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for the Third Circuit

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Filed May 12, 1997

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

NO. 95-2098

IN RE: PAOLI RAILROAD YARD PCB LITIGATION

MABEL BROWN, Individually and on behalf of all others
similarly situated

v.

SOUTHEASTERN PENNSYLVANIA TRANSPORTATION
AUTHORITY ("SEPTA"); NATIONAL RAILROAD
PASSENGER CORPORATION ("AMTRAK"); AND
CONSOLIDATED RAIL CORPORATION ("CONRAIL")

v.

UNITED STATES OF AMERICA; ROY F. WESTON, INC.;
and OH MATERIALS COMPANY; and GENERAL ELECTRIC
COMPANY; and THE BUDD COMPANY; and
WESTINGHOUSE ELECTRIC CORPORATION; and
MONSANTO CO.; PENN CENTRAL CORPORATION
(D.C. Civil No. 86-cv-02229)

GEORGE ALBERT BURRELL; and PRISCILLA ETHERIDGE
BURRELL, in their own right, and GEORGE ALBERT
BURRELL and PRISCILLA ETHERIDGE BURRELL, as
parents and natural guardian of AMBER SHARDAI
BURRELL, a minor, and GEORGE ALBERT BURRELL, as
parent and natural guardian of ANDRE WALKER, a
minor, and PRISCILLA ETHERIDGE BURRELL, as parent
and natural guardian of BOBBY GEORGE ALBERT
CHRISTIAN BURRELL, a minor

v.

SOUTHEASTERN PENNSYLVANIA TRANSPORTATION
AUTHORITY ("SEPTA"); and NATIONAL RAILROAD
PASSENGER CORPORATION ("AMTRAK") and
CONSOLIDATED RAIL CORPORATION ("CONRAIL")

v.

UNITED STATES OF AMERICA; MONSANTO COMPANY;
GENERAL ELECTRIC COMPANY; THE BUDD COMPANY;
WESTINGHOUSE ELECTRIC CORPORATION

v.

PENN CENTRAL CORPORATION
(D.C. Civil No. 86-cv-02235)

K. LOUISE JONES, ADMINISTRATRIX OF THE ESTATE
OF HARVEY N. JONES, JR., DECEASED; and K. LOUISE
JONES, AS PERSONAL REPRESENTATIVE OF HARVEY N.
JONES, JR., and K. LOUISE JONES, IN HER OWN RIGHT

v.

SOUTHEASTERN PENNSYLVANIA TRANSPORTATION
AUTHORITY ("SEPTA"); NATIONAL RAILROAD
PASSENGER CORPORATION ("AMTRAK"); CONSOLIDATED
RAIL CORPORATION ("CONRAIL")

v.

UNITED STATES OF AMERICA; CITY OF PHILADELPHIA;
MONSANTO COMPANY; GENERAL ELECTRIC COMPANY;
THE BUDD COMPANY; and WESTINGHOUSE ELECTRIC
CORPORATION; PENN CENTRAL CORPORATION
(D.C. Civil No. 86-cv-05277)

JAMES LAMENT, individually and on behalf of all others
similarly situated

v.

SEPTA; AMTRAK; and CONRAIL

v.

PENN CENTRAL CORPORATION; UNITED STATES OF
AMERICA: CITY OF PHILADELPHIA

v.

MONSANTO CO.; GENERAL ELECTRIC CO.; BUDD CO.;
and WESTINGHOUSE ELECTRIC CORP.
(D.C. Civil No. 86-cv-05886)

CHRISTOPHER S. BROWN;
JACQUELINE MICHELL BROWN, h/w

v.

MONSANTO COMPANY; SOUTHEASTERN PENNSYLVANIA
TRANSPORTATION AUTHORITY ("SEPTA"); NATIONAL
RAILROAD PASSENGER CORPORATION; CONSOLIDATED
RAIL CORPORATION ("CONRAIL")

v.

PENN CENTRAL CORPORATION; UNITED STATES OF
AMERICA; CITY OF PHILADELPHIA; GENERAL ELECTRIC
CO.; THE BUDD COMPANY; WESTINGHOUSE ELECTRIC
CORPORATION
(D.C. Civil No. 86-cv-07414)

CATHLENE BROWN

v.

MONSANTO COMPANY; SOUTHEASTERN PENNSYLVANIA
TRANSPORTATION AUTHORITY ("SEPTA"); NATIONAL
RAILROAD PASSENGER CORPORATION ("AMTRAK");
CONSOLIDATED RAIL CORPORATION ("CONRAIL")

v.

UNITED STATES OF AMERICA; CITY OF PHILADELPHIA;
GENERAL ELECTRIC COMPANY; THE BUDD COMPANY;
WESTINGHOUSE ELECTRIC CORPORATION

v.

PENN CENTRAL CORPORATION
(D.C. Civil No. 86-cv-07415)

CRAIG A. BROWN; and CATHERINE D. BROWN, h/w

v.

MONSANTO COMPANY; SOUTHEASTERN PENNSYLVANIA
TRANSPORTATION AUTHORITY ("SEPTA"); NATIONAL
RAILROAD PASSENGER CORPORATION ("AMTRAK"); AND
CONSOLIDATED RAIL CORPORATION ("CONRAIL")

v.

UNITED STATES OF AMERICA; PENN CENTRAL
CORPORATION; and CITY OF PHILADELPHIA; GENERAL
ELECTRIC CO.; THE BUDD CO.; and WESTINGHOUSE
ELECTRIC CORP.
(D.C. Civil No. 86-cv-07416)

MARGHERITA BARBETTA

v.

MONSANTO COMPANY; SOUTHEASTERN PENNSYLVANIA
TRANSPORTATION AUTHORITY ("SEPTA"); NATIONAL
RAILROAD PASSENGER CORPORATION ("AMTRAK"); and
CONSOLIDATED RAIL CORPORATION ("CONRAIL")

v.

UNITED STATES OF AMERICA; and CITY OF
PHILADELPHIA; THE GENERAL ELECTRIC COMPANY;
and THE BUDD COMPANY; and WESTINGHOUSE
ELECTRIC CORPORATION

v.

PENN CENTRAL CORPORATION
(D.C. Civil No. 86-cv-07417)

MARY RETTA JOHNSON

v.

MONSANTO COMPANY; SOUTHEASTERN PENNSYLVANIA
TRANSPORTATION AUTHORITY ("SEPTA"); NATIONAL
RAILROAD PASSENGER CORPORATION ("AMTRAK") and
CONSOLIDATED RAIL CORPORATION ("CONRAIL")

v.

UNITED STATES OF AMERICA; THE CITY OF
PHILADELPHIA; and GENERAL ELECTRIC COMPANY;
THE BUDD COMPANY; and WESTINGHOUSE ELECTRIC
CORPORATION; and PENN CENTRAL CORP.
(D.C. Civil No. 86-cv-07418)

CELESTE BROWN

v.

MONSANTO COMPANY; SOUTHEASTERN PENNSYLVANIA
TRANSPORTATION AUTHORITY ("SEPTA"); NATIONAL
RAILROAD PASSENGER CORPORATION ("AMTRAK"); and
CONSOLIDATED RAIL CORPORATION ("CONRAIL")

v.

UNITED STATES OF AMERICA; CITY OF PHILADELPHIA;
and GENERAL ELECTRIC COMPANY; THE BUDD
COMPANY; WESTINGHOUSE ELECTRIC CORPORATION
(D.C. Civil No. 86-cv-07419)

CLEMMON L. BROWN

v.

