* at 107, 92 S. Ct. at 1395. Shortly after that decision Congress adopted the comprehensive Federal Water Pollution Control Act Amendments of 1972, Pub.L. No. 92-500, 86 Stat. 816. In 1977 Congress further amended the Act. Pub.L. No. 95-217, 91 Stat. 1566. Defendants concede that neither the 1972 nor the 1977 amendments preempt the federal common law of nuisance. Wisconsin's brief *Amicus curiae*, however, argues that the comprehensive statutory [*12] scheme preempts the common law. The brief of the United States as *Amicus curiae* argues to the contrary. Since the issue concerns our jurisdiction, we are obliged to consider it. See, e. g., *American Meat Institute v. EPA*, 526 F.2d 442, 448-449 (7th Cir. 1975). In addition, we consider whether the statute, even if it does not preempt the federal common law, limits the relief that may appropriately be granted or otherwise influences the principles to be applied in this action.

6 That provision states,

The Supreme Court shall have original and exclusive jurisdiction of: (1) All controversies between two or more States;

7 That provision states,

The Supreme Court shall have original but not exclusive jurisdiction of: . . . (3) All actions . . . by a State against the citizens of another State

8 That provision states,

The district courts shall have original jurisdiction of all civil actions wherein the matter in controversy . . . arises under the . . . laws . . . of the United States. . . .

9 For the provisions of the statute as amended at the time of the Court's decision See 33 U.S.C. § 1151, Et seq. (1970).

[**13] A. Federal Water Pollution Control Act

1. The Statute Before 1972

The pre-1972 Federal Water Pollution Control Act, 62 Stat. 1155, as amended, 33 U.S.C. 1151, Et seq. (1970), authorized each state, with the approval of the Secretary of the Interior, to adopt "water quality criteria applicable to interstate waters or portions thereof within" the state, 33 U.S.C. § 1160(c) (1) (1970), for the purposes of protecting the public health or welfare and enhancing the quality of water, See 33 U.S.C. § 1160(c)(3) (1970). If any state failed to adopt acceptable water quality criteria, the Act authorized the Secretary of the Interior to prescribe them, 33 U.S.C. § 1160(c)(2) (1970); water quality standards prescribed by the Secretary were subject to modification after review by a "Hearing Board" on petition of the governor of any [*158] state affected by the standards, 33 U.S.C. § 1160(c)(4) (1970). The Act also provided enforcement procedures, recently described by the Supreme Court as "cumbrous." *EPA v. California ex rel. State Water Resources Control Board*, 426 U.S. 200, 202, 96 S. Ct. 2022, 48 L. Ed. 2d 578 (1976); [**14] See also *Illinois v. Milwaukee*, supra, 406 U.S. at 103, 92 S. Ct. 1385 (describing the enforcement procedures as "long" and "drawn-out").

The procedures for abating pollution originating in one state but allegedly causing harm in a second state are of primary importance for our purposes. The Act provided that upon complaint of the governor or water pollution control agency of the second state, the Secretary should call a conference, giving all the interested parties notice of, and an opportunity to make statements at, the conference. 33 U.S.C. § 1160(d)(1), (3) (1970). After the conference, the Secretary was directed to prepare a report for the benefit of the state agencies represented at the conference in which he summarized the proceedings and discussed, among other things, the adequacy of the measures taken to abate the pollution. 33 U.S.C. § 1160(d)(4) (1970). If the measures already taken were deemed inadequate, the Secretary was to recommend appropriate remedial action to the water pollution agency in the state from which the pollution came. 33 U.S.C. § 1160(e) (1970). If after "at least [**15] six months" the state agency had not taken the necessary action, the Secretary was directed to conduct hearings at which all the interested parties would again be given an opportunity to make statements, this time before a "Hearing Board." 33 U.S.C. § 1160(f)(1) (1970). If the Hearing Board found that pollution endangering the public health or welfare was indeed occurring and that adequate steps toward abatement had not been taken, it submitted its findings and recommendations "concerning the measures, if any, which it (found) to be reasonable and equitable to secure abatement of such pollution." *Id.* The Secretary then forwarded the Hearing Board's findings and recommendations "together with a notice specifying a reasonable time (not less than six months) to secure abatement of such

pollution" to the polluters and the originating state's water pollution control agency. *Id.* If the polluter or state agency failed to take "action reasonably calculated to secure abatement" within the specified time, then the Secretary was authorized to request the Attorney General to file suit to secure abatement. 33 U.S.C. § 1160(g)(1) (1970). Discharges [**16] that reduced the quality of water below any "water quality criteria" established under the Act were subject to abatement pursuant to similar procedures. 33 U.S.C. § 1160(c)(5) (1970). The Act made no provision for private abatement suits.

It is this system of interstate water pollution abatement, in combination with the discharge permit system administered by the Army Corps of Engineers, see note 16, *Infra*, and other federal legislation, that the Court found insufficient to preempt the federal common law of interstate water pollution in *Illinois v. Milwaukee*, *supra*, 406 U.S. at 101-103, 107, 92 S. Ct. 1385.

2. The 1972 Act

Because of the inadequacies inherent in the "water quality" approach and, among other things, the ineffectiveness of the enforcement procedures described above, ¹⁰ Congress adopted the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. § 1251, *Et seq.* The 1972 amendments, which we sometimes refer to herein as the Act or FWPCA, substantially rewrote the statute, supplementing the water quality criteria with direct discharge limitations and greatly strengthening enforcement procedures. [**17] Congress declared that the national goal was to eliminate the discharge of pollutants into navigable waters by 1985. To achieve that goal, Congress established general technology-based levels of treatment for any pollutant that is to be discharged into navigable waters and specified [**159] dates by which those levels of treatment are to be achieved, § 301; ¹¹ all point sources ¹² except publicly owned treatment works ¹³ must adopt the "best practicable control technology currently available" by July 1, 1977, and the "best available technology economically achievable" by July 1, 1983, §§ 301(b)(1)(A), (2)(A); publicly owned treatment works are required to adopt "secondary treatment" by July 1, 1977 and "the best practicable waste treatment technology over the life of the (treatment) works" by July 1, 1983, §§ 301(b)(1)(B), (2)(B), and 201(g)(2)(A). The Act directs the Administrator of the Environmental Protection Agency (EPA) ¹⁴ to prescribe the specific effluent limitations achievable using "best practicable" treatment technology, §§ 301(b)(1)(A), 304(b)(1), "best available" treatment technology, §§ 301(b)(2)(A), 304(b)(2), and "secondary" treatment technology, §§ 301(b)(1)(B), [**18] 304(d)(1). See, e. g., *E. I. du Pont de Nemours & Co. v. Train*, 430 U.S. 112, 126-136, 97 S. Ct. 965, 51 L. Ed. 2d 204 (1977); *American Meat Institute v. EPA*, *supra*, 526 F.2d at 448-452. In addition, all point sources, presumably including publicly owned treatment works, must comply with "any more stringent limitation . . . established pursuant to any State law or regulations (under authority preserved by § 510) ¹⁵ or any other Federal law or regulation . . ." § 301(b)(1)(C).

10 See S.Rep.No.92-414, reprinted in (1972) U.S.Code Cong. & Admin.News, pp. 3668, 3671-3674 (1972); See also Note, "Federal Common Law in Interstate Water Pollution Disputes," 1973 U.Ill.L.F. 141, 143-144 & nn. 12-14.

11 Sections of the 1972 Act (Pub.L.No.92-500, 86 Stat. 816) are referred to in this opinion by their designations in the Statutes at Large. The parallel United States Code citations for the sections to which reference is made are as follows:

Section 101	33 U.S.C. § 1251
Section 201	33 U.S.C. § 1281
Section 212	33 U.S.C. § 1292
Section 301	33 U.S.C. § 1311

Section 304	33 U.S.C. § 1314
Section 309	33 U.S.C. § 1319
Section 402	33 U.S.C. § 1342
Section 502	33 U.S.C. § 1362
Section 505	33 U.S.C. § 1365
Section 510	33 U.S.C. § 1370
Section 511	33 U.S.C. § 1371

Section 101 33 U.S.C. § 1251 Section 201 33 U.S.C. § 1281 Section 212 33 U.S.C. § 1292
Section 301 33 U.S.C. § 1311 Section 304 33 U.S.C. § 1314 Section 309 33 U.S.C. § 1319
Section 402 33 U.S.C. § 1342 Section 502 33 U.S.C. § 1362 Section 505 33 U.S.C. § 1365
Section 510 33 U.S.C. § 1370 Section 511 33 U.S.C. § 1371

[**19]

12 "Point source" is defined as "any discernible, confined and discrete conveyance, . . . from which pollutants are or may be discharged." § 502(14).

13 For purposes of "Title II Grants for Construction of Treatment Works," treatment works are defined as "any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature to implement section 201 of this Act (which is designed to encourage the development of the "best practicable waste treatment" over the life of the treatment work) . . . (and) any other method or system for preventing, abating, reducing, storing, treating, separating, or disposing of municipal waste, including storm water runoff, or industrial waste, including waste in combined storm water and sanitary sewer systems." §§ 212(2)(A), (B). Although "treatment works" is not defined for purposes of "Title III Standards and Enforcement," the definitions provided in § 212 provide an indication of what may have been intended. We recently noted that "(a)n earlier specific definition may properly color a subsequent use of the same words without redefinition," quoting from *Kent Mfg. Corp. v. Commissioner*, 288 F.2d 812, 815 (4th Cir. 1961). *Nachman Corp. v. Pension Benefit Guaranty Corp.*, 592 F.2d 947, 952 n. 6 (7th Cir.), cert. granted, --- U.S. ---, 99 S. Ct. 288, 61 L. Ed. 2d 310 (1979).

