



## Chapter 13

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# Expert Opinions in Environmental Cases After *Daubert* and Amended Federal Rule 702<sup>1</sup>

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**§ 13.01. Introduction.<sup>2</sup>**

In 1993, the United States Supreme Court issued its landmark decision in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,<sup>3</sup> which made significant changes in the standards for admissibility of expert opinions in federal courts. An amendment to Federal Rule of Evidence 702, which became effective in December 2000, codified *Daubert's* general approach. Because environmental cases almost always involve scientific issues and expert opinions, *Daubert* and its progeny have had and will continue to have a major impact on environmental litigation.

**§ 13.02. The *Daubert* Standards.**

Rule 702 of the Federal Rules of Evidence governs the admissibility of expert opinions. The rule, in its original form, provided:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.<sup>4</sup>

In *Daubert*, the Supreme Court held that district court judges have a “gatekeeping role” to determine evidentiary reliability of scientific evidence before it is admitted, and redefined the requirements for admissibility of scientific evidence under Rule 702.

There are accordingly two distinct requirements enunciated in *Daubert*: (1) the procedural gatekeeping function for trial courts and (2) the newly defined substantive analysis for determining admissibility of scientific evidence. The gatekeeping function requires a preliminary

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<sup>2</sup> This chapter is adapted from unpublished course materials prepared by the authors for a course, “Environmental Litigation – Advanced Forensics and Legal Strategies,” presented by the University of Wisconsin - Madison, Department of Engineering in San Francisco, California in April, 2001. Parts of those materials were also used for courses for the Pennsylvania Bar Institute and the Allegheny County Bar Association Environmental Law Section.

<sup>3</sup> *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 113 S. Ct. 2786 (1993).

<sup>4</sup> Fed. R. Evid. 702.

assessment by the district court of the proffered opinions before they are admitted:

Faced with a proffer of expert scientific testimony, then, the trial judge must determine at the outset, pursuant to Rule 104(a), whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. *This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue.*<sup>5</sup>

Admissibility is based on a two-step analysis in which the trial court determines (1) whether the proffered expert opinion reflects scientific knowledge, whether the findings are derived by the scientific method and whether the work amounts to good science (*reliability*); and (2) whether the proffered expert opinion is relevant to the task at hand (*relevance*).<sup>6</sup>

For the first step in this analysis, the Supreme Court provided a list of nonexclusive factors, which it characterized as “general observations,” which a court should analyze in determining the reliability of scientific evidence:

1. whether the scientific theory or technique “can be (and has been) tested”;
2. whether the scientific theory or technique “has been subjected to peer review and publication”;
3. “the known or potential rate of error”;
4. “the existence and maintenance of standards controlling the technique’s operation”; and
5. “general acceptance” in the “relevant scientific community.”<sup>7</sup>

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<sup>5</sup> *Daubert* at 592-593, 113 S. Ct. at 2796. (Emphasis added). Fed. R. Evid. 104(a) governs determinations of preliminary questions concerning admissibility of evidence generally.

<sup>6</sup> Fed. R. Evid. 401-403 govern relevance generally. *E.g.*, *Smelser v. Norfolk Southern Ry. Co.*, 105 F.3d 299, 303 (6th Cir. 1997), *cert. denied*, 118 S. Ct. 67 (1997).

<sup>7</sup> *Daubert* at 593-594; 113 S. Ct. at 2796-2797. (Emphasis added).

The Supreme Court noted that reviewing courts, in applying the *Daubert* analysis, must focus “solely on [the expert’s] principles and methodology, not on the conclusions that they generate.”<sup>8</sup>

In adopting the *Daubert* analysis, the Supreme Court held that the more restrictive approach to admissibility of experts of *Frye v. United States*,<sup>9</sup> which had been followed in federal courts for years, was superseded by the adoption of the Federal Rules of Evidence. *Frye* focused on “general acceptance” by scientists in the particular field of the proposed expert opinions:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field to which it belongs.<sup>10</sup>

Under this test, the underlying scientific principle(s) and methodology employed must be generally accepted by the relevant scientific community.<sup>11</sup>

Significantly, the Supreme Court viewed the *Frye* test as overly restrictive and replaced it with the more flexible *Daubert* analysis. Because the new test is more flexible, a wider range of expert opinions should be admissible after *Daubert* than was previously admissible under *Frye*. However, because of the procedural gatekeeping function articulated by the Supreme Court, a *Daubert* analysis has often resulted in exclusion of the proffered expert opinion. In addition, some courts have incorrectly

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<sup>8</sup> *Daubert* at 595, 113 S. Ct. at 2797.

<sup>9</sup> *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

<sup>10</sup> *Id.* at 1014.

<sup>11</sup> Some courts, in applying *Frye*, have gone beyond this requirement and held that the methodology and the conclusion must both be generally accepted. *E.g.*, *Thomas v. The West Bend Co.*, 760 A.2d 1174, 1179 (Pa. Super. 2000), *appeal denied*, 2001 WL 501438 (Pa. 2001).

applied *Daubert's* “general observations” almost as a mandatory checklist for admissibility rather than as part of a flexible analysis.

### § 13.03. Application of *Daubert*.

#### [1] — United States Supreme Court.

The Supreme Court has decided *Daubert* issues twice since its original 1993 decision.<sup>12</sup> In *General Electric Co. v. Joiner*,<sup>13</sup> the Court held that the test for appellate review of admissibility of expert testimony was whether there was an abuse of discretion in admitting or excluding the expert testimony.<sup>14</sup>

Significantly, the Supreme Court also held that the gatekeeping function was not limited to evaluation of methodology, as it stated in *Daubert*, but also properly includes a review of the connection between the methodology and the expert's conclusions:

But conclusions and methodology are not entirely distinct from one another. . . . [N]othing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert. A court may conclude that there is simply too great an analytical gap between the data and the opinion offered.<sup>15</sup>

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<sup>12</sup> In addition, in *Weisgram v. Marley Co.*, 528 U.S. 440, 120 S. Ct. 1011 (2000), the U.S. Supreme Court held that a court of appeals may direct entry of judgment as a matter of law where it determines that evidence was erroneously admitted and that the remaining, properly admitted evidence was insufficient to support a verdict. The evidence which the Eighth Circuit found to have been erroneously admitted was expert testimony which the court found to be inadmissible under *Daubert*. The admissibility of the expert testimony was not an issue before the Supreme Court.

<sup>13</sup> *General Electric Co. v. Joiner*, 522 U.S. 136, 118 S. Ct. 512 (1997).