MONSANTO COMPANY; SOUTHEASTERN PENNSYLVANIA
TRANSPORTATION AUTHORITY ("SEPTA"); NATIONAL
RAILROAD PASSENGER CORPORATION ("AMTRAK"); and
CONSOLIDATED RAIL CORPORATION ("CONRAIL")

v.

UNITED STATES OF AMERICA; CITY OF PHILADELPHIA;
and GENERAL ELECTRIC COMPANY; THE BUDD
COMPANY; and WESTINGHOUSE ELECTRIC
CORPORATION; and PENN CENTRAL CORPORATION
(D.C. Civil No. 86-cv-07420)

CLOYD H. BROWN

v.

MONSANTO COMPANY; SOUTHEASTERN PENNSYLVANIA
TRANSPORTATION AUTHORITY ("SEPTA"); NATIONAL
RAILROAD PASSENGER CORPORATION ("AMTRAK"); and
CONSOLIDATED RAIL CORPORATION ("CONRAIL")

v.

UNITED STATES OF AMERICA; CITY OF PHILADELPHIA;
GENERAL ELECTRIC COMPANY; THE BUDD COMPANY;
WESTINGHOUSE ELECTRIC CORPORATION; PENN
CENTRAL CORPORATION
(D.C. Civil No. 86-cv-07421)

CURTIS BROWN

v.

MONSANTO COMPANY; SOUTHEASTERN PENNSYLVANIA
TRANSPORTATION AUTHORITY ("SETPA"); NATIONAL
RAILROAD PASSENGER CORPORATION ("AMTRAK"); and
CONSOLIDATED RAIL CORPORATION ("CONRAIL")

v.

UNITED STATES OF AMERICA; CITY OF PHILADELPHIA;
GENERAL ELECTRIC COMPANY; and THE BUDD
COMPANY; and WESTINGHOUSE ELECTRIC COMPANY;
PENN CENTRAL CORP.
(D.C. Civil No. 86-cv-07422)

JOHN INGRAM SR. and PATRICIA INGRAM, in their own
right and as parents and natural guardians of JOHN
INGRAM JR.; and APRIL INGRAM, in her own right

v.

SOUTHEASTERN PENNSYLVANIA TRANSPORTATION
AUTHORITY ("SEPTA"); and NATIONAL RAILROAD
PASSENGER CORPORATION ("AMTRAK"); and
CONSOLIDATED RAIL CORPORATION ("CONRAIL"); and
MONSANTO COMPANY ("MONSANTO"); and GENERAL
ELECTRIC COMPANY ("GE"); and CITY OF PHILADELPHIA
("PHILADELPHIA")

v.

UNITED STATES OF AMERICA; THE BUDD COMPANY;
WESTINGHOUSE ELECTRIC CORPORATION; PENN
CENTRAL CORPORATION
(D.C. civil No. 86-cv-07561)

WILLIAM BUTLER; THERESA BUTLER; MARVIN L.
SIMPSON; ALLEN K. SIMPSON; KAREN R. SIMPSON;
DONALD E. SIMPSON; and BRYAN M. JACKSON

v.

SOUTHEASTERN PENNSYLVANIA TRANSPORTATION
AUTHORITY ("SEPTA"); NATIONAL RAILROAD
PASSENGER CORPORATION ("AMTRAK"); and
CONSOLIDATED RAIL CORPORATION ("CONRAIL")

v.

UNITED STATES OF AMERICA; CITY OF PHILADELPHIA;
MONSANTO COMPANY; GENERAL ELECTRIC COMPANY;
THE BUDD COMPANY; WESTINGHOUSE ELECTRIC
CORPORATION; PENN CENTRAL CORPORATION
(D.C. Civil No. 87-cv-02874)

MATTHEW CUNNINGHAM; and BESSIE CUNNINGHAM

v.

MONSANTO COMPANY; and SOUTHEASTERN
PENNSYLVANIA TRANSPORTATION AUTHORITY ("SEPTA")
and NATIONAL RAILROAD PASSENGER CORPORATION
("AMTRAK"); and CONSOLIDATED RAIL CORPORATION
("CONRAIL")

v.

GENERAL ELECTRIC COMPANY; THE BUDD COMPANY;
WESTINGHOUSE ELECTRIC CORPORATION; PENN
CENTRAL CORPORATION
(D.C. Civil No. 87-cv-05269)

Margherita Barbetta, Mabel Brown, Cathlene Brown,
Celeste Brown, Christopher Brown, Clemmon Brown, Cloyd
Brown, Craig Brown, Curtis Brown, William Butler, Theresa
Butler, Bessie Cunningham, John Ingram, Sr., John
Ingram, Jr., April Ingram Robinson-Ray, Mary Retta
Johnson, K. Louise Jones, Karen Simpson, Alan Simpson,
Marvin Simpson, Donald Simpson, Bryan Jackson, George
Burrell, Priscilla Burrell, individually and as natural
guardians for Amber Burrell and Monica Hilton and
James Lament,
Appellants

On Appeal From the United States District Court
For the Eastern District of Pennsylvania

Argued: September 16, 1996

Before: BECKER, NYGAARD, and ROTH, Circuit Judges.

(Filed May 12, 1997)

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OPINION OF THE COURT

BECKER, Circuit Judge.

This toxic tort case is before us for the third time. See In re Paoli Railroad Yard PCB Litig., 916 F.2d 829 (3d Cir. 1990) ("Paoli I"); In re Paoli Railroad Yard PCB Litig., 35 F.3d 717 (3d Cir. 1994), cert. denied, 115 S. Ct. 1253 (1995) ("Paoli II"). The plaintiffs have lived for many years in the vicinity of the Paoli Railroad Yard ("Yard"), a railcar maintenance facility at which polychlorinated biphenyls ("PCBs") were used in profusion for over a quarter-century. They sued the corporations that have maintained the Yard and sold the PCBs, seeking to recover damages for a variety of physical ailments and for property damage. Plaintiffs now appeal from the judgment entered after an unfavorable jury verdict on the claims that remained for trial in the wake of the previous appeals.

Plaintiffs present a plethora of appellate issues, several of which are significant enough to justify still another

published opinion: whether the district court abused its discretion in its exclusion of evidence offered by the plaintiffs regarding heat-degraded PCBs, and whether the court gave erroneous jury instructions dealing with the "significant exposure" element of the plaintiffs' medical monitoring and their property damage claims. The other questions presented are not of sufficient substance or difficulty to merit discussion here, especially given the length of our previous published opinions in the case,¹ and hence we resolve them summarily.²

1. The district court has also published an opinion. See In re Paoli Railroad Yard PCB Litig., 706 F. Supp. 358 (E.D. Pa. 1988).

2. We find the following claims of the plaintiffs to be patently without merit:

(1) the district court should have granted plaintiffs' motion seeking recusal pursuant to 28 U.S.C. § 455;

(2) the district court erred in excluding photographs of EPA employees wearing protective gear, evidence of remedial efforts taken by the railroad, an EPA report relating to the Paoli site, and an internal memorandum written by an EPA staff member; and

(3) the district court erred in admitting the defendants' untimely report regarding a trend analysis of real estate values.