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14 "EPA" in this opinion includes the administrator and the agency.

15 Section 510 provides,

Except as expressly provided . . . nothing in this Act shall (1) preclude or deny the right of any State or political subdivision thereof or interstate agency to adopt or enforce (A) any standard or limitation respecting discharges of pollutants, or (B) any requirement respecting control or abatement of pollution; except that if an effluent limitation, or other limitation, effluent standard, prohibition, pretreatment standard, or standard of performance is in effect under this Act, such State or political subdivision or interstate agency may not adopt or enforce any . . . less stringent . . . effluent limitation, or other limitation, effluent standard, prohibition, pretreatment standard or standard of performance . . . ; or (2) be construed as impairing or in any manner affecting any right or jurisdiction of the States with respect to waters . . . of such States.

The 1972 Act also created a permit system, called the National Pollutant Discharge Elimination System (NPDES), under which discharge [**21] permits may be granted by EPA or, where a state provides satisfactory assurances that it will enforce the requirements of the Act and EPA regulations, a [*160] designated agency of the state.¹⁶ Any discharges, except in compliance with the limita-

tions imposed in a permit, are declared unlawful. § 301(a). A permit must require the discharger to meet the minimum effluent limitations prescribed in the Act and EPA regulations. § 402(b)(1)(A).

16 This system replaced the permit system formerly administered by the Army Corps of Engineers under the Act of 1899, 30 Stat. 1152, 33 U.S.C. § 407. *United States Steel Corp. v. Train*, 556 F.2d 822, 831 & n. 7 (7th Cir. 1977); *American Meat Institute v. EPA*, *supra*, 526 F.2d at 446.

Each state agency established under the National Pollutant Discharge Elimination System is required to notify EPA of any permit to be issued under the program. § 402(d)(1). If, under the permit, the waters of another state "may be affected, [**22] " the agency is required to notify the other state, to give the other state an opportunity to submit written recommendations concerning the limitations to be imposed in the permit, and, if those recommendations are not adopted, to explain why in writing to EPA and the other state. §§ 402(b)(3), (5).

EPA may veto the issuance of any discharge permit if the waters of a state other than the issuing state may be affected. §§ 402(d)(2)(A), (b)(5). It is not clear whether the veto can be based on a ground other than violation of a standard imposed pursuant to the Act by EPA or a state. The language of § 402(d)(2)(A) suggests that it can.¹⁷ The legislative history, however, indicates that the veto must be based upon the issuing state's failure to impose limitations sufficient to assure that applicable effluent limitations, either those imposed under the Act by EPA or those imposed by the affected state, are respected.¹⁸ [*161] Since there has been no veto here, it is unnecessary for us to resolve this ambiguity.

17 Section 402(d)(2) provides that,

No permit shall issue (A) if the Administrator within ninety days of his notification under subsection (b)(5) of (402) objects in writing to the issuance of such permit, or (B) if the Administrator within ninety days of the date of transmittal of the proposed permit by the State objects in writing to the issuance of such permit as being outside the guidelines and requirements of this Act.

Comparison of §§ 402(d)(2)(A) and (B) suggest that, although vetoes must usually be based on a violation of the effluent limitations imposed under the Act, there is no such requirement where the interests of a second state are involved. But cf. § 505(h) (authorizing governor's suit against Administrator of EPA, but only for failure to enforce effluent limitations imposed under the Act against a point source in another state resulting in harm to waters in governor's state) quoted in note 19, *Infra* ; See also § 505(a) (citizens' suits to enforce limitations imposed under the Act).

[**23]

18 The Administrator's general veto authority is expressly limited to cases in which the minimum limitations imposed under the Act are violated. § 402(d) (2)(B). The Senate version of the Act, S. 2770, provided that no permit could be issued by any state agency "until the Administrator is satisfied that the conditions imposed by the State meet the requirements of this Act." S. 2770, 92d Cong., 1st Sess. § 402(d)(2) (1971), reprinted in 117 Cong.Rec. 38865, 38883 (1971); Library of Congress, *A Legislative History of the Water Pollution Control Act Amendments of 1972*, 1534, 1690 (1973). The House version of the Act, H.R. 11896, specifically rejected the permit-by-permit review approach of S. 2770 and only authorized the Ad-

administrator to veto those permits under which the waters of a second state might be affected. H.R. 11896, 92d Cong., 2d Sess. § 402(d)(2) (1972), reprinted in 118 Cong.Rec. 10804, 10824 (1972); 1 Legis.Hist., supra, 893, 1058-1059. In part, the Act incorporates the provisions of both S. 2770 and H.R. 11896. See note 17, Supra.

The House provision was intended as a state-permit analogue to the provisions of H.R. 11896, Supra, § 401, which requires every applicant for a federal license to secure a statement from the appropriate state to the effect that no applicable effluent limitation will be violated by the activity for which the license is sought. See H.R.Rep.No.92-911, 92d Cong., 2d Sess., reprinted in Legis.Hist., supra, 753, 808-814. Concerning H.R. 11896, § 402(d)(2), the House Committee explained:

The committee has included this procedure to protect States which might otherwise be affected by the issuance of a permit in a second State. This is similar to the safeguards given to States in the certification procedure under section 401. However, since permits granted by States under section 402 are not Federal permits but State permits the certification procedures are not applicable.

Id. at 814. As noted above the House specifically rejected the permit-by-permit review approach of the Senate bill, in favor of giving the individual states "maximum responsibility for the permit program." See id. See also the discussion of the 1977 amendments to the veto provisions, *Infra*.

For more detailed discussions of the legislative history of the veto provisions see *Save the Bay v. Administrator of the Environmental Protection Agency*, 556 F.2d 1282, 1284-1287 (5th Cir. 1977); *Mianus River Preservation Committee v. Administrator of EPA*, 541 F.2d 899, 906-909 (2d Cir. 1976).

[**24]

The 1972 Act also substantially modified enforcement procedures. "Whenever, on the basis of any information available to him, the Administrator finds that any person is in violation of any condition or limitation" imposed under the Act, including those contained in state-issued discharge permits, he may at his option "issue an order requiring such person to comply," commence a civil action for appropriate relief in a federal district court, or notify the appropriate state agency of the violation. §§ 309(a)(1), (3), (b). If the latter course is chosen and after 30 days the state agency has not taken appropriate action to secure compliance, the Administrator must exercise one of the first two options. § 309(a). Criminal and civil penalties are provided in §§ 309(c) and (d).

In accord with the stated policy of encouraging "public participation in the development, revision, and enforcement of any regulation, standard, effluent limitation, plan, or program established" under the Act, § 101(e), Congress authorized any "person . . . having an interest which is or may be adversely affected" to file a civil action to secure compliance with the Act against any person alleged to be in violation [**25] of the provisions of the Act or against the Administrator if he fails to perform any nondiscretionary duty under the Act. §§ 505(a), (g).¹⁹ But "(n)othing in (§ 505) shall restrict any right which any person (or class of persons) may have under any statute or common law to seek enforcement of any effluent standard or limitation or to seek any other relief (including relief against the Administrator or a State agency)." § 505(e).

19 Also, the governor of a state may file a civil action against the Administrator "where there is alleged a failure of the Administrator to enforce an effluent standard or limitation under this Act the violation of which is occurring in another State and is causing an adverse effect on the public health or welfare in his State, or is causing a violation of any water quality requirement in his State." § 505(h).

3. The 1977 Amendments. ²⁰

20 Clean Water Act of 1977, Pub.L.No.95-217, 91 Stat. 1566 (to be codified 33 U.S.C. §§ 1251, Et seq.).

[**26] The 1977 amendments are fairly extensive, but of limited significance for our purposes. In them Congress modified the National Pollutant Discharge Elimination System to provide that when EPA objects to the issuance of a permit, it must also state "the reasons for such objection and the effluent limitations and conditions which such permit would include if it were issued by the Administrator." § 65(b), 91 Stat. 1599, as amended, 33 U.S.C.A § 1342(d) (2). A procedure was provided to avoid the impasse that had been possible under the 1972 Act when EPA objected to the issuance of a specific permit but the state agency refused to issue a modified permit; under the amendments, if EPA "objects to the issuance of a permit," the issuing state is entitled to a public hearing on the objection. § 65(a), 91 Stat. 1599 as amended, 33 U.S.C.A. § 1342(d)(4); See S.Rep.No.95-370, 95th Cong., 1st Sess. 73, reprinted in (1977) U.S.Code Cong. & Admin.News, pp. 4326, 4398; H.R.Rep.No.95-830, 95th Cong., 1st Sess. 96-97, reprinted in (1977) U.S.Code Cong. & Admin.News, pp. 4424, 4471-4472. If the state either fails to request a hearing within 90 days [**27] of the objection or fails to submit a revised permit meeting the objection, then EPA may issue a permit itself "in accordance with the guidelines and requirements" of the Act. § 65(a), Supra.