<sup>14</sup> Where the issue is whether or not the district court applied the proper legal standard under the Federal Rules of Evidence, review is plenary. Review of the district court's application of the correct legal standard is for abuse of discretion. *E.g.*, *Tormenia v. First Investors Reality Co.*, 251 F.3d 128, 134-135 (3d Cir. 2000).

<sup>15</sup> 522 U.S. at 146, 118 S. Ct. at 519.

Most recently, in *Kumho Tire Co., Ltd. v. Carmichael*,<sup>16</sup> the Supreme Court held that the *Daubert* analysis applies to all expert testimony based on “technical or other specialized knowledge” and was not limited to scientific opinions. With respect to technical opinions, however, the *Daubert* factors have to be adjusted to fit the facts of the particular case, with the goal of testing the reliability of the proffered expert opinion.<sup>17</sup> The Court noted that the *Daubert* factors were intended to be “helpful, not definitive” and that district courts have “considerable leeway in deciding in a particular case how to go about determining whether particular expert testimony is reliable.”<sup>18</sup> The specific *Daubert* factors are to be applied by a district court “. . . where they are reasonable measures of the reliability of expert testimony.”<sup>19</sup> The Court reiterated:

The objective of [*Daubert’s* gatekeeping requirement] is to ensure the reliability and relevancy of expert testimony. It is to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.<sup>20</sup>

## **[2] — Courts of Appeal and District Courts.**

The Advisory Committee Note to the recent amendment to Rule 702 contains a list of additional factors which federal courts have applied in determining the reliability of expert opinions:

(1) Whether experts are “proposing to testify about matters growing naturally and directly out of research they have conducted independent of the litigation, or whether they have developed their opinions expressly for purposes of testifying”;<sup>21</sup>

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<sup>16</sup> *Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 119 S. Ct. 1167 (1999).

<sup>17</sup> *Id.* at 149-151.

<sup>18</sup> *Id.* at 151-152 and 1175-1176.

<sup>19</sup> *Id.*

<sup>20</sup> *Id.*

<sup>21</sup> *Daubert v. Merrell Dow Pharm, Inc.*, 43 F.3d 1311, 1317 (9th Cir. 1995)(on remand).

(2) Whether the expert has unjustifiably extrapolated from an accepted premise to an unfounded conclusion;<sup>22</sup>

(3) Whether the expert has adequately accounted for obvious alternative explanations;<sup>23</sup>

(4) Whether that expert “is being as careful as he would be in his regular professional work outside his paid litigation consulting”; and<sup>24</sup>

(5) Whether the field of expertise claimed by the expert is known to reach reliable results for the type of opinion the expert would give.<sup>25</sup>

Applying these additional factors as part of a *Daubert* analysis, the Courts of Appeal for the Sixth Circuit and Ninth Circuit have held that particularly close scrutiny is required where expert opinions have been

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<sup>22</sup> See *General Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997)(noting that in some cases a trial court “may conclude that there is simply too great an analytical gap between the data and the opinion proffered”).

<sup>23</sup> See *Claar v. Burlington N. R.R.*, 29 F.3d 499 (9th Cir. 1994)(testimony excluded where the expert failed to consider other obvious causes for the plaintiff’s condition). Compare *Ambrosini v. Labarraque*, 101 F.3d 129 (D.C. Cir. 1996)(the possibility of some uneliminated causes presents a question of weight, so long as the most obvious causes have been considered and reasonably ruled out by the expert).

<sup>24</sup> *Sheehan v. Daily Racing Form, Inc.*, 104 F.3d 940, 942 (7th Cir. 1997). See *Kumho Tire Co. v. Carmichael*, 119 S. Ct. 1167, 1176 (1999)(*Daubert* requires the trial court assure itself that the expert “employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field”).

<sup>25</sup> See *Kumho Tire Co. v. Carmichael*, 119 S. Ct. 1167, 1175 (1999)(*Daubert*’s general acceptance factor does not “help show that an expert’s testimony is reliable where the discipline itself lacks reliability, as, for example, do theories grounded in any so-called generally accepted principles of astrology or necromancy.”); *Moore v. Ashland Chem., Inc.*, 151 F.3d 269 (5th Cir. 1998)(*en banc*)(clinical doctor was properly precluded from testifying to the toxicological cause of the plaintiff’s respiratory problem, where the opinion was not sufficiently grounded in scientific methodology); *Sterling v. Velsicol Chem. Corp.*, 855 F.2d 1188 (6th Cir. 1988)(rejecting testimony based on “clinical ecology” as unfounded and unreliable). Advisory Committee Note to 2000 Amendment to Rule 702.

developed for litigation, rather than in the regular practice of the expert's profession:

These factors are to assist the court in determining “whether the analysis undergirding the experts’ testimony falls within the range of accepted standards governing how scientists conduct their research and reach their conclusions.”<sup>26</sup>

The Ninth Circuit has added another factor to assist the court in its inquiry: “whether the experts are proposing to testify about matters growing naturally and directly out of research they have conducted independent of the litigation, or whether they have developed their opinions expressly for purposes of testifying” because the former “provides important, objective proof that the research comports with the dictates of good science.”<sup>27</sup>

The Ninth Circuit’s opinion in *Daubert* (on remand) explains this additional special scrutiny for litigation opinions:

One very significant factor to be considered is whether the experts are proposing to testify about matters growing naturally and directly out of research they have conducted independent of litigation, or whether they have developed their opinions expressly for purposes of testifying . . . *in determining whether proposed expert testimony amounts to good science, we may not ignore the fact that a scientist’s normal workplace is the lab or in the field, not the courtroom or lawyer’s office.*

\* \* \*

*If the proffered expert testimony is not based on independent research, the party proffering it must come forward with other objective, verifiable evidence that the testimony is based on scientifically valid principles.*<sup>28</sup>

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<sup>26</sup> *Daubert* (on remand), 43 F.3d at 1316.

<sup>27</sup> *Id.* at 1317; *Smelser*, 105 F.3d at 303 (quoting from *Daubert* on remand).

<sup>28</sup> *Daubert v. Merrell Dow Pharm., Inc.*, 43 F.3d 1311, 1317-1318 (9th Cir. 1995); *cert. denied*, 516 U.S. 869, 116 S. Ct. 189 (1995)(Quotation omitted)(Emphasis added).