Moreover, in Frankel v. Burke's Excavating, Inc., 397 F.2d 167 (3d Cir. 1968), we explained that, if there are jury interrogatories that make it clear which issues the jury found dispositive, evidentiary arguments that relate to other matters cannot be the cause of any prejudice to the plaintiff. Frankel applies here. The jury resolved the plaintiffs' medical monitoring claims in favor of the defendants on the threshold element of the claim -- whether the plaintiffs were significantly exposed to PCBs. Because, as the succeeding discussion demonstrates, the plaintiffs have not demonstrated reversible error infecting the jury's determination that they had not been significantly exposed to PCBs, we need not consider the plaintiffs' evidentiary objections that relate to other elements of their medical monitoring claim, including their contentions that:

(1) the district court erred in excluding Dr. Barsotti's deposition testimony;

(2) the court erred in limiting the rebuttal testimony of plaintiffs' expert Dr. LeWitt and in excluding the rebuttal testimony of plaintiffs' expert Dr. Nicholson; and

(3) the district court erred in admitting charts offered by defendants' expert Dr. Whysner, and in excluding charts offered by plaintiffs' expert Dr. Nisbet.

Plaintiffs also challenge the district court's decision to bifurcate the trial. We resolve this issue in favor of the defendants infra at n.5.

We resolve the remaining questions as follows:

(1) We will affirm the district court's exclusion of evidence offered by the plaintiffs regarding heat-degraded PCBs. The district court correctly determined that evidence related to heat-degraded PCBs fell within the ambit of its previous order excluding evidence related to plaintiffs' exposure to furans under Fed. R. Evid. 403, which was affirmed by this Court in Paoli II, 35 F.3d at 781-82. Furthermore, even if heat-degraded PCBs are a chemical substance distinct from furans, the district court did not abuse its discretion by excluding such evidence under Rule 403.

(2) We will affirm the district court's instructions on the "significant exposure" element of plaintiffs' medical monitoring claim. The court instructed the jury that plaintiffs must prove that they were exposed to PCBs at a level greater than that ordinarily encountered in everyday life. These instructions comport with this Court's description of the medical monitoring cause of action, the elements of which we explicated in Redland Soccer Club, Inc. v. Dept. of the Army, 55 F.3d 827 (3d. Cir. 1995), cert. denied, 116 S. Ct. 772 (1996). In affirming on this point, we make clear that Paoli II, 35 F.3d at 771 n.36, does not require a different result. We did remark in the Paoli II footnote that, in a personal injury or medical monitoring action, a plaintiff may be able to survive a motion for summary judgment, even if he or she was not exposed to a greater level of PCBs than was present in the background area; however, when making this statement, as the footnote makes clear, we were contemplating the unique situation in which defendants expose the entire population in a geographic area to high levels of contaminants, so that the level of contaminants that the plaintiff ordinarily encounters is extraordinarily high as a result of the defendants' traceable activities. Plaintiffs adduced no such evidence here.

(3) We will affirm the district court's instructions regarding the plaintiffs' property damage claims. We conclude that, when it instructed the jury that the property damage must be "actual," the district court did not

improperly convey that the damage need be permanent in order to be compensable.

Because we resolve all issues in favor of the defendants, the judgment in their favor will be affirmed.

I. RELEVANT FACTS AND PROCEDURAL HISTORY

The background facts are stated comprehensively in Paoli II. For our present purposes we make only the following relatively brief account. The Paoli Railroad Yard has long stored and handled PCBs, which are fire-resistant insulating fluids used in railroad car transformers. In the mid-1980s, the EPA documented relatively high levels of PCBs in the soil in the Yard and the nearby water and land. As a result of litigation under the Comprehensive Environmental Response Compensation and Liability Act, 42 U.S.C. § 9601, et. seq., Amtrak, Conrail, and SEPTA, all of which owned or operated the Yard at various times since 1976, entered into a series of consent decrees with the United States pursuant to which the PCB exposure in the Yard was monitored and controlled. In July 1992, the EPA issued a Record of Decision (ROD), which mandates extensive excavation and treatment of soils at the Yard and in the adjacent residential area, and erosion controls at the Yard.³ As of the time of oral argument, the required soil excavation or treatment had not been completed.

The plaintiffs are individuals who have lived for many years in the vicinity of the Yard in areas identified by the EPA and by the railroad defendants' contractor as having experienced the most severe PCB-laden run-off. The plaintiffs have adduced evidence of significant levels of PCBs in the soil surrounding their homes, on which some of them played and in which some of them gardened.

3. The ROD calls for: (1) the excavation and treatment of residential soil that contains PCBs in excess of 2 ppm; (2) the erection of new erosion controls to further reduce water runoff from the Yard to nearby properties; and (3) prohibition of any future residential or agricultural use of the Yard. In 1992, the EPA noted that 35 residential properties had composite samples that exceeded 5 ppm PCBs, either in the front or back yards or in the garden-soil.

Plaintiffs also regularly traversed the Yard on foot, as they were given open access to the Yard prior to the mid-1980's.

In 1986, thirty eight plaintiffs brought suit in the District Court for the Eastern District of Pennsylvania against the owners and operators of the Yard, and against Monsanto Company, the manufacturer of PCBs in the United States, and General Electric Company, a manufacturer of railroad-car transformers in which the PCBs were used. Some plaintiffs sought recovery for present injuries allegedly caused by exposure to PCBs and other assorted chemicals from the Yard, including polychlorinated dibenzo furans ("furans") and polychlorinated dibenzo-p-dioxins ("dioxins"). Some plaintiffs brought claims for emotional distress caused by fear of future injury, and for medical monitoring designed to decrease the chances of future illness. Finally, some plaintiffs brought claims for the decrease in value of their property caused by the presence (or reputed presence) of PCBs on the land.

After our decision in Paoli I reversing the grant of summary judgment for the defendants on the grounds that the district court had not conducted an in limine hearing on evidentiary issues, plaintiffs submitted a list of expert witnesses, which included Melvyn Kopstein, Ph.D., who was proffered to testify about plaintiffs' exposure to PCBs from the Yard; Ian C.T. Nisbet, Ph.D., who was proffered to testify about plaintiffs' exposure to PCBs; and Janette Sherman, M.D., who was proffered to testify that PCBs had caused plaintiffs' injuries and that plaintiffs require medical monitoring to detect and treat future PCB-related illnesses. At the close of discovery, defendants moved in limine to exclude these experts' opinions under Fed. R. Evid. 702, 703, and 403. On the same grounds, the defendants also filed motions in limine to preclude the plaintiffs' experts from testifying about evidence concerning the harm of dioxins and furans (chemicals sometimes present in transformer fluids), and evidence concerning the "Yusho" incident in Japan and the "Yu Cheng" incident in Taiwan, in which many individuals suffered adverse effects after consuming rice oil contaminated with PCBs and furans. Defendants also moved for summary judgment on all of plaintiffs' claims.

After holding five days of in limine hearings, in which Drs. Kopstein, Nisbet, and Sherman testified for the plaintiffs and ten scientists testified for the defendants, the district court entered orders excluding the opinions of all but one of the plaintiffs' experts. The court also excluded under Rule 403 evidence concerning dioxins and furans, and the Yusho and Yu Cheng incidents. The court then granted summary judgment against the plaintiffs on both their personal injury and medical monitoring claims on the grounds that they had adduced no evidence of exposure to the PCBs, or of causation. The district court also granted summary judgment for the defendants on the plaintiffs' property damage claims on the grounds that plaintiffs could not prove that they had suffered permanent property damage in light of the EPA's proposed cleanup plan.