Congress also adopted provisions authorizing EPA, with the concurrence of the State in which the point source is located, under limited circumstances, to modify the dates by which the effluent levels established in the 1972 Act for all point sources must be met. See §§ 43, 44, 45, 91 Stat. 1583-1586, as amended, 33 U.S.C.A. §§ 1311(g), (h), (i). The provisions applicable [*162] to modification of compliance dates for publicly owned treatment works are of particular significance here. Where construction is necessary for compliance with the "secondary treatment" or "more stringent" requirements of the 1972 Act, §§ 301(b)(1)(B), (C), but cannot be completed in time to meet these requirements or "the United States has failed to make financial assistance . . . available in time to achieve such limitations . . .," EPA or the appropriate state agency may extend the compliance date to July 1, 1983. § 45, 91 Stat. 1584-1585, as amended, 33 U.S.C.A. § 1311 [**28] (i). The language and legislative history of this provision, however, make it clear that the maximum compliance possible at the time must be achieved throughout the period and complete compliance achieved at the "earliest date practically possible." Id.; S.Rep.No.95-370, 95th Cong., 1st Sess. 47, reprinted in (1977) U.S.Code Cong. & Admin.News at 4372. The 1977 amendments also provide for pollutant-specific modifications of the requirements of the 1972 Act. § 44, 91 Stat. 1584, as amended, 33 U.S.C.A. § 1311(h). Upon an adequate showing that, among other things, "there is an applicable water quality standard specific to the pollutant for which the modification is requested" and the modification would "not interfere with the attainment or maintenance of that water quality which assures protection of public water supplies and the protection . . . of a balanced . . . population of shellfish, fish, and wildlife, and allows recreational activities, in or on the water . . .," EPA, "with the concurrence of the State, may issue a permit . . . which modifies the secondary treatment effluent limitations prescribed under the Act for publicly owned treatment works." Id.

[**29] The only other provision of the 1977 amendments that is of significance for our purposes directs EPA to conduct a study and report to Congress on "the status of combined sewer overflows in municipal treatment works operations." § 70, 91 Stat. 1608, as amended, 33 U.S.C.A. § 1375(c). The Senate committee studying the proposed legislation noted that "the second largest category of municipal treatment needs identified in the 1976 national needs list is the correction of combined sewer overflows Examples brought to the committee's attention showed combined sewer overflow problems to be a significant source of untreated sewage to the Nation's waters." S.Rep.No.95-370, Supra, 81, reprinted in (1977) U.S.Code Cong. & Admin.News, supra, p. 4406. One of the purposes of the report is to determine whether new legislation to address the problem is needed. § 70, 91 Stat. 1608, as amended, 33 U.S.C.A. § 1375(c).

B. Preemption and Compliance with the Statute As a Defense

Congress has thus established a comprehensive and detailed system for the regulation and eventual elimination of pollutant discharges into the nation's waters. Nevertheless, [**30] Congress has expressly stated that the effluent limitations imposed under the Act do not preclude the establishment of more stringent limitations by any state, § 510, See *United States Steel Corp. v. Train*, supra, 556 F.2d at 835-836, 837-838; and nothing in the Act is to be construed as "limiting the authority or functions of any officer or agency of the United States under any other law or regulation not inconsistent with (the) Act; . . ." § 511(a). The language of § 511(a) is arguably broad enough to include the federal courts and, when read in the light of § 510, suggests, if it does not require, the conclusion that Congress did not intend to preempt the federal common law of nuisance. The imposition of effluent limitations more stringent than those required under the Act, if necessary to prevent harm to a complaining party, is fully consistent with the provisions of the Act. Because of the shared authority between the federal government and the individual states established in the Act, it is plain that uniformity was not thought necessary. Even the minimum effluent limitations prescribed in the Act are not uniform because the provisions for the ad hoc modification [**31] of the degree of compliance required for specific point sources will necessarily lead to variation.

[*163] While providing in § 505 for private suits to enforce the effluent limitations prescribed in the Act, Congress specifically stated that nothing in the section "shall restrict any right which any person . . . may have under any statute or common law to seek enforcement of any effluent standard or limitation or to seek any other relief . . .," thus indicating that preemption of existing remedies was not intended. There is nothing in the phrase "any statute or common law" that suggests that this provision is limited to state common law. There is no reason to believe that Congress would have wished to preserve state common law claims and preclude federal common law claims. The preservation of all existing remedies is consistent with the recognition in this Act of the value of public participation in all aspects of the effort "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters," exemplified by the direction to EPA and states participating in the national discharge permit system to encourage such participation. See also *Citizens for a Better Environment v. EPA*, 596 F.2d 720, 722 (7th Cir. 1979). [**32] We conclude that the federal common law of nuisance has not been preempted by the Act.

For the same reasons, we reject defendants' contention that compliance with a discharge permit issued under the Act is a defense in an action based on the federal common law of nuisance. Cf. *New York v. New Jersey*, 256 U.S. 296, 308, 41 S. Ct. 492, 65 L. Ed. 937 (1921) (in which the Court noted a construction permit issued by the Secretary of War, presumably under the provisions of the Rivers and Harbors Act of 1899 that were replaced by § 402 of the 1972 Act, see note 16, Supra, incorpo-

rating discharge limitations adopted in a settlement agreement with United States but did not regard the limitations as dispositive in New York's action against New Jersey); *Baltimore & Potomac R. Co. v. Fifth Baptist Church*, 108 U.S. 317, 2 S. Ct. 719, 27 L. Ed. 739 (1883) (rejecting the defendant railroad's arguments that compliance with District of Columbia smoke stack regulations, the existence of a federal charter authorizing defendants to "make and construct all works whatever, which might "be necessary and expedient'," or congressional approval of the train route constituted a [**33] defense in a nuisance action when plaintiff suffered injury resulting from defendant's activity).²¹ But compare *Pennsylvania v. Wheeling & Belmont Bridge Co.*, (54 U.S.) (13 How.) 518, 14 L. Ed. 249 (1851) With *Pennsylvania v. Wheeling Bridge Co.*, (59 U.S.) (18 How.) 421, 15 L. Ed. 435 (1856) And *Northern Transportation Co. v. Chicago*, (99 U.S.) (9 Otto) 635, 25 L. Ed. 336 (1879).

21 The law of Wisconsin is in accord. See, e. g., *Winchell v. Waukesha*, 110 Wis. 101, 109, 85 N.W. 668, 670 (1901) ("The great weight of authority, American and English, supports the view that legislative authority to install a sewer system carries no implication of authority to create or maintain a nuisance If such nuisance be created, the same remedies may be invoked as if the perpetrator were an individual."); *Costas v. City of Fond du Lac*, 24 Wis.2d 409, 415-416, 129 N.W.2d 217, 220-221 (1964) (operation of sewage plant in accord with state specifications, orders, and regulations is no defense in nuisance action). For other state cases to the same effect, See, e. g., *People of the State of California v. Los Angeles*, 160 Cal.App.2d 494, 505-506, 325 P.2d 639, 645 (Ct.App.1958); cases cited in Annotation, "Sewage Disposal Plant as Nuisance," 40 ALR 2d 1177, 1182-1186 (1955), Later Case Service, 40 ALR 2d 77, 77 (1969), Later Case Service Supp. 42, 42 (1978); cases cited in Annotation, "Right to, and Propriety of Injunction Against Nuisance for Discharge of City Sewage," 77 L. Ed. 1213, 1227-1231 (1933); cases cited in Davis, "Theories of Water Pollution Litigation," 1971 Wis.L.Rev. 738, 768 n. 138, 771 n. 148 (1971); Cf. *Venuto v. Owens Corning Fiberglass*, 22 Cal.App.3d 116, 128-129, 99 Cal.Rptr. 350, 358-359 (1971) (air pollution).

[**34] C. Limitations on Relief

Defendants contend that even if the Act does not preempt the federal common law of nuisance, and even if compliance with the Act is not a defense, no more stringent relief can be granted by way of abatement than the federal minimum prescribed by the Act and EPA. In other words, although the federal government need not speak with a single voice, the words must be the same. As noted above, however, Congress has expressly stated that [**164] nothing in the Act should be read to limit the authority of any federal "officer or agency" so long as that authority is consistent with the provisions of the Act. Consistency does not require uniformity; the provision expressly preserving the authority of the states to impose limitations more stringent than those required under the Act, § 510, indicates that Congress did not think more stringent limitations inconsistent with the Act. Moreover, the savings clause, § 505(e), speaks not only of rights, but also of remedies. Since any effluent limitations less stringent than those provided in the Act, except pursuant to the modification procedures established, are prohibited, § 505(e) must contemplate more stringent [**35] limitations than those imposed in the Act. If accepted, defendants' argument would reduce a cause of action under the federal common law to no more than an alternative avenue for enforcement of the statute. For the reasons stated above, we do not think that Congress intended any such restriction or that the statute, fairly read, limits the relief available in a federal court.

D. Common Law of the Statute

The conclusion that the Federal Water Pollution Control Act, as amended, does not preempt the federal common law of nuisance or limit the relief available in this case does not render that Act irrelevant. A statute that does not by its terms govern the case before a court may contain indications of the legislature's judgment on relevant issues of policy or provide an appropriate principle for decision of the case.²² In applying the federal common law of nuisance in a water pollution case, a court should not ignore the Act but should look to its policies and principles for guidance. See *Illinois v. Milwaukee*, supra, 406 U.S. at 103 n.5, 92 S. Ct. 1385; Cf. *Textile Workers v. Lincoln Mills*, 353 U.S. 448, 456-457, 77 S. Ct. 912, 1 L. Ed. 2d 972 (1957). [**36]

22 See, e. g., *Moragne v. States Marine Lines*, 398 U.S. 375, 390-393, 406-408, 90 S. Ct. 1772, 26 L. Ed. 2d 339 (1970); Landis, "Statutes and the Sources of Law," *Harvard Legal Essays* 213 (1934), reprinted in 2 *Harv.J.Legis.* 7, 12-19, 21-22 (1965); Page, "Statutes as Common Law Principles," 1944 *Wis.L.Rev.* 175, 186-211; Schaefer, "Precedent and Policy," 34 *U.Chi.L.Rev.* 3, 20-22 (1966); Stone, "The Common Law in the United States," 50 *Harv.L.Rev.* 4, 14-15 (1936); Traynor, "Statutes Revolving in Common-Law Orbits," 17 *Cath.U.L.Rev.* 401, 403-408, 412-417, 421-424 (1968).