Under this approach, the party seeking to have the expert opinion admitted has the burden of showing that the expert's conclusions are "based on sound science" which requires an "objective, independent validation of the expert's methodology."<sup>29</sup>

Experience alone may qualify a witness to testify as an expert if reliability of the opinion is established. The Advisory Committee Note to the 2000 Amendment recognizes that an expert may be qualified based on experience:

Nothing in this amendment is intended to suggest that experience alone – or experience in conjunction with other knowledge, skill, training or education – may not provide a sufficient foundation for expert testimony. To the contrary, the text of Rule 702 expressly contemplates that an expert may be qualified on the basis of experience. In certain fields, experience is the predominant, if not sole, basis for a great deal of reliable expert testimony.<sup>30</sup>

A recent district court case which analyzed an expert opinion based solely on the expert's knowledge and experience is *Pappas v. Sony Electronics, Inc.*,<sup>31</sup> a case involving the cause of a fire in a residence. In *Pappas*, the court excluded an electrical engineer's testimony concerning the cause of the fire where the engineer's opinions were based solely on his knowledge and experience and he failed to establish the reliability of his methodology. In rejecting the proffered opinion, the court observed:

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<sup>29</sup> *Smelser*, 105 F.3d at 303.

<sup>30</sup> *See, e.g.* *United States v. Jones*, 107 F.3d 1147 (6th Cir. 1997)(no abuse of discretion in admitting the testimony of a handwriting examiner who had years of practical experience and extensive training, and who explained his methodology in detail); *Tassin v. Sears Roebuck*, 946 F. Supp. 1241, 1248 (M.D. La. 1996)(design engineer's testimony can be admissible when the expert's opinions "are based on facts, a reasonable investigation, and traditional technical/mechanical expertise, and he provides a reasonable link between the information and procedures he uses and the conclusions he reaches"). *See also* *Kumho Tire Co. v. Carmichael*, 119 S. Ct. 1167, 1178 (1999)(stating that "no one denies that an expert might draw a conclusion from a set of observations based on extensive and specialized experience.").

<sup>31</sup> *Pappas v. Sony Electronics, Inc.*, 136 F. Supp. 2d 413 (W.D. Pa. 2000).

. . . In short, Brugger’s opinion is based on nothing more than his training and years of experience as a fire investigator and engineer. While there may be cases when experience and training alone provide an adequate foundation for an expert opinion under Rule 702, this is not one of them.<sup>32</sup> [FN16]

FN16. Before expert testimony grounded solely in knowledge and experience can be admissible under Rule 702, the expert must still prove that his methodology is reliable. In such cases, the expert may do so by: 1) discussing his experience and knowledge in detail; 2) explaining the methods he has used in the past; 3) indicating the success or failure that he has enjoyed in employing these methods; and 4) testifying about how he used the same methods in the investigation at issue. At the *Daubert* hearing, Brugger did not present this kind of detailed testimony.<sup>33</sup>

While *Daubert* was intended to make admissibility of expert testimony more flexible, it is often better known for excluding unreliable expert opinions as “junk science.” This is the case because district courts have been giving proffered expert testimony close scrutiny under the gatekeeping procedure which *Daubert* established. A survey of federal judges by the Federal Judicial Center in 1998 reported that “[j]udges were more likely to scrutinize expert testimony before trial and less likely to admit expert testimony in 1998 than in 1991.”<sup>34</sup> However, according to the Advisory Committee Note to Rule 702, acceptance of expert opinions, rather than exclusion, has generally been the result in cases applying *Daubert*:

A review of the caselaw after *Daubert* shows that the rejection of expert testimony is the exception rather than the rule. *Daubert* did not work a “seachange over federal evidence law,” and “the

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<sup>32</sup> See, e.g., *Oddi*, 234 F.3d at 157.

<sup>33</sup> 136 F. Supp. 2d at 425.

<sup>34</sup> Johnson *et al.*, “Expert Testimony in Federal Civil Trials, A Preliminary Analysis” Federal Judicial Center 2000, at page 1. Available at [www.fjc.gov](http://www.fjc.gov), under “Publications.”

trial court's role as gatekeeper is not intended to serve as a replacement for the adversary system."<sup>35</sup>

**[3] — Sources of Information.**

The Federal Judicial Center has prepared a *Reference Manual on Scientific Evidence* (2000), now in its second edition, to assist federal judges in managing scientific evidence. A copy of the manual is included in *Moore's Federal Practice*. It is also available on the Internet at [www.fjc.gov](http://www.fjc.gov), under "Publications." This manual is an important reference for attorneys proffering and opposing scientific evidence and for expert witnesses because it is an official publication used by federal judges.

Another helpful reference is *Scientific Evidence Review, Monograph No. 4* (1999), published by the American Bar Association Section of Science and Technology. This 466-page book includes a general analysis of *Daubert* and its progeny, as well as discussion of their application in each of the federal courts of appeals and each of the states.

Finally, the Committee Note to the 2000 Amendment to Rule 702 contains an overview of *Daubert* and the cases applying it.

On some occasions, federal courts have employed court-appointed expert witnesses, either to advise the court on expert issues or to actually testify at trial. Federal Rule of Evidence 706 governs court-appointed experts. The *Reference Manual on Scientific Evidence* (Second Edition) contains a discussion of court-appointed experts at pages 59 through 63, both under Rule 706 and under district courts' inherent powers.

In the fall of 1998, the American Academy for the Advancement of Science started a pilot program, *Court Appointed Scientific Experts*, to assist federal judges in obtaining independent scientific and technical experts. The project is designed to help judges locate highly qualified scientists and engineers to serve as experts for the courts, rather than for the litigants. Information on the project is available at [www.aaas.org/spp/case/case.htm](http://www.aaas.org/spp/case/case.htm).

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<sup>35</sup> *United States v. 14.38 Acres of Land Situated in Leflore County, Mississippi*, 80 F.3d 1074, 1078 (5th Cir. 1996). Advisory Committee Note to 2000 Amendment to Rule 702.

**§ 13.04. Amendment to Federal Rule 702.**

Rule 702 was amended, effective December 1, 2000, to codify the general approach adopted by the Supreme Court in *Daubert*. The original language of Rule 702 remains the same. Three specific requirements (in bold below) have been added to the rule:

**Rule 702. Testimony by Experts**

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

This amendment “affirms the trial court’s role as gatekeeper and provides some general standards the trial court must use to assess the reliability and helpfulness of proffered expert testimony.” It does not attempt to codify the specific *Daubert* factors enunciated by the Supreme Court as “general observations.” [Advisory Committee Note to 2000 Amendment to Rule 702.]