In Paoli II, we affirmed most aspects of the judgment, but we also reversed in part and remanded for further proceedings. In reviewing the admissibility of expert opinions, we applied the admissibility standards enunciated in Daubert v. Merrell Dow Pharmaceuticals, Inc., 113 S. Ct. 2768 (1993), which the Supreme Court decided after the district court's rulings. We held that, as to all but two of the plaintiffs, the court did not abuse its discretion in excluding the testimony of plaintiffs' experts that PCBs had caused their (alleged) injuries. We reversed the district court's exclusion from evidence of Dr. Sherman's opinion with respect to the causation of injuries to Bessie Cunningham and Amber Burrell, two plaintiffs whom she actually examined and whose medical histories she took. 35 F.3d at 765-70. We also affirmed the district court's exclusion of expert opinion concerning the effect of dioxins and furans and testimony related to the Yusho and Yu Cheng incidents. We further held that, in the absence of Dr. Sherman's opinion on causation, the district court had properly granted summary judgment for defendants with respect to the personal injury claims of 31 of 33 plaintiffs (excluding Bessie Cunningham and Amber Burrell, leaving their tort claims for trial). Id. at 770-71.

We also held that the district court had erred in excluding as unreliable the opinions of experts who testified that plaintiffs needed medical monitoring as a result of

their alleged exposure to PCBs. Id. at 789-91. Those opinions, we noted, were "not seriously challenged" by defendants in the in limine hearing, and passed Daubert muster. Id. at 795. Accordingly, we reversed the grant of summary judgment on the medical monitoring claims. Id.

Finally, we reversed the grant of summary judgment for the defendants with respect to plaintiffs' claim for diminution of property value. We predicted that Pennsylvania would allow recovery where the property sustains at least temporary physical damage, repairs will not restore the value of the property to the prior level, and there is some ongoing risk to land. In sum, the following claims remained in the litigation after Paoli II: the medical monitoring claims of 26 plaintiffs; the personal injury claims of two plaintiffs; and the property damage claims of ten plaintiffs.⁴

Following Paoli II, and exercising its discretion under Federal Rule of Civil Procedure 42(b), the district court ordered that the trial would proceed in two phases. Phase I would involve the "issues of exposure, causation, medical monitoring, and property damages." If a jury returned a verdict favorable to the plaintiffs, Phase II would determine the defendants' liability for all claims, and the amount, if any, of punitive damages.

Prior to trial, defendants had moved in limine to exclude all the plaintiffs' evidence pertaining to heat-degraded PCBs and the heating process that produced them on the grounds: (1) that the evidence was covered by the court's prior order excluding evidence of dioxins and furans, which this Court affirmed in Paoli II; and (2) that, at all events, the evidence presented the same Rule 403 problems as had evidence of dioxins and furans. The court heard argument on the motion but reserved judgment until trial. During the course of testimony, plaintiffs proffered evidence on three separate occasions related to heat-degraded PCBs, which they alleged to be more toxic than "new PCBs" that had not been heated. In each instance, defendants challenged the evidence on the same grounds that they had advanced at

4. During the subsequent trial, the district court granted the motion for voluntary dismissal of the tenth property damage claim.

the in limine hearing. In each instance, the court agreed with the defendants and ordered plaintiffs to refrain from referring to "heating" or heat-degraded PCBs.

After thirteen days of Phase I testimony, consisting primarily of expert opinion, the jury returned a verdict for defendants on all claims. In response to special interrogatories, the jury found that none of the plaintiffs had been "significantly exposed" to PCBs from the Yard; that plaintiffs Bessie Cunningham and Amber Burrell had not sustained injuries as a result of PCB exposure; and that PCBs from the Yard had not damaged the plaintiffs' properties. Phase II therefore never took place. This appeal followed. We have jurisdiction pursuant to 28 U.S.C. § 1291.5

5. The plaintiffs contend that the district court's bifurcation of the trial violated their right to trial by jury as guaranteed by the Seventh Amendment because the jury would have to make foreseeability determinations when considering the causation issues of Phase I, whereas a different jury would have to make the same determinations when considering the negligence issues of Phase II. The record before us does not suggest that the district court actually considered summoning a different jury to hear the trial of Phase II, should Phase II have been necessary, and we fail to see why it would have. Moreover, the jury found for the defendants on all counts in Phase I, and because we will affirm the district court here, a second jury will not be convened. Under these circumstances, the issue would appear to be moot. At all events, the district court acted within its discretion when it ordered the bifurcation of the suit.

Fed. R. Civ. P. 42(b) authorizes district courts to bifurcate lawsuits into separate trials "in furtherance of convenience or to avoid prejudice," or when separate trials "will be conducive to expedition and economy." 9 Charles Alan Wright, Arthur R. Miller, & Edward H. Cooper, Federal Practice and Procedure § 2387 (1995). Severance of the question of liability from other issues can "reduce the length of trial, particularly if the severed issue[s] [are] dispositive of the case, and can also improve comprehension of the issues and evidence." Manual for Complex Litigation, Third § 21.632, at 119 (West 1995). In the case at bar, the interests of judicial economy and convenience counseled strongly in favor of severing the issues relating to plaintiffs' exposure to PCBs and causation of their injuries from the issues of defendants' culpability. Phase I focused on plaintiffs' exposure to PCBs while Phase II would have concerned whether the conduct of several railroad operators and manufacturers caused that exposure. The trial of the Phase I issues

II. THE RULE 403 ISSUE

A.

Fed. R. Evid. 403 provides in pertinent part that "[a]lthough relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of

alone lasted three weeks and involved dozens of witnesses. Resolution of the Phase I issues obviated the need for a trial on the issues of the defendants' liability, which undoubtedly would have taken months and would have involved issues more complicated than the Phase I trial, all at additional cost to the parties. Thus, bifurcation preserved judicial resources and reduced the expenses of the parties, and the district court did not abuse its discretion in ordering such a process. See In re Bendectin Litig., 857 F.2d 290, 309-314 (6th Cir. 1988) (issues of causation tried separately from issues of defendant's tortious conduct); In re Beverly Hills Fire Litig., 695 F.2d 207, 216-17 (6th Cir. 1982) (upholding severance of liability issues from causation issues).

Even if a second trial on the liability issues had been conducted before a different jury, the district court's bifurcation of the case would not appear to have offended the Seventh Amendment. The Seventh Amendment requires that, when a court bifurcates a case, it must "divide issues between separate trials in such a way that the same issue is not reexamined by different juries." In the Matter of Rhone-Poulenc Rorer, Inc., 51 F.3d 1293, 1303 (7th Cir.), cert. denied, 133 L.Ed.2d 122 (1995); McDaniel v. Anheuser-Busch, Inc., 987 F.2d 298, 304-05 (5th Cir. 1993) ("the Seventh Amendment guarantee of a trial by the jury is the general right of a litigant to have only one jury pass on a common issue of fact") (citations omitted). Plaintiffs argue that both Phase I causation issues and Phase II negligence issues would require the jury to make foreseeability determinations. We disagree. The first jury did not determine the foreseeability of plaintiffs' alleged or prospective injuries, and instead determined only whether the plaintiffs were exposed to PCBs and injured from that exposure. The district court did not instruct the jury on foreseeability, neither the plaintiffs nor the defendants requested an instruction on that issue, and the jury interrogatories did not refer to the foreseeability of the alleged harms. Nor does the fact that certain evidentiary items might have been relevant to both phases of trial require us to reverse the district court on this point, for the Seventh Amendment "prohibition is not against having two juries review the same evidence, but rather against having two juries decide the same essential issues." In re Innotron Diagnostics, 800 F.2d 1077, 1086 (Fed. Cir. 1986).

unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence." In making a Rule 403 determination, the court must balance the genuine need for the challenged evidence against the risk that the information will confuse the jury and delay trial. United States v. Sriyuth, 98 F.3d 739, 747-48 (3d Cir. 1996).