The Act contains no rules or principles that control in this case. We think, however, that the minimum treatment standards found acceptable by Congress and the effluent limitations imposed under the system established in the Act provide an appropriate starting point. Cf., e. g., *Wallis v. Pan American Petroleum*, 384 U.S. 63, 69, 86 S. Ct. 1301, 16 L. Ed. 2d 369 (1966). [**37] In the 1972 Act, Congress said that by July 1, 1977, publicly owned treatment works must, with several significant exceptions, adopt "secondary" treatment. That command was qualified by the 1977 amendments authorizing EPA or the appropriate state agency to extend the time for compliance with the secondary treatment standard to July 1, 1983. The Act's generally more stringent second stage provisions only require "the application of the best practicable waste treatment technology Over the life of the works . . .," by July 1, 1983. §§ 301(b)(2)(B), 201(g)(2)(A) (emphasis added). Thus, Congress has approved secondary treatment as an acceptable minimum for publicly owned treatment works at least until 1983 and perhaps later.²³

23 Comparison of the treatment levels demanded of publicly owned treatment works and those demanded of all other point sources suggests that Congress was of the view that publicly owned treatment works should be subject to less stringent standards than other point sources. Point sources other than publicly owned treatment works were required to implement the "best practicable control technology currently available," as determined by EPA, by July 1, 1977. § 301(b)(1)(A). Senator Muskie, the "principal author of the Act," See *American Meat Institute v. EPA*, supra, 526 F.2d at 451, expressed the view that although EPA had authority to define "best practicable" as "the equivalent of secondary treatment for industry," more stringent requirements might also be imposed, 1 *Legislative History of the Water Pollution Control Act Amendments of 1972* 167-170 (1973), quoted in *American Meat Institute v. EPA*, supra, 526 F.2d at 453. The 1972 Act required point sources other than publicly owned treatment works to implement "best available treatment" by 1983, § 301(b)(2)(A); the 1977 amendments modified this provision to require "best conventional treatment" for pollutants identified by EPA as "conventional" by July 1, 1984, and "best available treatment" for other pollutants, no later than July 1, 1987. § 42, 91 Stat. 1582-1583, as amended, 33 U.S.C.A. §§ 1311(b)(2)(A), (E), (F).

[**38] [*165] EPA has defined secondary treatment for the purposes of the Act in terms of resulting effluent quality. 40 C.F.R. § 133.102. Even though states are authorized to establish more stringent effluent limitations than those required by EPA, §§ 402, 510, there appear to be no Wisconsin regulations imposing more stringent standards, and the NPDES permits issued by the Wisconsin agency to the defendants in this case impose limitations no more stringent than those required by EPA.²⁴

24 EPA has not vetoed the permits issued by the Wisconsin agency. See notes 17 and 18, *supra*, and accompanying text. Before filing this action, Illinois invoked the enforcement procedures of the pre-1972 Act, See, Note, "Federal Common Law in Interstate Disputes," *Supra*, 1973 U.Ill.L.F. At 144 & nn. 17-19, but apparently chose not to pursue the remedy provided in § 402(b)(5) and did not attempt to have EPA veto the permits issued to the defendants under § 402(d)(2)(A).

As we shall explain in more detail below, the effluent [**39] limitations contained in the permits are less stringent than those imposed by the district court in this case. In addition, the permits contain no prohibitions against discharges of raw sewage through overflows.

While it is appropriate to give weight to Congress' expectations in adopting the Act and the standards established by EPA pursuant to the Act, we cannot forget that Congress deliberately chose to preserve existing rights and remedies. Thus, if the evidence in this case shows that requirements more stringent than those imposed in the NPDES permits are necessary to protect Illinois residents from harm caused or threatened by the defendants' sewage discharges, plaintiffs are entitled to have the more stringent requirements imposed. We can think of no other reason for Congress' preserving previously existing rights and remedies than to protect the interests of those who would be able to show that the requirements imposed pursuant to the federal statute are inadequate to protect their interests. When the complaining party is a neighboring state, the federal common law of nuisance provides a peculiarly appropriate remedy.²⁵

25 Although the Administrator's power to veto permits that will result in harm to the waters of a second state provides some protection, as noted above, his authority may be limited to those cases in which the complaining state can point to some applicable effluent limitation or water quality standard that will be violated. Furthermore, the Administrator's power to waive review of permits issued to any category of point sources may render any protection that is provided by the veto provisions illusory. §§ 402(d)(3), (e), (f).

[**40] III.

Elements of the Claim, Relief, and Standard of Proof

The elements of a claim based on the federal common law of nuisance are simply that the defendant is carrying on an activity that is causing an injury or significant threat of injury to some cognizable interest of the complainant. See *Georgia v. Tennessee Copper*, 206 U.S. 230, 238-239, 27 S. Ct. 618, 51 L. Ed. 1038 (1907).

It has been said that "in such a suit traditional limitations on equitable remedies are applicable." *United States v. Stoeco Homes*, 498 F.2d 597, 611 (3d Cir. 1974). This would mean that an injunction would be granted only when the right to relief is clear and the remedy at law inadequate. *Missouri v. Illinois*, 180 U.S. 208, 248, 21 S. Ct. 331, 45 L. Ed. 497 (1901); *Wright & Miller*, 11 Federal Practice

and Procedure, § 2942, 364, 368-369 (1973); See also *Mugler v. Kansas*, 123 U.S. 623, 672-673, 8 S. Ct. 273, 31 L. Ed. 205 (1887).²⁶ But [*166] when a state complains of pollution originating outside its territory the rules are different:

26 For state law cases to the same effect See, e. g., *Green v. Smith*, 231 Ark. 94, 96, 328 S.W.2d 357, 359 (1959); *Delaware Optometric Association v. Sherwood*, 35 Del.Ch. 507, 511, 122 A.2d 424, 427 (1956); *City of Pana v. Central Washed Coal Co.*, 260 Ill. 111, 122-123, 102 N.E. 992, 997 (1932); *City of Chicago v. Commonwealth Edison Company*, 24 Ill.App.3d 624, 632, 321 N.E.2d 412, 418 (1974); *Harden Chevrolet v. Pickaway Grain Co.*, 27 Ohio Op. 2d 144, 147, 194 N.E.2d 177, 180 (Ct.C.Pl.Ohio 1961); *Wade v. Fuller*, 12 Utah 2d 299, 301, 365 P.2d 802, 804 (1961).

[**41]

If the state has a case at all, it is somewhat more certainly entitled to specific relief than a private party might be. . . .

It is a fair and reasonable demand on the part of a sovereign that the air over its territory should not be polluted . . . by the act of persons beyond its control If any such demand is to be enforced this must be, notwithstanding the hesitation that we might feel if the suit were between private parties, and the doubt whether, for the injuries which they might be suffering to their property, they should not be left to an action at law.

Georgia v. Tennessee Copper, supra, 206 U.S. at 237-238, 27 S. Ct. at 619. Moreover, when the polluting activity is shown to endanger the public health, injunctive relief is generally appropriate. See *Harrison v. Indiana Auto Shredders Co.*, 528 F.2d 1107, 1122-1123 (7th Cir. 1976) (diversity case applying Indiana law).

Similarly, while determining whether to issue an injunction generally involves a balancing of the interests of the parties,²⁷ *Wright & Miller*, Supra, § 2942 at 366-367 & n.43, the balance is of less importance when the plaintiff is a sovereign state. [**42] See *Georgia v. Tennessee Copper*, supra, 206 U.S. at 238, 27 S. Ct. 618. And if the pollution endangers the public health, injunctive relief is proper, without resort to any balancing. See *Harrison v. Indiana Auto*, supra, 528 F.2d at 1122-1123.

27 For state law cases using this balancing test, See, e. g., *Davis*, "Theories of Water Pollution Litigation," 1971 Wis.L.Rev. 738, 766-767 n. 130; See also *Harrison v. Indiana Auto*, supra, 528 F.2d at 1123 (diversity case). Wisconsin courts apparently do not use the test. *Davis*, Supra, at 767-768 n. 134.

In exercising its original jurisdiction in interstate pollution cases, the Supreme Court has applied a preponderance of the evidence standard when the defendant is a private party, *Georgia v. Tennessee Copper*, supra, 206 U.S. at 238-239, 27 S. Ct. 618 but a clear and convincing evidence standard when the defendant is a state, *New York v. New Jersey*, 256 U.S. 296, 309, 41 S. Ct. 492, 65 L. Ed. 937 (1921); [**43] *Missouri v. Illinois*, 200 U.S. 496, 520-522, 26 S. Ct. 268, 50 L. Ed. 572 (1906).²⁸ In both *New York v. New Jersey* And *Missouri v. Illinois*, supra, 200 U.S. at 520-522, 26 S. Ct. 268, use

of the higher standard was attributed to the sovereign status of the defendant. For example, in *New York v. New Jersey* the Court explained that

28 See also *Missouri v. Illinois*, *supra*, 180 U.S. at 248, 21 S. Ct. 331.

the burden upon the state of New York of sustaining the allegations of its bill is much greater than that imposed upon a complainant in an ordinary suit between private parties. Before this court can be moved to exercise its extraordinary power under the Constitution to control the conduct of one state at the suit of another, the threatened invasion of rights must be of serious magnitude and it must be established by clear and convincing evidence.