**§ 13.05. *Daubert* in the State Courts.**

Before the Supreme Court’s *Daubert* decision, most states applied the *Frye* test or similar tests to determine admissibility of expert testimony. State courts are now facing the issue of whether to adopt *Daubert* or stay with their established tests for admissibility of expert opinions. Some states have adopted the *Daubert* test (*e.g.*, Connecticut, Massachusetts and Texas)<sup>36</sup> while others continue to employ the *Frye* test, either because they have declined to adopt *Daubert* or have deferred decision on the

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<sup>36</sup> See, *State v. Porter*, 698 A.2d 739 (Conn. 1997); *cert. denied*, 118 S. Ct. 1384 (1998); *Commonwealth v. Lanigan*, 641 N.E.2d 1342 (Mass. 1994); *E.I. duPont de Nemours and Co. v. Robinson*, 923 S.W.2d 549 (Tex. 1995).

issue (*e.g.*, Illinois, Minnesota and New York).<sup>37</sup> Still other states have their own tests which differ from both *Daubert* and *Frye* (*e.g.*, Delaware, South Carolina and Wisconsin).<sup>38</sup> This section reviews the approaches recently taken by Pennsylvania, Michigan, West Virginia and Kentucky in deciding this issue. Pennsylvania and Michigan courts have continued to use the *Frye* test, although Michigan has adopted a *Daubert* approach by statute for personal injury and property damages cases. Kentucky and West Virginia courts have adopted the *Daubert* approach.

### [1] — Pennsylvania Courts.

The recently adopted Pennsylvania Rules of Evidence include Pa.R.E. 702 which is modeled on Federal Rule 702, with some variation. The Comment to Pa.R.E. 702 expressly notes:

Adoption of Pa.R.E. 702 does not alter Pennsylvania's adoption of the standard in *Frye v. United States*,<sup>39</sup> which requires scientific evidence to have "general acceptance" in the relevant scientific community. . . . Pennsylvania courts have not yet decided whether the rationale in *Daubert* supercedes or modified the *Frye* test in Pennsylvania.<sup>40</sup>

The Pennsylvania Superior Court and the Pennsylvania Commonwealth Court (both intermediate appellate courts) have held that the *Frye* test, rather than the *Daubert* test, continues to apply in Pennsylvania.<sup>41</sup>

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<sup>37</sup> See, *People v. Miller*, 670 N.E.2d 721 (Ill. 1997), *cert. denied*, 117 S. Ct. 1338 (1997)(deferring decision); *State v. Klawitter*, 518 N.W.2d 577 (Minn. 1994); *People v. Wesley*, 633 N.E.2d 451 (N.Y. 1994).

<sup>38</sup> See, *Nelson v. Delaware*, 628 A.2d 69 (Del. 1993)(state's own five-step analysis); *State v. Dinkins*, 462 S.E.2d 59 (S.C. 1995)(state's own reliability and relevance test); *State v. Peters*, 534 N.W.2d 867 (Wis. Ct. App. 1995) *review denied*, 537 N.W.2d 572 (Wis. 1995)(limited relevancy and qualification test; reliability is determined by the fact finder).

<sup>39</sup> *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

<sup>40</sup> *Commonwealth v. Crews*, 536 Pa. 508, n.2, 640 A.2d 395 (1994).

<sup>41</sup> *Wack v. Farmland Indus., Inc.*, 744 A.2d 265 (Pa. Super. Ct. 1999)(storage tank case involving exposure to benzene, applied *Frye*); *Checcio v. Frankford Hospital*, 717

The superior court recently applied a *Frye* analysis in *Thomas v. The West Bend Co.*,<sup>42</sup> a personal injury case in which the plaintiff claimed that his cardiomyopathy was caused by low voltage electric shock from an appliance. The trial court found that the proffered medical causation evidence was not generally accepted in the relevant medical community and excluded it.

In affirming, the superior court applied an abuse of discretion standard.<sup>43</sup> The court held:

1. *Frye* applies to all “science” entered into the courtroom; not only to novel scientific evidence;<sup>44</sup>
2. Admissibility under *Frye* requires both the causal relationship and methodology to be generally accepted in the relevant scientific community; general acceptance of the methodology alone is insufficient; and<sup>45</sup>
3. The proponent of expert testimony has the burden of establishing its admissibility and is responsible for insuring that the certified record contains the evidence offered in support of admissibility.<sup>46</sup>

Significantly, under *Thomas*, *Blum*, and the Commonwealth Court’s *McKenzie*, decision, the expert’s methodology and conclusions must both

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A.2d 1058, 1060 (Pa. Super. 1998); *Blum v. Merrell Dow Pharm., Inc.*, 705 A.2d 1314, 1317, n.2 (Pa. Super. 1997), *aff’d*, 764 A.2d 1 (2000)(applying *Frye*, reversed trial court admission of epidemiological evidence where neither methodology nor conclusions was generally accepted); *McKenzie v. Westinghouse Electric Co.*, 674 A.2d 1167, 1172 n.4 (Pa. Commw. 1996) *alloc. denied*, 547 A.2d 733 (Pa. 1997)(case involving exposure to TCE, excluded expert opinion on effect of exposure, where expert used generally accepted principles and methodology, but conclusions were not generally accepted).

<sup>42</sup> *Thomas v. The West Bend Co.*, 760 A.2d 1174 (Pa. Super. Ct. 2000), *appeal denied*, 2001 WL 501438 (Pa. 2001).

<sup>43</sup> *Id.* at 1177-1178.

<sup>44</sup> *Id.* at 1178-1179.

<sup>45</sup> *Id.* at 1179.

<sup>46</sup> *Id.* at 1180.

be generally accepted in the relevant scientific community for the opinions to be admissible.

The Pennsylvania Supreme Court recently addressed the issue of the applicability of the *Daubert* test in Pennsylvania in the *Blum* case and deferred decision on the issue. After agreeing with the superior court that the proffered expert testimony would be inadmissible under either *Daubert* or *Frye*, the Pennsylvania Supreme Court concluded that a choice between the two standards was unnecessary to the resolution of the appeal.<sup>47</sup> As a result, the *Frye* test remains the applicable test in Pennsylvania courts.

### [2] — Michigan Courts.

Michigan courts also continue to generally apply the *Frye* test rather than the *Daubert* test for the admissibility of expert testimony. Michigan refers to its test as the *Davis-Frye* test.<sup>48</sup>

The Michigan Court of Appeals decision in *Nelson v. American Sterilizer Co.*,<sup>49</sup> however, appears to be a departure from this general rule. There, the court placed no express reliance on the *Davis-Frye* test. Rather, in applying Michigan Rule of Evidence 702, it cited to *Daubert* and applied a broad standard of reliability based on the holdings in numerous federal cases.

In 1999, the Michigan Court of Appeals again addressed the issue in *Anton v. State Farm Mutual Automobile Ins. Co.*<sup>50</sup> Though the court cited heavily to the opinion in *Nelson*, it maintained that it was applying the *Davis-Frye* test for admitting expert testimony.<sup>51</sup> The court expressly declined to address the continued applicability of the *Davis-Frye* test under Michigan law.<sup>52</sup> However, the court noted that Michigan Rule of Evidence 702, “unlike its federal counterpart, incorporates a ‘recognized’ standard

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<sup>47</sup> See *Blum v. Merrell Dow Pharm., Inc.*, 764 A.2d 1 (Pa. 2000).