A district court's decision to admit or exclude evidence is reviewed for abuse of discretion. Paoli II, 35 F.3d at 749. A ruling excluding evidence under Rule 403 is accorded particular deference, and, provided that the court has explained its ruling or the reasons for its ruling are "otherwise apparent from the record," United States v. Murray, 103 F.3d 310, 318 (3d Cir. 1997) (quoting United States v. Himmelwright, 42 F.3d 777, 781 (3d Cir. 1994)), it may not be reversed unless the determination is "arbitrary and irrational." Bhaya v. Westinghouse Elec. Corp., 922 F.2d 184, 187 (3d Cir. 1990) (citing United States v. DePeri, 778 F.2d 963, 973-74 (3d Cir. 1985)); United States v. Long, 574 F.2d 761, 767 (3d Cir. 1978) ("If judicial self-restraint is ever desirable, it is when a Rule 403 analysis of a trial court is reviewed by an appellate tribunal.").

B.

During the in limine process following the initial remand (Paoli II), plaintiffs proffered evidence about dioxins and furans, which they contend could have been produced at the Yard when PCB-containing transformer fluids were heated, and also evidence of the Yusho and Yu Cheng poisoning incidents in which furans may have caused injuries. Acting on defendants' motion, the district court excluded all evidence concerning these chemicals as irrelevant under Rule 401 and unduly confusing and prejudicial under Rule 403. Specifically, the district court noted that the evidence would require defendants to "defend against a substance to which the Plaintiffs cannot prove they were exposed; confuse and complicate the issues for trial ..., confuse and mislead the jury ..., result in undue delay and wasting of time consumed in the presentation of irrelevant evidence at trial; and prejudice the Defendants by

permitting inflammatory evidence concerning substances such as dioxin as to which there is much public sensitivity and fear."

In Paoli II, we affirmed the district court's rulings. Although we found that the district court had impermissibly excluded the evidence as irrelevant under the lenient standard of Rule 401, we ruled that the court had not abused its discretion in ruling the evidence inadmissible under Rule 403. 35 F.3d at 781-84. In so holding, we took cognizance of the fact that there was evidence in the record that various heat-producing activities occurred at the Yard, and that dioxins and furans may have been produced as a result. However, we agreed with the district court that, in light of the paucity of the evidence that plaintiffs were exposed to dioxins and furans, admitting evidence about those chemicals would have required time-consuming mini-trials on the minimally relevant issues of plaintiffs' alleged exposure to the chemicals and the effects of that exposure. Id. at 783. We also noted that furans and dioxins were alleged to be significantly more dangerous than PCBs and had received negative publicity, and therefore "would have been too inflammatory for the jury," given their minimal relevance. Id.

Notwithstanding our affirmance of the district court's prior orders, plaintiffs sought on remand to proffer evidence of heat-degraded PCBs. Prior to trial, the district court heard argument from plaintiff regarding heat-degraded PCBs, but postponed judgment on admissibility. Plaintiffs attempted to proffer evidence about heat-degraded PCBs several times during trial. First, the plaintiffs' engineering expert testified that fires at the Yard created "chemicals ... present in heat degraded PCB transformer oils." The defendants objected that the testimony was an impermissible allusion to dioxins and furans, and the district court sustained the objection. Plaintiffs made no proffer as to what additional testimony the witness would have given on the subject.

The issue arose a second time before the direct examination of plaintiffs' expert Dr. Nisbet. After the district court ruled that Dr. Nisbet could testify about increases in

toxicity caused by the "weathering" of PCBs in the environment, plaintiffs requested that Dr. Nisbet be permitted to testify that "over-heated transformer fluid" existed in the dirt at the Yard. Defendants objected that the only significance of the overheating of PCB fluid would be the generation of dioxins and furans. Plaintiffs' only response was that "[t]here will be no mention of furans, no mention of dioxins." The court then instructed the plaintiffs not to "refer to heating." Plaintiffs did not represent what Dr. Nisbet would have said about heated PCB fluid, except that it was present in the dirt at the Yard.

The third episode arose after defendants questioned plaintiffs' expert Dr. Calesnick about the conclusion contained in Dr. Nicholson's meta-analysis, which analyzed deaths among PCB-exposed workers, that PCBs "pose minimal harm to health." Plaintiffs requested that the jury be read another sentence from the same analysis stating that PCBs "may be contaminated with more toxic polychlorinated hydrocarbons (e.g. polychlorinated dibenzofurans, PCDFs)," a passage that plaintiffs imply pertained to heat-degraded PCBs. The district court sustained defendants' objection to the evidence on the ground that the proffered text referred to contaminants previously excluded by the court.⁶

Plaintiffs argue that the district court incorrectly interpreted its previous order regarding furans and dioxins, affirmed by this Court in Paoli II, as mandating the exclusion of evidence pertaining to heat-degraded PCBs. According to the plaintiffs, although heat-degraded PCBs are of the same toxicity as dioxins and furans, they are chemically distinct and remain part of the PCB family. Furthermore, they contend that in order to explain the

6. Plaintiffs contend that the "rule of completeness" embodied in Fed. R. Evid. 106 compelled admission of the additional portion of the text. Rule 106 requires admission of those portions of writing that "ought in fairness to be considered." See United States v. Soures, 736 F.2d 87, 91 (3d cir. 1984). But the very premise of the district court's determination to exclude evidence of furans was that plaintiffs' case regarding the alleged toxicity of PCBs could fairly proceed without evidence relating to furans. As a result, Rule 106 did not independently require the admission of additional portions of the text.

toxicity of heat-degraded PCBs they would not have needed to refer in any way to dioxins and furans, and hence that the admission of such evidence would not constitute an end run around the court's previous ruling.

Plaintiffs further assert that the court's allegedly improper evidentiary rulings significantly impaired their ability to fully identify the substances to which they were allegedly exposed, thereby undermining the pursuit of both their medical monitoring and tort recovery.

As we have seen, with regard to their medical monitoring claims, the plaintiffs failed to convince the jury that they were "significantly exposed to PCBs." Plaintiffs assert, however, that because heat-degraded PCBs have far greater carcinogenic potential than unheated PCB mixtures, had they been allowed to proffer the disputed evidence, they could have demonstrated that they were exposed to a kind of PCBs in an amount significant enough to warrant medical monitoring. Plaintiffs also submit that the defendants' experts, who testified that PCBs were not dangerous, relied largely on epidemiological studies of unheated, new PCB mixtures, rather than the heat-degraded PCBs to which plaintiffs allegedly were exposed, which again limited their ability to demonstrate "significant exposure."