New York v. New Jersey, *supra*, 256 U.S. at 309, 41 S. Ct. at 496. Justice Harlan's opinion for the [**44] Court in *Ohio v. Wyandotte Chemicals*, *supra*, 401 U.S. at 501-502, 504-505, 91 S. Ct. 1005, however, suggests that use of the higher standard was a part of an accommodation devised to enable the Supreme Court, structured as it is "to perform as an appellate tribunal," *Id.* at 498, 91 S. Ct. at 1009, to cope with original actions in that Court involving interstate disputes regarding air and water pollution.²⁹ He also indicated [*167] that the higher standard of proof might be appropriate in original actions against private defendants as well. *Id.* at 501 n.4, 91 S. Ct. 1005. Justice Harlan's rationale for requiring the higher standard of proof is inapplicable when the action is tried in a trial court; and the alternative, sovereign state rationale recognized in the earlier cases is inapplicable here, *Cf. Illinois v. Milwaukee*, *supra*, 406 U.S. at 98, 92 S. Ct. 1385 (political subdivisions of a state are not "States" as used in 28 U.S.C. § 1251(a)(1), see note 6, *Supra*). Accordingly, we think the correct standard of proof in this case is a preponderance of the evidence³⁰ rather than clear and convincing [**45] evidence, although we can say, as did the district court, that use of either standard would produce the same result.

29 The complementary part of the accommodation was that the Court imposed on itself "the duty of applying only legal principles "which (it) is prepared deliberately to maintain against all considerations on the other side" *Id.* 401 U.S. at 501, 91 S. Ct. at 1011.

30 Although federal law governs, we note that some state courts have also adopted the preponderance standard in nuisance cases. See, e. g., *City of Northlake v. City of Elmhurst*, 41 Ill.App.2d 190, 197, 190 N.E.2d 375, 379 (1963); *Iowa v. Miller*, 250 Iowa 1369, 1373, 98 N.W.2d 859, 860 (1959); *Findley Lake Property Owners v. Town of Mina*, 31 Misc.2d 356, 154 N.Y.S.2d 775, 795 (N.Y.Sup.Ct.1956); *Welborn v. Page*, 247 S.C. 554, 563, 148 S.E.2d 375, 379 (1966); See also *Boller v. Texas Eastern Transmission*, 87 F. Supp. 603, 605 (E.D.Mo.1949) (diversity case).

[**46] IV.

Sufficiency of the Evidence Supporting Findings of Fact

The district court found that the defendants dump substantial quantities of pathogen-containing sewage into Lake Michigan each year, that the lake currents carry the pathogens into Illinois waters, where they may infect drinking water supplies and pose a danger to swimmers, and therefore that

defendants' actions pose a significant risk of injury to Illinois residents. These findings are not clearly erroneous. Rule 52, Fed.R.Civ.P. The evidence supporting the findings, which we have carefully reviewed,³¹ may be summarized as follows:

31 In an unpublished order filed with this opinion we discuss the evidentiary support for the district court's findings of fact in detail. Since this factual discussion is of little precedential value, we omit it from this opinion in favor of a short summary. See Circuit Rule 35.

Any population as large as Milwaukee's will include carriers of enteroviruses,³² who will excrete the viruses. Therefore the sewage of [**47] a city as large as Milwaukee inevitably contains these viruses. Similarly, the sewage of any large city will also contain pathogenic bacteria.

32 Enteroviruses, sometimes referred to as enteric viruses, are those that inhabit the gastroenteric tract of human beings. Many of these viruses are pathogenic, causing diseases such as polio, pleurodynia, myocarditis, meningitis, and encephalitis.

The sewer systems defendants operate have a total of approximately 239 bypass or overflow points from which untreated sewage escapes to flow directly or indirectly into lake Michigan or into rivers that empty into the lake.³³ Most of these overflow [*168] points are either pumping stations or what are called "gravity overflows." Both types are triggered by the level of sewage in the system. In the former, pumps are activated by electrodes inside the sewer when the sewage flow reaches the level of the electrodes; when the pumps are activated, raw sewage is either pumped into storm sewers, which empty into rivers that [**48] in turn empty into Lake Michigan, or dumped directly into the rivers. The gravity overflows are simply pipes placed inside the sewers; when the sewage level rises to that of the pipes, raw sewage pours out into either storm sewers or rivers and then into Lake Michigan. Since both types of overflow points are activated by the level of sewage, an overload or a blockage in the sewers that causes the sewage level to rise will cause overflows, even if the sewer capacity would otherwise be adequate. Because ground water and water from storm sewers sometimes "infiltrates" or flows into sanitary sewers, overflows from the sanitary sewers, as well as from combined sewers, are especially likely during wet weather. In a single month in 1976 the untreated sewage discharged from just 11 of the 239 overflow points totalled 646.46 million gallons.

33 Both of the defendant commissions act as agents of the Metropolitan Sewerage District of the County of Milwaukee, a municipal corporation that holds title to all property acquired by either commission but is not a defendant in this case. The city commission is responsible for "disposal of the sanitary and industrial sewage generated within the City of Milwaukee and to this end has established and maintained a system of intercepting sewers within the City and . . . operates the Jones Island and South Shore treatment plants; . . ." The county commission is responsible for "collection and transportation of sanitary and industrial sewage from outside . . . Milwaukee but within the service area of the Metropolitan Sewerage District . . . for disposal at the Jones Island and South Shore treatment plants, all subject to approval by the City Commission; . . ." See generally Wis.Stat. Ann. § 59.96(6) (West). The City of Milwaukee seems to be solely responsible for the sewers within its boundaries, other than the intercepting sewers.

There are 18 bypass points and 31 overflow points on the Metropolitan (or Main) Interceptor System, which is the network of sanitary sewers in the Milwaukee metropolitan area that carries sewage to the Jones Island and South Shore treatment plants. Sewage generated in the

26 municipalities within the area first flows into a "lateral sewer" and from there into "local collector sewers," which connect with the Metropolitan Interceptor System. There are 78 overflow points (called "crossovers") on Milwaukee's sanitary sewer system and 112 overflow points on the city's combination storm water and sanitary sewer system (called combined sewer overflows).

[**49] In addition to the pathogens in the raw sewage that the defendants dump into Lake Michigan, pathogens are contained in the effluent that the South Shore and Jones Island treatment plants discharge directly and indirectly into Lake Michigan³⁴ when treatment of sewage at those plants is inadequate, as it has sometimes been. Biochemical oxygen demand (BOD),³⁵ as an indicator of the presence of organic material, and the presence of suspended solids³⁶ are both significant factors in evaluating the adequacy of sewage treatment, especially as to virus and bacteria elimination.³⁷ EPA regulations and the discharge permits issued by the Wisconsin Department of Natural Resources for the Jones Island and South Shore plants require that the average daily BOD 5 (see note 35, *Supra*) and suspended solids content of the effluent not exceed 30 milligrams per liter (mg/l) in any 30-day period. Not only were the 30-day average daily limitations frequently violated at Jones Island and South Shore, but also, on occasion, even if these limitations were met, discharges on individual days greatly exceeded the 30 mg/l limitation.³⁸

34 South Shore effluent is discharged into Lake Michigan, but Jones Island effluent is discharged into the Milwaukee Harbor and from there flows into Lake Michigan.

[**50]

35 Biochemical oxygen demand (BOD) is an "index of the biodegradable organics present in the effluent." *Standard Methods for the Examination of Water and Wastewater*, 513, 544 (14th ed. 1975). BOD is generally "measured over a five-day period," *American Meat Institute v. EPA*, *supra*, 526 F.2d at 447, hence the abbreviation BOD 5.

36 As the term suggests, "suspended solids" are "particles of organic and inorganic matter suspended in the water or floating on its surface." *American Meat Institute v. EPA*, *supra*, 526 F.2d at 447.

37 Chlorine, contained in hypochlorous acid, is one of the most common disinfectants used in sewage treatment and is the only disinfectant used at either Jones Island or South Shore. Ammonia or nitrogen in organic material reacts with chlorine to form compounds that are either ineffective or less effective than hypochlorous acid as viricides and bactericides. Viruses or bacteria embedded in suspended solids, organic or inorganic, will be protected from effective chlorination.

38 Both EPA regulations and the discharge permits impose seven-day daily average BOD 5 and suspended solids limitations of 45 mg/l. We note that on some occasions the defendants' individual day discharges absolutely precluded meeting the seven-day daily average.

[**51] The evidence established that, at temperatures between 40 and 70 degrees Fahrenheit, 90% Of the bacteria discharged on any given day will generally "die-off" within two to four days, although they can survive for four to eight days. But, at temperatures between 40 and 50 degrees Fahrenheit, viruses will survive for months; even at 70 degrees, a temperature rarely reached by Lake Michigan except in July and August, viruses will survive for about two weeks. All of the witnesses who testified concerning the transport of pathogens discharged at Milwaukee into Illinois waters agreed that the southerly currents were strong enough and persisted long enough to carry the patho-

gens into Illinois waters in [*169] less than four days. They differed only as to the number of times that this could be expected to occur in a given year.

Pathogens discharged at Milwaukee will sometimes be carried into Illinois waters close enough to shore to come in contact with swimmers and to be taken in by water treatment plants. A swimmer can be infected by getting contaminated water into his mouth or nose or on a cut or abrasion on the skin. Drinking water can be contaminated by viruses or bacteria in lake [**52] water if a water treatment plant malfunctions because of human error or mechanical breakdown. Furthermore, there was evidence that viruses and bacteria can survive the treatment at a drinking water plant, even in the absence of error or breakdown. If viruses or bacteria contaminate the drinking water supplies, Illinois residents ingesting the water can of course become infected.