<sup>48</sup> See *People v. McMillan*, 539 N.W.2d 553, 555 (Mich. App. 1995)(declining to apply *Daubert* absent a ruling by the Michigan Supreme Court displacing *Davis-Frye*).

<sup>49</sup> *Nelson v. American Sterilizer Co.*, 566 N.W.2d 671, 673-674 (Mich. App. 1997).

<sup>50</sup> *Anton v. State Farm Mut. Auto. Ins. Co.*, 607 N.W.2d 123, 127 (Mich. App. 1999).

<sup>51</sup> *Id.*

<sup>52</sup> *Id.* at 127.

for the admissibility of scientific evidence.”<sup>53</sup> This language appears to refer to a variation of the “general acceptance” required under the *Frye* test.

It is notable that, in 1996, the Michigan Legislature passed a law specifying the factors which a court must consider in determining whether to admit expert testimony in actions for the death of a person or for injury to a person or property.<sup>54</sup> In *Greathouse v. Rhodes*,<sup>55</sup> the Michigan Court of Appeals noted that, in passing § 600.2955(1), the Legislature apparently intended to codify the holding in *Daubert*.

### [3] — West Virginia Courts.

In contrast to courts in Michigan and Pennsylvania, West Virginia courts uniformly apply the *Daubert* test in analyzing the admissibility of expert testimony. The West Virginia Supreme Court expressly adopted *Daubert* in *Wilt v. Buracker*.<sup>56</sup> In large part, the court’s adoption of *Daubert* may be attributed to the fact that West Virginia Rule of Evidence 702 and its federal counterpart are identical.

A West Virginia trial court applying the *Daubert/Wilt* test initially considers whether the testimony is based on an assertion or inference derived from scientific methodology:<sup>57</sup>

Further assessment should then be made in regard to the expert’s reliability by considering its underlying scientific methodology and reasoning. This includes an assessment of (a) whether the scientific theory in its conclusion can be and have been tested; (b) whether the scientific theory has been subject to peer review in publications; (c) whether the scientific theory’s actual or potential rate of error is known; and (d) whether the scientific theory is generally accepted within the scientific community.<sup>58</sup>

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<sup>53</sup> *Id.* 607 N.W.2d at 127 n.3. Michigan Rule of Evidence 702 begins with “If the court determines that *recognized* scientific, technical or other specialized knowledge will assist the trier of fact . . .” (Emphasis added).

<sup>54</sup> See M.C.L. § 600.2955(1)(1996).

<sup>55</sup> *Greathouse v. Rhodes*, 618 N.W.2d 106, 115 (Mich. App. 2000).

<sup>56</sup> *Wilt v. Buracker*, 443 S.E.2d 196 (W. Va. 1993), *cert. denied*, 114 S. Ct. 2137 (1994).

<sup>57</sup> See *Wilt*, *supra*, at 203.

<sup>58</sup> *Id.* at 203.



In *Gentry v. Mangum*,<sup>59</sup> the West Virginia Supreme Court held that the *Daubert/Wilt* test applied only to admissibility of scientific evidence. *Gentry* predated the U.S. Supreme Court's extension of the *Daubert* analysis in 1999 in *Kumho Tire* to all expert opinion based on "technical or other specialized knowledge." Subsequent to *Kumho Tire*, the West Virginia Supreme Court, in *West Virginia Div. of Highways v. Butler*,<sup>60</sup> declined to apply the *Daubert/Wilt* analysis to a valuation expert's testimony. It is at least questionable whether the West Virginia courts will extend *Daubert/Wilt* beyond scientific opinions.

#### [4] — Kentucky Courts.

As in West Virginia, Rule 702 of the Kentucky Rules of Evidence is identical to Federal Rule 702. Noting that Federal Rule of Evidence 702 superceded the previously observed *Frye* test, the Kentucky Supreme Court has departed from *Frye* and applied the *Daubert* analysis.<sup>61</sup> Now, under Kentucky law, "a trial judge [determining the admissibility of expert testimony] must conduct a preliminary hearing on the matter utilizing the standards set forth in *Daubert*."<sup>62</sup>

It bears further note that the Supreme Court of Kentucky has recently held that the reliability of two methods of DNA analysis, polymerase chain reaction (PCR) and restriction fragment length polymorphism (RFLP), has been sufficiently established.<sup>63</sup> Thus, such DNA evidence is *per se* admissible and trial courts are not required to undertake a *Daubert* analysis as to such evidence.<sup>64</sup>

#### § 13.06. *Daubert* in Federal Environmental Cases.

The *Daubert* standards have been applied by federal courts in a number of environmental cases in the last few years. For the most part, the courts

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<sup>59</sup> *Gentry v. Mangum*, 466 S.E. 2d 171 (W. Va. 1995).

<sup>60</sup> *West Virginia Div. of Highways v. Butler*, 526 S.E.2d 769 (W. Va. 1999).

<sup>61</sup> *See Mitchell v. Commonwealth*, 908 S.W.2d 100, 101 (Ky. 1995), overruled on other grounds in *Fugate v. Commonwealth*, 993 S.W.2d 931 (Ky. 1999).

<sup>62</sup> *Id.* at 102.

<sup>63</sup> *Fugate v. Commonwealth*, 993 S.W.2d at 937.

<sup>64</sup> *See id.*

have applied a straightforward *Daubert* analysis. Some recent examples from courts of appeal include *U.S. v. Dico, Inc.*,<sup>65</sup> *Gussack Realty Co. v. Xerox Corp.*,<sup>66</sup> *NutraSweet Co. v. X-L Engineering Co.*,<sup>67</sup> *St. Martin v. Mobil Exploration & Producing US, Inc.*,<sup>68</sup> *Dodge v. Cotter Corp.*,<sup>69</sup> *U.S.*

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<sup>65</sup> *Gussack Realty Co. v. Xerox Corp.*, 2001 U.S. App. LEXIS 20584 (8th Cir.) (bench trial in action by the U.S. government to recover response costs incurred for the cleanup of contaminated groundwater; the court affirmed the district court's refusal to preclude an expert's testimony where the defendant's objections to admission went, not to the reliability of the testimony, but rather amounted to nothing more than an argument that the district court should have given more weight to the defendant's expert's interpretation of the data at issue.).

<sup>66</sup> *Gussack Realty Co. v. Xerox Corp.*, 224 F.3d 85 (2d Cir. 2000) (property owner's CERCLA suit for damages arising out of alleged contamination of plaintiff's property from defendant's copier refurbishing plant; the court affirmed the district court's conclusion that experts may rely on data which they did not personally collect, including data collected by an opposing party's experts.).