Additionally, plaintiffs argue that the court's evidentiary decisions impaired their ability to accurately present their property damage claims. In order to recover for property damage, the plaintiffs had to demonstrate that the remedial activities ordered by the EPA's ROD would not return the property to its former value. Plaintiffs contend that heat-degraded PCBs do not dissipate as rapidly as new PCBs, and, that had they been permitted to offer evidence of heat-degraded PCBs, they could have demonstrated that the remediation ordered by the EPA would be insufficient to neutralize the presence of heat-degraded PCBs at the Yard, and that property damages were in order. As a result, plaintiffs suggest that the court's alleged errors were not harmless and provide a sound basis for reversal.

The defendants respond that heat-degraded PCBs are merely furans by another name, and that therefore the

exclusion of evidence of heat-degraded PCBs was entirely within the ambit of the court's prior ruling regarding furans. Defendants further argue that the admission of such evidence would have posed its own Rule 403 dangers of undue delay and confusion of the issues.

C.

As an initial matter, we are satisfied that the plaintiffs had ample opportunity to convince the jury that they were exposed to PCBs of a more toxic variety than the "background" PCBs that they normally would have encountered in day-to-day life. Plaintiffs presented evidence that they were exposed to Aroclor 1260 PCBs and to weathered Aroclor 1260. According to the plaintiffs' evidence, the harmfulness of a PCB mixture is a function of its persistence: those PCBs that are the most difficult to eliminate from our bodies and environment pose the greatest potential danger. PCB mixtures, the plaintiffs allege, are particularly persistent if they are manufactured with a high degree of chlorination or with a high number of coplanar congeners. Plaintiffs proffered evidence that Aroclor 1260 compounds, even when new, contain the highest chlorine content of any PCB mixture commonly used in this country. The chlorine content of a mixture may also increase as a result of weathering, which is a process of selective retention or preferential bioaccumulation. In addition, coplanar congeners may be formed through incineration. Thus, plaintiffs argue, the chemical to which they were exposed was more toxic than other PCB mixtures.

Not only did the plaintiffs have the opportunity to introduce evidence that they were exposed to PCBs of a more toxic variety than the background PCBs that they normally would have encountered, but we are also satisfied that the evidence they were prevented from introducing would not have substantially altered their case, because they had the opportunity to put forward at trial their essential theory -- that the PCBs to which they were exposed were more toxic than the PCBs in the epidemiological literature. In this vein, Dr. Nisbet testified that the estimates in defendants' tables, which were

proffered as proof that PCBs were not toxic, were based on analysis of PCBs of "a potency factor ... for the unweathered, the pure unweathered aroclors," while the scientific evidence regarding weathered PCBs "would [probably] be more hazardous." Thus, plaintiffs were able to present and reemphasize the theme of their argument -- that what they were exposed to was somehow more dangerous than that to which the background population was exposed. They therefore had little genuine need for the excluded evidence.

At all events, we are persuaded by the defendants' arguments and our independent analysis that the district court acted within its discretion when it excluded plaintiffs' evidence of heat-degraded PCBs. In a ruling affirmed by this Court, the district court had previously excluded evidence of dioxins and furans, and plaintiffs' proffer of evidence of heat-degraded PCBs appears to have been an attempt to evade that ruling by altering the vocabulary. The only proffered basis for admission that plaintiffs offered the court during trial was that the witnesses would not utter the words "dioxin" or "furan." But this justification reads the affirmed prior order, which excluded "[a]ll Testimony, Evidence or Statements to the Jury ... concerning Dioxins, Furans, Tin Tetraphenyl, and Epoxides," too narrowly, for the district court had excluded all evidence that concerns the offending chemicals.

The district court was not without basis for believing that heat-degraded PCBs are functionally dioxins by another name. For example, according to plaintiffs, heat-degraded PCBs have the same toxicity as dioxins. See Appellants' Reply Brief at 5. Additionally, in their deposition testimony, plaintiffs' experts treated heat-degraded PCBs as toxicologically equivalent to dioxins. For instance, Dr. Sherman testified that the literature on coplanar PCBs "likens them to the para dioxins." In addition, the record suggests that heat-degraded PCBs, like dioxins and furans, are waste products formed by the incineration of new PCBs.

Moreover, at oral argument before us, plaintiffs' counsel explained that heat-degraded PCBs are referred to as "dioxin-like" because they react to the same AH receptor that is exploited by dioxin molecules. Discussion of the

toxicity of coplanar PCBs at trial would thus likely have reintroduced the subject of dioxins in a slightly different guise. In sum, it appears to us that the district court did not err in concluding that the plaintiffs' proffer, which was weakly made, was within the ambit of the court's prior ruling, which this Court has affirmed.⁷

D.

Finally, even if the evidence about heat-degraded PCBs was not precluded by the literal terms of the prior ruling, we are persuaded by the defendants' arguments that the district court was within its discretion to make an independent ruling under Rule 403 excluding evidence of heat-degraded PCBs on the ground that its probative value was substantially outweighed by its tendency to cause delay, confusion, and unfair prejudice.⁸ Such a ruling

7. Our ruling does not emanate from any pretense of scientific exactitude, and, unfortunately, the materials presented to this Court fail to illuminate how dioxins and furans differ from heat-degraded PCBs, if in fact they do. Plaintiffs' briefs instead focus on the differences between heat-degraded and unheat-degraded PCBs, and thus offer little guidance as to the scope of the prior ruling. So then, despite the similarities between dioxins and heat-degraded PCBs, subtle structural differences may in fact exist so that it is possible that evidence of heat-degraded PCBs may fall outside the scope of the court's prior ruling regarding dioxins and furans. In fact, one comment made by defense counsel seems to admit of the possibility that heat-degraded PCBs differ materially from dioxins and furans. See Brief for Appellees General Electric Co., Southeastern Pennsylvania Transportation Authority, the City of Philadelphia, and Westinghouse Corp., at 14 ("evidence about coplanar congeners was not precluded by the literal terms of the court's prior rulings"). These possibilities, however, cannot control our evidentiary ruling in view of the weakness of the plaintiffs' showing. Thus, because of the similarities between dioxins and heat-degraded PCBs mentioned above, we remain convinced that the district court did not abuse its discretion in considering evidence of heat-degraded PCBs to be within the ambit of its previous ruling.

8. While we normally require a district court to make explicit its reasoning under Rule 403, this is an unusual situation. The district court did not make an explicit Rule 403 balancing because it believed that the challenged evidence was properly excluded under its affirmed

would find precedent in our initial ruling on the general subject, wherein we adverted to the necessity of mini-trials on the issues presented by the effort to demonstrate exposure to and the impact of heat-degraded PCBs. See Paoli II, 35 F.3d at 781-84.

First, there is little evidence that plaintiffs' exposure to heat-degraded PCBs was significant. There was no offer of proof at trial that heat-degraded PCBs were found at the Yard or in the soil of the nearby residences, or that the temperatures to which PCB fluids were subjected at the Yard were sufficient to create those types of congeners. In fact, a significant amount of soil sampling data failed to indicate that heat-degraded PCBs, as distinct from new PCBs, existed in the soil. In addition, the evidence at trial allowed the conclusion that plaintiffs had not sustained any abnormal exposure to PCBs, regardless of whether that exposure was with respect to heated or unheat-degraded PCBs.⁹

Moreover, the evidence that the plaintiffs allege was impermissibly excluded from trial -- evidence of significant exposure to heat-degraded PCBs -- was never proffered, and apparently was never adequately developed; thus, the

prior order. For purposes of this appeal, we therefore regard the required 403 balancing as implicit in the court's ruling. See Sheridan v. E.I. DuPont de Nemours and Co., 100 F.3d 1061, 1076 n.10 (3d Cir. 1996). In taking this action, we in no way suggest that the district courts are relieved from their obligation to perform this weighing process on the record. Although we are able to perform this balancing test here, other cases may require remand to the court or even a new trial. See Sriyuth, 98 F.3d at 744 n.8 ("We take this occasion, once again, to remind the district courts of their obligation to perform this weighing process on the record.").