Defendants estimate that the effluent from Jones Island and South Shore contains about 1,100,000 pounds of phosphorus each year; the phosphorus content of defendants' raw sewage discharges is unmeasured. The district court found that this constituted a substantial contribution to the accelerated eutrophication of the water in the western in-shore zone of Lake Michigan, within the territorial boundaries of the State of Illinois, and also found that the State of Michigan was injured by accelerated eutrophication, aggravated by defendants' discharges.³⁹

39 "Eutrophication" is a natural process, and refers to the gradual increase of nutrient concentration in a body of water, which in turn causes increasing concentrations of phytoplankton and other living organisms. Man's nutrient inputs may, however, accelerate the evolution. Liminologists regard phosphorus as a "controlling element" in the process. Since phosphorus is necessary to support the growth of phytoplankton, limiting phosphorus imposes an upper limit on the external manifestations of eutrophication, which include reduction of clarity and oxygen content, production of obnoxious odors, and reduction of the quality of drinking water supplies.

[**53] V.

Sufficiency of the Evidence Supporting the Relief Granted

A. Relief Granted by the District Court

The district court's judgment order requires the defendants to eliminate all overflows, defined as any "crossover, bypass, diversion structure, relief structure, pump station or any other device or mechanism by which human fecal waste is discharged directly or indirectly to public streams, rivers or lakes without collection and treatment," located outside the combined sewer system area by July 1, 1986. As to the 112 combined sewer overflows, the defendants must construct a collection and conveyance system with a storage capacity of 2605 acre-feet⁴⁰ by December 31, 1989. Any overflow from this collection and conveyance system must receive minimum "treatment" consisting of "bar screen" filtering, followed by "drum screen" filtering, and chlorination. Defendants must either modify existing sewage treatment facilities or construct new facilities to treat all sewage, including that collected in the combined sewer collection and conveyance system, in order to meet the following effluent limitations by December 13, 1986:

40 An "acre-foot" is "the volume that would cover one acre to a depth of one foot." Webster's Third New International Dictionary (unabridged) 19 (1971).

[**54]

(1) based on 30 consecutive daily samples, an average of 5 mg/l suspended solids, provided that no single sample exceed 10 mg/l suspended solids;

(2) based on 30 consecutive daily samples, an average of 5 mg/l BOD 5, provided that no single sample exceed 10 mg/l BOD 5;

(3) based on daily samples, a free chlorine residual after 15 minutes exposure using the amperometric test;

(4) based on daily grab samples, fecal coliform counts not exceeding 40/100 ml; and

(5) based on daily sampling, a monthly average of 1 mg/l phosphorus.

The order also provides for evidentiary hearings to secure modifications of the order [*170] or to determine whether the provisions of the order have been violated. In any such hearing the defendants must bear the burden of proving by a preponderance of the evidence that the modification is necessary or that any alleged violation of the order did not occur or was excused.

B. Overflows

That part of the district court's order requiring defendants to eliminate all overflows outside the combined sewer system by July 1, 1986 and to construct a collection and conveyance system for the combined sewer system that [**55] will practically eliminate overflows on the combined sewer system by December 31, 1989 is supported by the evidence and is reasonable.

1. Overflows Outside the Combined Sewer Area

There appear to be no provisions in the Act or EPA regulations expressly forbidding the discharge of raw sewage into public waters from overflow points. Yet such a prohibition is at least implicit in the provisions of § 301. ⁴¹ It would be senseless to prohibit the discharge of effluent from publicly owned treatment works not meeting the secondary treatment requirements of § 301(b)(1)(B), if raw sewage can nonetheless be discharged at will from overflow points before it reaches the treatment works. The discharge permits that the Wisconsin agency issued for the South Shore and Jones Island treatment plants prohibit, except under very limited conditions, any "diversion or bypass" of raw sewage At the treatment works. Although the discharge permits do not otherwise prohibit overflow discharges, the permits do require the city commission to "initiate" programs "leading to the elimination or control of all discharge overflow and/or bypass points" Under the permits, plans for the elimination or control [**56] of overflows were to be submitted to the Wisconsin agency by December 31, 1975. It is not clear from the record whether any plans were submitted, or, if they were, what their terms were and what action was taken.

41 See also §§ 212(2)(A), (B), quoted in note 13, Supra ; § 70, 91 Stat. 1608, as amended, 33 U.S.C.A. § 1375(c); S.Rep.No.95-370, Supra, at 81, reprinted in (1977) U.S.Code Cong. & Admin.News, supra, at 4406.

In any event, the provisions of these permits appear to have been modified. In July, 1976, the defendant commissions filed an action in a Wisconsin state court against the Wisconsin Department of Natural Resources, the state's discharge permit issuing agency, challenging the validity of the requirements of the permits issued for South Shore and Jones Island. The state agency answered, asserting the validity of the permit requirements, and filed a counterclaim alleging that the defendant commissions had violated the permit effluent limitations on numerous occasions. The [**57] state agency also alleged

that under dry weather and wet weather conditions, bypassing and overflowing occur within the sewerage systems of the Commissions and such discharges must either be eliminated or meet secondary treatment standards by July 1, 1977

The state court suit was resolved by a settlement agreement, approved by the court on May 25, 1977, in which the sewerage commissions accepted the requirement that they eliminate Dry weather bypasses and overflows on the Main Interceptor System by July 1, 1982, and complete construction of relief sewers by July 1, 1983. While construction of relief sewers and the other construction contemplated in the agreement presumably is intended to mitigate overflows, there is no specific date by which Wet weather overflows must be eliminated. The sewerage commissions also agreed to "coordinate" a district-wide effort to "correct" wet weather bypassing and overflows on the separate sewer systems of the municipalities located within the Metropolitan Sewerage District of the County of Milwaukee, See note 33, Supra. Under the agreement, any of the 26 municipalities within the district, by adopting a "resolution of commitment to [**58] the correction of wet weather related bypassing and overflowing [*171] within its sewerage system" becomes subject to the supervision of the commissions, which are required to make sure that all "corrective work" is complete by July 1, 1986. We need not decide whether modification of discharge permits in this manner complies with the procedural requirements of §§ 402(b)(3), (5), (6) or the substantive requirements of §§ 402(b)(1)(A), (B). For our purposes, it is sufficient that the state agency has condemned raw sewage discharges.

It is doubtful whether anyone, layman or expert, would argue that the discharge of raw sewage into public waters is a satisfactory alternative to collection and treatment of sewage, even though it may be conceded that it may take time to fund and provide collection and treatment facilities, and therefore the raw sewage discharges may have to be endured for the short term. Donald Wieland, Director of Engineering for the Sewerage Commission of the City of Milwaukee, flatly stated that discharging raw sewage into public waters as a permanent solution to sewage overloads was not "sound sanitary engineering practice":

Q. As a design engineer responsible [**59] for designing sewers with adequate hydraulic capacity, do you consider it sound sanitary engineering practice to design and install overflow devices which are intended to permit the discharge of raw sewage as a permanent solution to hydraulic overloads on an interceptor system?

A. Certainly not.

Similarly, Dale Lundy, a hydraulic and sanitary engineering consultant called by plaintiffs, testified that collection and treatment is "considered preferable" to discharge of raw sewage. Defendants point to nothing in the record that would even suggest that the discharge of raw sewage into public waters is either an acceptable long range solution to the problem of disposing of human wastes or a practice that can be regarded as safe.

The "crossover" overflow devices on the city's so-called "separate" system also fall within this aspect of the court's order. Rather than discharging raw sewage directly into public waters, the crossover devices dump the sewage into storm sewers which in turn dump it into the public waters. There may or may not be water in the storm sewers when the crossover devices are activated, and therefore the crossover overflow devices may result in discharges [**60] of raw sewage into public waters in precisely the same manner as the overflow devices that dump sewage directly into public waters.⁴² We note that the discharge permit apparently issued to the City of Milwaukee by the Wisconsin agency, as modified, See note 33, *Supra*, requires the city to "initiate a program leading to the elimination of the sanitary sewer crossovers (gravity) and the electrically operated relief pumps" on the city's "separate" sanitary sewer system "to assure attainment of all applicable Water Quality Standards."

42 As to the significance of any dilution that might occur in the storm sewers See the discussion of combined sewer overflows, *Infra*.

We have seen that, depending on the efficiency of the treatment, even effluent from a treatment plant may contain pathogens that pose a danger to Illinois residents and phosphorus that contributes to the accelerated eutrophication of the lake. Obviously then untreated sewage poses a greater danger. We therefore affirm the district court's order to [**61] the extent that it requires defendants to eliminate discharges of untreated sewage outside the combined sewer system area.

2. Overflows Within the Combined Sewer Area

In considering the city's combined sewer overflows, it is again appropriate to take as a starting point the provisions of the Act. Although there is no provision expressly prohibiting "combined sewer overflows," we think that such a prohibition can be inferred from the general provisions of § 301. For, as noted above, it simply does not make sense to read the statute as [*172] authorizing unrestricted discharges of untreated sewage; "dilution" by storm water does not constitute treatment. It seems apparent that the amount of dilution that has taken place when an overflow occurs depends entirely on what the relative volumes of sewage and water in the sewer happen to be at the time of the overflow. The overflow mechanisms do not regulate the amount of dilution or distinguish between pure and diluted sewage. If the total amount of sewage and water introduced into a sewer exceeds its capacity, the excess is discharged into the rivers and the lake; it may be either "diluted" or "undiluted." That the flow from the combined [**62] sewers is supposed to go to the treatment plants suggests that not even the city believes that the dilution in the combined sewers is sufficient to render the discharges harmless.⁴³

43 See also the expression of concern about combined sewer overflows in the Senate committee report accompanying the 1977 amendments, quoted *Supra*; see generally the defi-

nitition of treatment works, including "waste in combined storm water . . . sewer systems." § 212, quoted *Supra*, note 13.