<sup>67</sup> *NutraSweet Co. v. X-L Engineering Co.*, 227 F.3d 776, 787-790 (7th Cir. 2000) (suit by property owner alleging that plaintiff's property was contaminated by improper disposal of VOCs on the adjoining property; the court affirmed the district court's conclusion that analysis of historical photographs is a well-accepted technique so as to bear a sufficient indicia of reliability; the photographic analysis was used by plaintiff's environmental expert to confirm opinions based on solvent degradation (speciation), chemical chromatography and groundwater migration analysis which were not challenged on *Daubert* grounds.).

<sup>68</sup> *St. Martin v. Mobil Exploration & Producing US, Inc.*, 224 F.3d 402 (5th Cir. 2000), *reh. denied*, 234 F.3d 31 (5th Cir. 2000) (action by property owners against oil companies for damage to marshes from alleged failure to maintain spoil banks on canals; ecology expert qualified to testify based on years of experience and personal observations; *Daubert* factors are nonexclusive and need not be rigidly applied in every case.).

<sup>69</sup> *Dodge v. Cotter Corp.*, 203 F.3d 1190 (10th Cir. 2000) (CERCLA class action involving contamination of a semi-rural community as a result of defendant's operation of a uranium mill; the court noted that its holding in the case mooted several other issues including those concerning expert testimony, yet admonished the district court to make detailed findings to fulfill its gatekeeping role under Rule 702, particularly in light of the novelty of the medical causation theory linking exposure to molybdenum with osteoarthritis and bony exostoses.).

*v. Cunningham*,<sup>70</sup> *Kalamazoo River Study Group v. Rockwell Int'l. Corp.*,<sup>71</sup> and *Burns Philip Food, Inc. v. Cavalea Continental Freight, Inc.*<sup>72</sup>

District Court cases include *Seneca Meadows, Inc. v. ECI Liquidating, Inc.*,<sup>73</sup> *Freeport-McMoran Resource Partners L.P. v. B-B Paint Corp.*,<sup>74</sup> *U.S. v. Lightman*,<sup>75</sup> *State of New York v. Almy Brothers, Inc.*,<sup>76</sup> *U.S. v.*

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<sup>70</sup> *U.S. v. Cunningham*, 194 F.3d 1186 (11th Cir. 1999)(criminal RCRA case in which the defendant was convicted of conspiracy and illegal transportation and disposal of hazardous waste; affirmed trial court's exclusion of defense expert witness who based his opinion on an unproven test method, was unfamiliar with applicable regulations and disagreed with EPA's regulatory determination that barium was a hazardous waste).

<sup>71</sup> *Kalamazoo River Study Group v. Rockwell Int'l Corp.*, 171 F.3d 1065 (6th Cir. 1999)(two-site case where PCBs released at one site were alleged to have traveled through a ditch and river to a second site; affirmed exclusion of expert opinion, where district court found that expert's opinion was based on "speculation, conjecture and possibility" and that "the inadequate factual basis makes [the] affidavit scientifically unreliable"). See also district court opinion at 3 F. Supp. 2d 815 (W.D. Mich. 1997).

<sup>72</sup> *Burns Philip Food, Inc. v. Cavalea Continental Freight, Inc.*, 135 F.3d 526 (7th Cir. 1998)(claim of contamination of land from diesel fuel on adjacent property; affirmed exclusion of environmental expert's opinions which district court found to be based on inadequate investigation and testing).

<sup>73</sup> *Seneca Meadows, Inc. v. ECI Liquidating, Inc.*, 121 F. Supp. 2d 248, 252-254 (W.D.N.Y. 2000)(landfill case against generator defendants; court denied summary judgment where there were conflicting affidavits as to whether a defendant's wastes were hazardous; the defendant did not challenge plaintiff's expert's methodology, but claimed factual errors underlying his analysis; the court found that the opinions were admissible and that the fact issues would be best addressed by cross-examination and presentation of contrary evidence at trial).

<sup>74</sup> *Freeport-McMoran Resource Partners L.P. v. B-B Paint Corp.*, 56 F. Supp. 2d 823 (E.D. Mich. 1999)(excluding expert opinions and granting summary judgment in a waste transshipment case – discussed below).

<sup>75</sup> *U.S. v. Lightman*, 87 F. Supp. 2d 359 (D.N.J. 1999)(suit to identify the parties which should bear the cost of cleaning up environmental contamination caused by illegal dumping of hazardous waste; the district court held that an expert's modification of its original allocation of shares of liability for remediation costs was too speculative, arbitrary, and not based on any recognized methodology where the modification was founded on an assumption, unsupported by the record, that increasing the areal distribution of site contaminants by a factor of two would increase site costs by a factor of two).

*SCA Services of Indiana, Inc.*,<sup>77</sup> and *Thomas v. FAG Bearings Corp.*<sup>78</sup> Environmental Protection Agency Administrative Decisions include *In the Matter of: City of Salisbury, Maryland*.<sup>79</sup>

### [1] — Federal Cases — A Closer Look.

This section reviews in more detail three examples, including an environmental case admitting a challenged expert opinion, an environmental case rejecting a proposed expert opinion, and a toxic court case involving groundwater issues which are typical in environmental cases.

In *St. Martin v. Mobil Exploration & Producing US, Inc.*,<sup>80</sup> the defendant oil companies challenged on appeal the testimony of an expert

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<sup>76</sup> *State of New York v. Almy Bros., Inc.*, 1998 WL 57666, 46 E.R.C. (BNA) 1339 (N.D.N.Y. 1998)(third-party contribution claim against prior owner-operator of a milk processing facility; third-party plaintiff admitted that she had no direct evidence of disposal of hazardous substances by dairy operator; district court held that opinions of a geologist and environmental engineer, both with substantial experience in remediation, concerning the likelihood of contamination from operation of a milk processing facility and absence of contamination from plaintiff's operations was sufficient to preclude summary judgment).

<sup>77</sup> *U.S. v. SCA Services of Indiana, Inc.*, 1995 WL 569634 (N.D. Ind. 1995)(waste disposal site; expert's opinion excluded based on lack of foundation for conclusion that all products in the involved class contain the same hazardous constituents).

<sup>78</sup> *Thomas v. FAG Bearings Corp.*, 846 F. Supp. 1382 (W.D. Mo. 1994)(CERCLA case in which the defendant claimed that third party defendants contributed to TCE contamination in groundwater; court excluded expert opinions which it found to be "concocted of impermissible bootstrapping of speculation upon conjecture"; speculation that contamination entered groundwater and, if it did, that it traveled to involved area; "no information available to say with any degree of certainty that contaminants went from point 'A' to point 'B'").