9. All but one of the plaintiffs had their blood analyzed for PCB content. Five were found to have no detectable levels of PCBs in their blood. The highest level found among the others was 30 ppb in one plaintiff, a level that the laboratory conducting the analysis considered to be within the normal reference range for PCBs in human blood. In contrast, workers involved in the manufacturing of PCB-containing electrical equipment have been found to have blood levels averaging close to 400 ppb and measuring as high as 3500 ppb. (A2999).

district court never had the opportunity to exclude it. Oral argument on the present appeal was the first time that plaintiffs' counsel recounted how the plaintiffs would have proven that they were exposed to heat-degraded PCBs: they intended to compare chromatograms, which measure the concentration of PCBs, of the soil used at the Yard to a chromatogram of new, unheat-degraded PCBs. They then would have compared the chromatograms of the PCBs at the Yard to the chromatograms of the chemical remnants found in plaintiffs' blood. The nature of the PCB mixture found in a blood sample is determined by the "peaks" in a given chromatogram. If given the opportunity, plaintiffs contend that Dr. Nisbet would have testified that the chromatograms of plaintiffs' blood, which were proffered at trial, recorded peaks attributable to heat-degraded mixtures of Aroclor 1260 PCBs.

While oral argument provided new explanations of the probative value of what plaintiffs intended to show at trial, and the evidence that they claim they would have introduced appears to differ from the evidence actually admitted at trial, we are not at liberty to consider it. Instead, we are limited to a review of the record that was before the district court, and, as previously mentioned, the evidence actually before the district court did not suggest a difference in the type of PCBs measured in the plaintiffs' blood. As such, we find persuasive defendants' contentions that plaintiffs were little prejudiced by the exclusion of evidence pertaining to heat-degraded PCBs and that such evidence was of minor probative value.

Finally, admitting evidence regarding heat-degraded PCBs would appear to require extensive mini-trials on plaintiffs' exposure to these chemicals and the harm they cause. Given the small probative value of the evidence, such a diversion would constitute "undue delay." In sum, under Fed. R. Evid. 403, the district court did not abuse its discretion in excluding the evidence concerning heat-degraded PCBs.

III. THE JURY INSTRUCTIONS

We turn to plaintiffs' challenge to the jury instructions regarding the medical monitoring and property damage

claims. Generally we review a district court's jury instructions for abuse of discretion, although whether the jury instructions misstate a legal standard is a question over which we have plenary review. See United States v. Coyle, 63 F.3d 1239, 1245 (3d Cir. 1995). We review the charge to ensure that "the charge, taken as a whole and viewed in the light of the evidence, fairly and adequately submits the issues in the case to the jury." In re Merritt Logan, Inc., 901 F.2d 349, 359 (3d Cir. 1990) (quoting Ayoub v. Spencer, 550 F.2d 164, 167 (3d Cir. 1977)). In evaluating whether the district court satisfied this requirement, we must examine the charge in its entirety and not limit ourselves to particular phrases in isolation. See Coyle, 63 F.3d at 1245.

A. The Medical Monitoring Claim Instructions

The jury rejected the plaintiffs' medical monitoring claims, and plaintiffs now contend that the district court erred when it instructed the jury that, in order to find for plaintiffs, they must conclude that the plaintiffs had been exposed to a greater level of PCBs as a result of the activities at the Yard than they would encounter normally in their day-to-day lives. In order to evaluate this contention, we must first provide some context. In Paoli I, 916 F.2d at 852, this Court addressed the predicament of persons who are exposed to toxic chemicals but do not suffer from manifest physical injuries. We noted that when these persons suffer instead from latent injuries, common law tort doctrine has often barred recovery because, traditionally, "injury needed to be manifest before it could be compensable," and toxic torts often fail to conform "with the common law conception of injury." Id. at 850. In an effort to accommodate the potential injuries associated with the widespread use of toxic substances, we predicted that the Pennsylvania Supreme Court would recognize medical monitoring claims by plaintiffs who have been exposed to toxic substances but have not suffered manifest physical injuries, and would authorize a plaintiff to recover the "quantifiable costs of periodic medical examinations necessary to detect the onset of physical harm." Id. at 852. We noted that medical monitoring and traditional tort

claims are inherently distinct causes of action, and that, once an injury is manifest and detected, a plaintiff who has pursued a medical monitoring claim may also have a traditional tort action against the same defendant for the injury itself. Id. at 850 n.24.

1.

In Paoli I, we also set forth the elements we understand to be necessary to a successful medical monitoring claim under Pennsylvania law:

1. Plaintiff was significantly exposed to a proven hazardous substance through the negligent actions of the defendants.
2. As a proximate result of exposure, plaintiff suffers a significantly increased risk of contracting a serious latent disease.
3. The increased risk makes periodic examinations reasonably necessary.
4. Monitoring and testing procedures exist which make the early detection and treatment of the disease possible and beneficial.

Id. at 852.

The first hurdle for a plaintiff pursuing of a medical monitoring claim is the need to demonstrate "significant exposure" to a proven hazardous substance. In the case at bar, the jury determined that the plaintiffs had not been significantly exposed to PCBs, and therefore could not satisfy even the first of the four factors necessary to a successful claim. As a result, we need only concern ourselves here with the jury charge as it relates to the definition of "significant exposure."

2.

The district court initially instructed the jury on the "significant exposure" element as follows:

Each plaintiff must prove through competent expert testimony that he or she was significantly exposed to

PCBs from the Paoli Railyard. The plaintiff must prove that PCBs from the Paoli Yard actually entered his or her body in amounts significantly beyond what would enter a person's body in everyday life elsewhere in the Philadelphia area and in amounts sufficient to cause the plaintiff to have a risk of future disease significantly greater than what he or she would have had without exposure.

After plaintiff objected to this formulation, the court further instructed the jury that "the amount of PCBs that anyone would be exposed to in the Philadelphia area, simply means ... greater than [the] normal background area in this region."

The following day, in response to a question for clarification from the deliberating jury regarding the personal injury claims, the court again instructed the jury:

Exposure to PCBs i[s] sufficient if it causes significantly increased risk of contracting a serious latent disease.... I instructed you that [plaintiffs] had to show that amounts were significantly beyond what ordinarily entered a person's body in every day life, elsewhere in the Philadelphia area.

And again, those -- the testimony with respect to the exposure in this area of PCBs to everyone, is just one factor to be considered in determining whether or not they were significantly exposed to PCBs from the Paoli Yard. So you would consider all of those circumstances in considering whether or not they were exposed.

Plaintiffs challenge the instruction that a showing of "significant exposure" required proof that they had been exposed to levels of PCBs greater than the normal background levels. But that part of the court's instruction was taken almost verbatim from Redland Soccer Club v. Department of Navy, 55 F.3d 827 (3d Cir. 1995), where we defined the term "significant exposure" to require that:

a plaintiff ... prove that he was exposed beyond what would normally be encountered by a person in everyday life, so that the plaintiff's risk of being injured from the exposure is greater, in some way, than the risks all of us encounter in our everyday lives. ...