EPA regulations concerning treatment plants that receive sewage from combined sewers recognize that during wet weather it may be difficult for a treatment plant to meet secondary treatment effluent limitations, but those treatment plants are not exempt from the requirements of the regulations, and "diluted" sewage, like raw sewage, must be treated before being discharged:

Secondary treatment may not be capable of meeting the percentage removal requirements . . . during wet weather in treatment works which receive flows from combined sewers [**63] (sewers which are designed to transport both storm water and sanitary sewage). For such treatment works, the decision must be made on a case-by-case basis as to whether any attainable percentage removal level can be defined, and if so, what that level should be.

40 C.F.R. § 133.03(a). Implicit is a recognition that dilution alone is inadequate to protect the receiving waters.

The discharge permit issued to the City of Milwaukee required the city to "initiate a program leading to the attainment of control of overflows from the City's combined sewer system . . . to assure attainment of all applicable Water Quality Standards." Although the City of Milwaukee was not one of the named plaintiffs in the state court litigation referred to above, the settlement agreement appears to modify this provision and to contemplate "completion of construction (on the combined sewer system) and achievement of applicable water quality standards by July 1, 1993." Again we need not decide whether a modification accomplished in this way meets the procedural requirements of the Act or whether the terms of the modification meet the substantive requirements of the Act. It is enough that neither Congress [**64] nor any agency charged with responsibility under the Act has approved the practice of discharging untreated sewage from a combined sewer system into public waters.

The requirements in the district court's order that the defendants collect and treat the sewage in combined sewers before discharging it directly or indirectly into Lake Michigan is proper in light of the evidence. Defendants concede the feasibility of the completion date requirements.

3. Illinois' Regulation of Overflows Within Its Own Jurisdiction

Defendants attack the overflow elimination provision of the district court's order on the additional ground that Illinois does not even require elimination of sewage overflows within its own jurisdiction. Defendants cite § 602 of the Illinois Pollution Control Board Rules and Regulations, Chapter 3: Water Pollution. There is precedent, in a case of this kind, for considering the rules of the complaining state as an indication of what is appropriate for the protection of the residents of that state. *Missouri* [*173] v. *Illinois*, *supra*, 200 U.S. at 525-526.⁴⁴ The argument is, on its face, inapplicable to sanitary sewer overflows since Illinois does prohibit [**65] those, Illinois Pollution Control Board Rules and Regulations, *Supra*, § 602(b) (1976);⁴⁵ consequently, we interpret defendants' argument to be that it was improper to order collection and treatment of sewage in the combined sewer system area.

44 "Where, as here, the plaintiff has sovereign powers, and deliberately permits discharges similar to those of which it complains, it not only offers a standard to which the defendant has the right to appeal, but, as some of those discharges are . . . (at points where they could cause the

injury complained of), it warrants the defendant in demanding the strictest proof that the plaintiff's own conduct does not produce the result, or at least so conduce to it, that courts should not be curious to apportion the blame." 200 U.S. at 525-526, 26 S. Ct. at 270.

45 Defendants point to one place in Illinois where sewage that has not been fully treated may be discharged into Lake Michigan, viz., Waukegan. At present about twice a year and "ultimately about once a year" some sewage that has only received treatment consisting of 10 hours of sedimentation and chlorination will be discharged into Lake Michigan. This discharge appears to be in violation of Illinois water pollution regulations, and therefore provides little support for defendants' contention.

[**66] Section 602(c) does not prohibit combined sewer overflows, but "all dry weather flows, and the first blush of storm flows" must meet applicable effluent limitations, which for Lake Michigan are comparable to those imposed by the district court, and new combined sewers are prohibited. *Id.*, § 602(c) (1).⁴⁶ Combined sewer flows equal to ten times the average "dry weather flow" must receive "primary treatment and disinfection with adequate retention time." *Id.*, § 602(c)(2). These requirements seem to be comparable to the treatment of overflows from the collection and conveyance system prescribed by the district court. The Illinois regulations further provide that, if necessary to prevent sludge accumulation or oxygen level depression, flows greater than ten times the average "dry weather flow" must be treated by "retention and return to the treatment works or otherwise." *Id.*, § 602(c) (3). Thus, it appears that defendants' only complaint based on a comparison with the Illinois regulations relates to the size of the retention facility required by the court.

46 The Illinois Pollution Control Board Rules and Regulations require all effluents discharged into Lake Michigan to meet a 5 mg/liter suspended solids standard and a 4 mg/liter BOD 5 standard, Ill. Pollution Control Board Regulations, *Supra*, § 404(d).

[**67] The details of the relief to be granted are in large part matters left to the trial court's discretion; in any event, the defendants do not provide us with evidence sufficient to justify disagreement with what the court found necessary or evidence sufficient to show that the marginal increase in cost of building a facility of the size required by the district court is significantly greater than the cost of building a facility of the size presumably contemplated by defendants. Furthermore, although Illinois permits some combined sewer overflows, it also, unlike the defendants, requires some treatment. The trial court is not limited by the law of the complaining state with respect to each detail of the relief to be granted.

C. Effluent Limitations

Neither the minimum effluent limitations prescribed by EPA pursuant to the provisions of the Act nor the effluent limitations imposed by the Wisconsin agency under the National Pollutant Discharge Elimination System limit a federal court's authority to require compliance with more stringent limitations under the federal common law. Nevertheless, those standards provide guidelines which a court should not ignore.

EPA regulations define [**68] "secondary treatment" in terms of resulting effluent quality, in part, as follows:

(a) Biochemical Oxygen Demand (five-day). (1) The arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 30 milligrams per liter.

[*174] (2) The arithmetic mean of the values for effluent samples collected in a period of 7 consecutive days shall not exceed 45 milligrams per liter.

(3) The arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal).

(b) Suspended Solids. (1) The arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 30 milligrams per liter.

(2) The arithmetic mean of the values for effluent samples collected in a period of 7 consecutive days shall not exceed 45 milligrams per liter.

(3) The arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 15 percent [**69] of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal).

40 C.F.R. § 133.102. As noted above, for publicly owned treatment works the Act requires no more than secondary treatment until July 1, 1983, when they must implement the "best practicable waste treatment technology over the life of the (treatment) works." § 201(g)(2)(A); See § 301(b)(2)(B). While point sources must comply with any more stringent requirements of the states in which they are located, Wisconsin does not appear to have adopted any more stringent limitations; the discharge permits issued to the defendants in this case do not impose any more stringent limitations than those in EPA's regulations.

Both the South Shore and Jones Island plants must meet the following conditions under their discharge permits:

(1) based on daily samples, a monthly average of 30mg/l BOD 5 and a weekly average of 45mg/l BOD 5, provided that neither the monthly nor the weekly average ever exceed 15% Of the average BOD 5 content of the influent during the same period (85% Removal);

(2) based on daily samples, a monthly average of [**70] 30mg/l suspended solids and a weekly average of 45mg/l suspended solids, provided that neither the monthly nor the weekly average ever exceed 15% Of the average suspended solids content of the influent during the same period (85% Removal);

(3) based on twice weekly "grab samples," a monthly average fecal coliform count of 200/100ml and a weekly average fecal coliform count of 400/100ml;

(4) based on daily samples, a monthly average of 1mg/l phosphorus; and

(5) monitoring of both total residual chlorine and available "free" chlorine in the effluent, but no specific requirements.

All of the effluent limitations imposed by the district court, except the phosphorus limitation, are significantly more stringent than those prescribed by EPA or in the discharge permits: in lieu of 30mg/l BOD 5 and suspended solids, the district court requires 5mg/l; in lieu of 200 fecal coliform cells per 100ml, the district court requires 40/100ml; in lieu of the monitoring requirement for chlorine, the district court requires a free chlorine residual 15 minutes after exposure. Further, as to BOD 5 and suspended solids, the district court imposes an absolute maximum of 10mg/l [**71] instead of the variable 85% Removal requirement in the EPA regulations and the discharge permits.

These effluent limitations imposed by the district court all relate to the hazard presented to Illinois residents by Milwaukee's discharge of sewage containing pathogens. Although aware that these limitations could be consistently met only by constructing what are referred to as "advanced waste treatment" plants, the court found that such treatment was necessary to protect Illinois residents from the danger presented by Milwaukee's discharges. We are unable to conclude, after a careful examination of the evidence cited by plaintiffs to justify the limitations imposed, that this evidence was sufficient.

[*175] We recognize that once liability has been established, a trial court has broad authority to fashion appropriate relief. This rule is particularly applicable in an area of law where the appropriate relief will invariably depend on the circumstances of each case. See, e. g., *Washington v. General Motors Corp.*, 406 U.S. 109, 115-116, 92 S. Ct. 1396, 31 L. Ed. 2d 727 (1972). Nevertheless, a court, unlike a legislature or an administrative agency, is not free to rest [**72] solely upon what it thinks desirable; there must be evidence to support its conclusion that the relief granted is necessary to protect the complaining party from harm.⁴⁷

47 Cf. *Milliken v. Bradley*, 433 U.S. 267, 280, 97 S. Ct. 2749, 2757, 53 L. Ed. 2d 745 (1977) ("(L)ike other equitable remedies, the nature of the desegregation remedy is to be determined by the nature and scope of the constitutional violation. . . . The remedy must therefore be related to "the condition alleged to offend the Constitution").