<sup>79</sup> *In the Matter of: City of Salisbury, Maryland*, Docket No. CWA-III-219, 2000 EPA ALJ 9 (February 8, 2000)(proceeding for violations of the sludge regulation provisions of the Clean Water Act; the administrative law judge rejected the respondent's contention that digesters were not inhibited; expert opinion supporting it was not reliable considering the absence of full testing and the potential rate of error).

<sup>80</sup> *St. Martin v. Mobil Exploration & Producing US, Inc.*, 224 F.3d 402 (5th Cir. 2000), *reh. denied*, 234 F.3d 31 (5th Cir. 2000).

retained by the plaintiff landowners in a suit for damages allegedly caused to the freshwater flotant marsh ecosystem on the landowners' property. The defendants maintained that the expert, a specialist in the ecology of the region, failed all the non-exclusive *Daubert* factors and should not have been accepted as an expert on hydrology.<sup>81</sup> Specifically, the defendants asserted that the expert was not a trained hydrologist, had not published any article relating to his hypothesis, relied on a hypothesis that had not been subject to peer review, and had conducted no tests to verify his hypothesis.<sup>82</sup>

The circuit court, noting that the *Daubert* factors are non-exclusive and that district courts enjoy wide latitude in determining the admissibility of expert testimony, disagreed.<sup>83</sup> The circuit court found no abuse of discretion in the district court's conclusion that the expert's expertise in marshland ecology, and in the erosion of vegetative mats in particular, in conjunction with his personal observations, sufficiently qualified him to testify as an expert as to the dynamics within the subject flotant marsh.<sup>84</sup> Moreover, the circuit court held that the expert's general understanding of dynamics within flotant marshes, as well as his substantial on-site observations, were indices properly considered by the district court in its conclusion that the expert's testimony was both reliable and relevant.<sup>85</sup>

In *Kalamazoo River Study Group v. Rockwell Int'l Corp.*,<sup>86</sup> the circuit court affirmed the district court's award of summary judgment in favor of one of the defendants in a cost recovery action in connection with the cleanup of a contaminated portion of the Kalamazoo River. In asserting the existence of an issue of material fact, the plaintiff association of paper companies essentially relied on the affidavit testimony of one expert who

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<sup>81</sup> *See id.* at 405.

<sup>82</sup> *See id.* at 405.

<sup>83</sup> *See St. Martin*, 224 F.3d at 406.

<sup>84</sup> *See id.* at 405.

<sup>85</sup> *See id.* at 406-07.

<sup>86</sup> *Kalamazoo River Study Group v. Rockwell Int'l Corp.*, 171 F.3d 1065 (6th Cir. 1999).

concluded that there was a possibility that the defendant had contributed to the contamination.<sup>87</sup>

In its opinion, the district court recognized that it “may, indeed must, look beyond the conclusions [of the experts] to determine whether the expert testimony rests on a reliable foundation.”<sup>88</sup> Examining those factual underpinnings, the district court concluded that, at most, the opinion of the plaintiff’s expert presented an issue of material fact as to the *possibility* that the subject contaminants may have flowed from the defendant’s facility down a drainage ditch to the contaminated site.<sup>89</sup> The district court determined that the expert’s conclusion was based on speculation, conjecture, and possibility and that such an inadequate factual basis rendered the expert’s conclusions unreliable.<sup>90</sup> The circuit court affirmed summary judgment in favor of the defendant, concurring with the district court’s conclusion that the existence of a possibility does not create an issue of material fact for trial where the plaintiff bears the burden of proof to show that the defendant contributed to contamination.<sup>91</sup>

*Ramsey v. Consolidated Rail Corp.*,<sup>92</sup> while a toxic tort case, involves hydrogeology issues which are typical for environmental cases. Plaintiffs claimed that they were exposed to contaminated drinking water in their well which was caused by releases of volatile organic compounds, including trichloroethene (“TCE”), at defendants’ rail yard.

Plaintiffs’ proposed expert was a hydrologist who offered the opinion that the contamination migrated from the rail yard to groundwater supplying plaintiffs’ well. For the most part, the expert relied on generally accepted methodology, including groundwater flow modeling, and the court found that this aspect of his opinion “. . . passes the Daubert inquiry with flying colors . . . .”<sup>93</sup>

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<sup>87</sup> *See id.*

<sup>88</sup> *Kalamazoo River Study Group*, 171 F.3d at 1072 quoting *Daubert*, 509 U.S. 579, 113 S. Ct. 2786.

<sup>89</sup> *See id.* at 1072.

<sup>90</sup> *Id.*

<sup>91</sup> *Id.*

<sup>92</sup> *Ramsey v. Consolidated Rail Corp.*, 111 F. Supp. 2d 1030 (N.D. Ind. 2000).

<sup>93</sup> *Id.* at 1036-1037.

However, the court rejected the final step in the expert's opinion. This was a conclusion that plaintiffs had been exposed to TCE in their drinking water despite the fact that all samples of plaintiffs' well and wells between plaintiffs' well and the rail yard were nondetect for TCE. These samples which were nondetect included a number of samples by EPA.<sup>94</sup> In rejecting the proffered opinion, the court observed:

Many cases decided under *Daubert* have excluded opinion testimony from experts who ignored facts or considerations that must be considered under methods based on reliable principles. (Citations omitted.) Dr. Haitjema didn't ignore the non-detect tests. He explained why those tests didn't prove that TCE never reached [plaintiffs'] well. But the record contains no explanation as to how any scientific principle supports the contrary opinion in the face of eight years of non-detect results in and immediately around the [plaintiffs'] well.<sup>95</sup>

The court accordingly granted a motion to strike the proffered opinion and entered summary judgment for defendants.

## **[2] — A Relaxed Standard for Environmental Cases?**

While most federal environmental cases have applied a straightforward *Daubert* analysis, two cases contain language which suggests that a more liberal standard may apply to admissibility of expert opinions in environmental cases because of the remedial nature of the environmental laws. *B. F. Goodrich v. Betkowski*,<sup>96</sup> a CERCLA case involving disposal at a landfill, has language which supports this approach. The court notes: “[e]nvironmental science, like epidemiology ‘is ill suited to lead a fact finder toward definitive answers, dealing as it does in statistical probabilities.’” In effect, the court seems to say that environmental science, like epidemiology, is a “soft science” and that a more liberal analysis should apply to admissibility of expert opinions in these fields.

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<sup>94</sup> *Id.* at 1032-1036.

<sup>95</sup> *Id.* at 1033.

<sup>96</sup> *B. F. Goodrich v. Betkowski*, 99 F.3d 505 (2d Cir. 1996), *cert. denied*, 118 S. Ct. 2318 (1998).

If this is what the court intended, it is not supported by *Daubert* and a majority of the cases decided under it. The Supreme Court's decisions in *Daubert* and *Joiner* both involved epidemiology issues. Further, numerous circuit court and district court cases have applied a standard *Daubert* analysis to epidemiology issues. As the cases above demonstrate, most courts have also applied a standard *Daubert* analysis to environmental cases. A close review of the expert opinions and supporting bases in *B. F. Goodrich* suggests that it could have been decided the same way under a standard *Daubert* analysis. The court found that the expert's opinions were supported by sufficient research, including EPA publications.

In *F. P. Woll & Co. v. Fifth & Mitchell Street Corp.*,<sup>97</sup> the district court followed *B. F. Goodrich* and used similar language concerning the application of *Daubert* in environmental cases.

In *Freeport-McMoran*,<sup>98</sup> the court rejected a relaxed standard for admissibility of expert opinions in environmental cases.

### § 13.07. *Freeport-McMoran/Forest Waste: A Case Study.*

*Freeport-McMoran*<sup>99</sup> is a recent example of the application of *Daubert* to proffered expert opinions in an environmental case. The court excluded the proposed expert testimony and granted summary judgment for defendants.<sup>100</sup>

The case is a CERCLA contribution action involving a claim of transshipment of waste from one National Priorities List (NPL) site (the Berlin & Farro site) to a second NPL site (the Forest Waste site). The plaintiff is a generator at the Forest Waste site which settled with EPA and agreed to participate in remediation of the Forest Waste site as a part of a PRP (potentially responsible party) group. The defendants are generators who were alleged to have sent drummed waste to the Berlin &

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<sup>97</sup> *F. P. Woll & Co. v. Fifth & Mitchell Street Corp.*, 1999 U.S. Dist. LEXIS 874, 48 E.R.C. (BNA) 1362 (E.D. Pa. 1999).

<sup>98</sup> *Freeport-McMoran*, 56 F. Supp. 2d at 833-834.

<sup>99</sup> *Id.*, 56 F. Supp. 2d 823, *supra*.

<sup>100</sup> David Ries, one of the authors of these materials, argued the *Daubert* motion for a defense group of 12 defendants.



Farro site, a waste incineration facility. Defendants settled with EPA for contamination at the Berlin & Farro site.

Plaintiff claimed that some of the drummed waste which defendants sent to the Berlin & Farro site was not incinerated there but, instead, was transshipped to the Forest Waste site. EPA and the PRP group at Forest Waste decided not to bring claims against the Berlin & Farro generators relating to the Forest Waste site.

The plaintiff had no evidence that any of defendant's drummed wastes were disposed of at the Forest Waste site. Instead, plaintiff attempted to prove indirectly that defendants' drummed waste was transshipped from the Berlin & Farro site to the Forest Waste site for disposal.

Plaintiff's theory was as follows:

1. Each defendant arranged for the disposal of drummed waste at the Berlin & Farro site;
2. Each defendants' drummed waste that arrived at the Berlin & Farro site contained solid materials;
3. After the liquids were drained or pumped from each defendants' drums at Berlin & Farro, residual solids remained;
4. Each defendants' drums containing residual solids were transshipped from Berlin & Farro to the Forest Waste site; and
5. The residual solids remaining in each defendants' drums which were transshipped to the Forest Waste site contained hazardous substances like those present at the Forest Waste site.

Plaintiff originally retained the expert to review each defendants' waste stream to express opinions as to CERCLA hazardous substances which they contained. In order to develop plaintiff's transshipment theory, plaintiff later requested the expert to provide an opinion as to the presence of a solid component in each defendant's waste.

Plaintiff's expert had a Ph.D. in chemistry, taught at a small college for several years, and then worked at EPA in the fields of CERCLA and RCRA for several years. He then became a litigation consultant and served as an expert witness in over 183 cases, primarily for the federal government.

The expert studied the available materials about each defendants' waste streams and expressed opinions which were essentially carbon copies as to each of the defendants:

1. That each defendants' waste contained some solids;
2. That the solids would settle by gravity, to the bottom of the drums in which they were stored;
3. That some residual solids would remain in the drums when the overlying liquids were poured or decanted at Berlin & Farro; and
4. That the residual solids contained hazardous substances of the type found at the Forest Waste Site.

The evidence, however, established that every effort was made to completely drain the drums at Berlin & Farro by pouring out their contents or pumping them out. Only drums which still contained too much solid material after this process for the drums to be recycled were disposed of onsite or at one of several landfills. Most drums were sold to drum recyclers.

There was no evidence that any of the defendants' drums contained too much solid material for the drums to be recycled. The expert did not express any opinions on quantities of solid materials in any defendants' drums.

What was missing from the expert's analysis, *inter alia*, was any fact evidence or opinion that drums which contained some unspecified quantities of residual solids would be transshipped to Forest Waste, rather than being recycled.

After the close of discovery, including a two-day deposition of plaintiff's expert, plaintiff filed a motion for summary judgment with a supporting affidavit of plaintiff's expert. Defendants filed a motion to strike the expert opinions, along with cross-motions for summary judgment. The district court granted defendants' motions. In excluding the proffered expert opinions, the court found:

The proposed opinions were "utterly lacking in any indicia that would establish any of the *Daubert* factors";

The only source for substantiation of the expert's theories was his own "experience"; and

The opinions were unreliable because they were based on a misunderstanding of the facts.<sup>101</sup>

The *Daubert* analysis is contained at pages 832 through 837 of this lengthy opinion.

**§ 13.08. Conclusion.**

In federal courts, admissibility of expert opinions is now governed by Fed. R. Evid. 702 which requires that the expert opinion must be based on (1) sufficient facts and data, (2) reliable principles and methods, and (3) reliably applied principles and methodology. Reliability is measured by a flexible analysis described in *Daubert* and the subsequent cases applying *Daubert*. This analysis serves both to exclude "junk science" and unreliable opinions and to permit admission of reliable opinions which have not yet reached general acceptance. Expert opinions must also be relevant to the issues in dispute. Similar considerations apply in state courts which have adopted *Daubert*.

In states which continue to apply the *Frye* analysis, admissibility of expert opinions requires general acceptance of the expert's principles and methodology in the relevant scientific community. Some courts also require general acceptance of the conclusions as well as the methodology. Finally, some jurisdictions apply the *Frye* test to all expert opinions while others limit its application to novel scientific evidence.

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<sup>101</sup> 56 F. Supp. 2d at 832-837.