To support the 5 mg/l BOD 5 and suspended solids limitations imposed by the district court, Illinois relies on the testimony of one witness who asserted that even at 30mg/l suspended solids "you

are going to have a lot of organics tied up with solids that is going to use up your chlorine, and that the chlorine can't even get into." Further, Illinois cites the general testimony that organic matter and suspended solids interfere with effective chlorination and therefore should be [**73] reduced as much as possible. Illinois also relies on the testimony of one witness that the kind of treatment required to meet the 5 mg/l standard is preferable to the kind of treatment now used by the defendants. And finally, Illinois points to evidence that one of the defendants' consultant sanitary engineers recommended treatment comparable to that required to meet the 5 mg/l standard, that three cities have been required to meet similar limitations, and that several cities have voluntarily decided to modify their own treatment facilities in ways similar to that which would be required under the district court's order.⁴⁸

48 We only summarize the evidence in this opinion; the evidence relied on by Illinois is discussed in detail in the unpublished order filed with this opinion. See note 31, *Supra*.

The evidence shows that suspended solids and organic matter interfere with chlorination, and therefore that there is some correlation between suspended solids and BOD 5 and effective chlorination. The evidence [**74] does not, however, show how much more effective chlorination would be at 5mg/l suspended solids and BOD 5 than at 30mg/l suspended solids and BOD 5; the difference may be significant or it may be *De minimis*.⁴⁹

49 Wellings testified that tests had failed to demonstrate any viruses in effluent containing only 5 Jackson Turbidity Units per liter. But Wellings' work focused primarily on the virus content of effluent from treatment facilities and not on removal efficiencies. For the purpose of determining whether significant benefits will result from reducing solids and BOD 5 from 30 mg/l to 5 mg/l, it is not enough to know that tests have shown viruses in effluent from a plant designed to meet the 30 mg/l standard and similar tests have failed to show viruses in a plant designed to meet the 5 mg/l standard. Nor is it enough to take random influent samples and random effluent samples, for the virus content of the sewage necessarily varies. Virus content in the influent may be much more significant than the particular solids or BOD 5 level the plant is designed to achieve. Furthermore, the flow rates at the time the tests are conducted are important, for it is virtually meaningless to say that a plant designed to meet the 5 mg/l standard performs better than an overloaded plant designed to meet the 30 mg/l standard.

[**75] That a few cities have adopted the more stringent standards is hardly enough to prove that those standards are necessary here, especially when the persons to be protected are many miles down the lakeshore from the discharge points. Cf. Comptroller General of the United States, "Report to Congress: Better Data Collection and Planning is Needed to Justify Advanced Waste Treatment Construction" (1976) (pointing out that several cities began construction of advanced waste treatment facilities without adequate consideration of the expected costs and benefits of such facilities).

Our difficulty with the evidence reviewed above is that it consists merely of conclusions of the experts and does not explain [*176] why the particular standards are necessary to protect the health of Illinois residents.⁵⁰ We are asked to accept the conclusions on faith. It is difficult for us to see how the opinion of an expert can be intelligently appraised unless it is supported by reasons. This is especially so when the opinion is offered to support effluent limitations markedly lower than (a) those established by EPA in its regulations, (b) those established by the state permit authority with the [**76] duty of protecting residents in the immediate environs of the discharges; and (c) those established by the complaining state itself for waters other than Lake Michigan.⁵¹ The record is con-

spicuously silent as to the reasons these less stringent standards were found adequate to protect persons in the immediate environs of the discharges by experts who were presumably as dedicated to the protection of public health and the environment as those on whose conclusions plaintiffs rely, and why those reasons are inapplicable here, especially when the discharges occur at least 25 miles from any of the persons to be protected. In short, plaintiffs point to nothing in the record, and we have found nothing, to connect the effluent limitations imposed by the district court with the protection of Illinois residents. If enforcement of the limitations imposed in the discharge permits proves inadequate to protect Illinois residents, then more stringent limitations may become necessary. But on the record before us, we cannot sustain the district court's order in this respect.⁵²

50 While Wellings, who comes the closest to providing evidentiary support for the suspended solids limitations the court imposed, testified that "the problem with 30 milligrams per liter is you are going to have a lot of organics tied up with solids that is going to use up your chlorine, and that the chlorine can't even get into," and there would "still" be "a problem with disinfection," she did not say the same would be true of any figure between thirty and five. She went on to say that she did not "know how she would equate Jackson Turbidity Units (on which her relevant experience was based) with milligrams, . . . because you would have to know size, shape and all that, source, because of the test itself," and then said 5 mg/l "would be well in the ball park," and she "wouldn't want any more than five." This is a speculative and uncertain basis for the court's implied conclusion that effluent limitations specifically adopted by EPA and the Wisconsin agency are insufficient to protect the health of people more than 25 miles from the discharge points. See also note 49, *Supra*.

[**77]

51 Illinois Pollution Control Board Rules and Regulations, *Supra*, § 404.

52 In the statement of facts contained in Illinois' first brief we were told: "Not only does sewage provide the basic element of phosphorus (which is necessary for eutrophication), but also it contains a whole series of nutrients . . . 'a very rich nutrient broth' for aquatic plant growth (Tr. 2889)." Illinois does not, however, attempt to sustain the effluent limitations imposed by the district court on this basis. Indeed, it is not even clear that this "fact" is relevant to the effluent limitations. There does not appear to be any evidence as to the relative "nutrient" content of effluent from treatment works designed to meet the 30 mg/l suspended solids and BOD 5 standards and those designed to meet the 5 mg/l standards. Presumably, the nutrient content of effluent from a plant meeting the 5 mg/l standards is lower than that of a plant meeting the 30 mg/l standards. But whether the difference is significant with respect to eutrophication of Lake Michigan is not clear.

Also relevant to this aspect of the remedy [**78] is Congress' treatment of publicly-owned treatment facilities in the 1972 and 1977 amendments to FWPCA. Secondary treatment facilities, which are not capable of meeting the 5 mg/l limitations, are permitted under § 301(b)(1)(B) until July 1, 1983, when "the best practicable waste treatment over the life of the works" becomes the requirement. Although Congress did not attempt to answer the public health questions, leaving them to EPA and state agencies acting under EPA's supervision, the provisions of the Act are at least an indication of Congressional reluctance to risk pushing municipalities beyond the limits of their resources. The 1977 amendments, summarized above, show a deepening concern on this score. Congress' position in the Act does not, as we have held, mark the limits of our power in this common law nuisance action, but the policy underlying that position, to which we should give some deference, is at

least a reason not to allow the nature of the action to cause a relaxation of the requirements of [*177] evidentiary foundation that would normally be observed in other kinds of actions.⁵³

53 Plaintiff also relies on Illinois statutory and common law. The district court indicated that under any of the asserted grounds for relief the result would be the same. But it is federal common law and not state statutory or common law that controls in this case. *Illinois v. Milwaukee*, supra, 406 U.S. at 107 & n. 9, 92 S. Ct. 1385, and therefore we do not address the state law claims.

[**79] It is not clear whether the fecal coliform limitation and the free chlorine residual requirement imposed by the district court can be met with secondary treatment. In any event, the record support for these limitations is as deficient as it is for the suspended solid and BOD 5 limitations, and we are provided with no explanation of why such limitations were not included in the NPDES permits for the plants and the federal regulations.⁵⁴

54 In addition we note that Illinois' general effluent standard fecal coliform limitation is 400/100ml. See Illinois Pollution Control Board Rules and Regulations, Supra, § 405. The "water quality" fecal coliform limitation for Lake Michigan is 20/100 ml. Ill. Pollution Control Board Rules and Regs., Supra, § 206(d). For the effect of a more stringent water quality limitation than effluent limitation See id. § 201(a). There does not appear to be any effluent limitation specifically requiring a chlorine residual, either "free" or total.

Our treatment of the [**80] effluent limitations imposed in the district court's order is not inconsistent with our treatment of the overflow requirements of the order. First, and we think most important, the evidence presented supports the district court's finding that the defendants' discharges of raw sewage, whether diluted or not, pose a significant risk of injury to Illinois residents. Raw sewage contains vastly higher concentrations of pathogens than treated sewage. Millions of gallons of raw sewage are dumped into the water each year from the 239 overflow points on the defendants' sewage systems, most frequently during wet weather, but also during dry weather. Lake currents can and do sometimes carry the pathogens into Illinois waters close to shore.

Second, no one even attempts to justify such discharges as harmless or insignificant. As we have said, it is arguable that the Act itself prohibits discharges of raw sewage. The Wisconsin agency has taken steps to eliminate some overflows and to "correct" others although giving the defendants a longer time to take the necessary action than did the district court. But as stated above the defendants have conceded that compliance with the deadlines imposed by [**81] the court is feasible.

On the other hand, the evidence supporting the effluent limitations is weak, at best. They are more stringent than those required by Congress, EPA, and the Wisconsin discharge permit issuing agency. And there is no evidence as to why the limitations deemed adequate to protect the inhabitants in the vicinity of the discharges are inadequate to protect the residents of Illinois who are at least 25 miles away.

The phosphorus limitation imposed by the district court can be achieved using secondary treatment; an identical limitation is prescribed in the defendants' discharge permits.⁵⁵

55 Illinois' phosphorus effluent standard is 1 mg/l; its water quality standard for Lake Michigan is .007 mg/l. See Illinois Pollution Control Board Rules and Regulations, Supra, §§ 407, 206(c).

We affirm the district court's order to the extent that it requires the elimination of all sewage overflows and imposes a 1 mg/l phosphorus effluent limitation. We reverse the court's order insofar as it imposes [**82] suspended solids, BOD 5, fecal coliform, and free chlorine residual effluent limitations more stringent than those prescribed in defendants' discharge permits. The case is remanded to the district court with directions to modify the injunctive order in conformity with the rulings of this court.

Affirmed in part,

Reversed and remanded in part.