Thus Paoli II requires plaintiffs to show not only that their exposure to toxic substances is greater than normal background levels, but that the increased risk of injury from such exposure warrants medical monitoring against future illness beyond that which is recommended for everyone.

Id. at 846 & n.8 (emphasis added). In other words, medical monitoring claimants must "show[] they were exposed to the toxins at issue at levels significantly above their normal background presence." Id. at 847. The court's instructions fairly and adequately set forth the "significant exposure" element as articulated in Redland Soccer. In fact, we perceive no discernable difference between Redland Soccer and the jury charge issued here in terms of the applicable standard; to that extent, plaintiffs' position appears to be a remonstrance against Redland Soccer, which the district court was constrained to follow (as are we, see Third Circuit Internal Operating Procedures § 9.1).

We also find persuasive the argument set forth by counsel for the defendants that, if anything, the district court's charge suggested that plaintiffs' burden of proof on this element was lighter than that mandated by Redland Soccer. The court responded to the jury's request for clarification by modifying the previous day's charge and stating that whether plaintiffs' exposure was above the background level was "just one factor" in determining significant exposure. However, Redland Soccer makes clear that the existence of above-background-level exposure is not merely "one factor" in determining the significance of the exposure. Instead, proof of abnormal exposure is an absolute prerequisite to a finding of significant exposure.

3.

Faced with the foregoing analysis, plaintiffs invoke a footnote in Paoli II, 35 F.3d at 771 n.36, under which they contend that they could make out a viable medical monitoring claim "even if their exposure was within background levels," so long as the exposure stemmed from defendants' PCBs and "was sufficient to result in their illnesses." The footnote reads:

We note that even if defendants are correct that plaintiffs can only demonstrate exposure at levels within background, this would not necessarily justify the grant of summary judgment for defendants. For example, if everyone in the population had been exposed to substantial amounts of defendants' PCBs such that each individual had high PCB levels, each individual would have PCB levels within the background but this would not justify a verdict for defendants. Normally, plaintiffs could not make out a viable claim if their exposure is within background levels because there would be no reason to believe that their exposure was from the defendants' PCBs as opposed to other PCBs. However, to the extent that the plaintiffs can demonstrate that their exposure stemmed from the defendants' PCBs, they will have presented evidence sufficient to survive summary judgment even if their exposure was within background levels--so long as this exposure was sufficient to result in their illnesses.¹⁰

10. As we have noted above, plaintiffs submit that they were exposed to a more toxic type of PCB -- heat-degraded mixtures -- than they would have ordinarily encountered in their day-to-day existence, and that, even if they were not exposed to a greater quantity of PCBs than they ordinarily would have encountered, they were exposed to a risk of injury significant enough to warrant medical monitoring. Plaintiffs contend that Redland Soccer does not counsel otherwise, for in defining "significant exposure," Redland Soccer did not require the jury to make amount-based comparisons of exposure to contaminants, but only to compare the nature and extent of the risk incurred through exposure. Thus, their argument continues, the court incorrectly required the jury to find that plaintiffs had been exposed to PCBs in an amount greater than that found in the Philadelphia area.

It is not inconceivable that a situation may arise in which the form of a contaminant is so toxic that exposure to it merits medical monitoring, even if the exposed plaintiffs ordinarily encounter similar amounts of a less toxic form of the same contaminant. But such is not the case here, at least under the record, which is poorly developed in this regard. The evidence is unclear as to whether the greater toxicity of the heat-degraded PCBs stems from its persistence in the soil, so that a plaintiff's exposure is simply of longer duration, or if it results in greater bodily impact. Plaintiffs' expert Dr. Nisbet testified that "in the process of

Id.

According to plaintiffs', this footnote allows them to pursue a medical monitoring claim so long as they proffer evidence that they were exposed to sufficient levels of defendants' PCBs to result in their illnesses, a proffer which they claim to have made. Plaintiffs note that they offered expert and lay testimony explaining that their PCB exposure stemmed from the defendants' PCBs. Moreover, they offered proof, to the extent allowed by the district court, that the PCBs to which they were exposed were more dangerous than those PCBs to which the population as a whole was exposed.¹¹ As a result, plaintiffs argue, the district court improperly instructed the jury that, in order to constitute "significant exposure," the plaintiffs must have been exposed to a greater amount of PCBs than the population as a whole.

Plaintiffs' reliance on the Paoli II footnote is misplaced.¹²

weathering the most toxic, the most hazardous components ... are preferentially retained, so that PCB mixtures become more hazardous as they move through the environment." But the testimony is susceptible to two different explanations. Of course, if the increased toxicity results in longer exposure, blood level measures already in the record would take account of it. If it results in greater bodily impact, the record evidence is insufficient to give the jury guidance to support an award based on that theory. In sum, although in another situation plaintiffs may be correct that a pure focus on amount of exposure may be a mistake, plaintiffs' argument falls short on the record.

11. At oral argument, plaintiffs' counsel suggested that it was possible to discern from chromatograms whether the PCBs in the soil and plaintiffs' blood were remnants of heat-degraded PCBs or new PCBs. Yet plaintiffs have never compared the level of heat-degraded PCBs resulting from the Yard to the level of heat-degraded PCBs that they normally encountered, which if greater would have conformed to the court's definition of "significant exposure." As such, the court did not err in charging the jury that they may consider as one factor whether plaintiffs were exposed to a quantitatively different level of PCBs than was the background population.

12. Defendants attempt to reconcile Redland Soccer and Paoli II on the ground that note 36 of Paoli II relates only to the plaintiffs' personal injury claims and not their medical monitoring claims. However, the footnote did not limit itself to plaintiffs' personal injury claims, and the text to which it is appended applies to both personal injury and medical monitoring claims.

In Paoli II, the defendants moved for summary judgment as to both personal injury and medical monitoring claims on the grounds that plaintiffs were unable to demonstrate that they were exposed to PCBs at levels above the background levels to which members of the general population were exposed. In a footnote intended to supply doctrinal context to its prediction of Pennsylvania law, the panel admitted of the possibility that in the limited situation where "everyone in the population had been exposed to substantial amounts of defendants' PCBs," plaintiffs could withstand summary judgment without demonstrating above-background levels of PCBs. Id. (emphasis added). Thus, in the Paoli II footnote, we identified a potential limited exception to the general requirement that plaintiffs demonstrate above-background level exposure, an exception that ensures that the most egregious polluters, those who cause abnormally high degrees of contaminants to permeate an entire geographical area, do not escape medical monitoring liability by virtue of their own extraordinary malfeasance. The plaintiffs, however, offer no proof that the background area in which they live was generally exposed to a high level of defendants' contaminants or that the background PCB level in the Philadelphia area emanated from the Paoli Yard. As a result, they must satisfy the general requirement articulated in Redland Soccer of abnormal exposure to PCBs.

Plaintiffs assert that Redland Soccer applies only where plaintiffs cannot demonstrate direct exposure to the defendants' toxic chemicals, and that in the case at bar, direct evidence of contamination was offered, so that the Paoli II footnote and not Redland Soccer provides the applicable legal standard. However, this characterization of the relationship between Paoli II and Redland Soccer misses the mark. First, as previously iterated, it is the Paoli II footnote, not Redland Soccer, that is limited to a particular context, namely abnormally extensive contamination by a defendant. Second, neither Redland Soccer nor the jurisprudence of medical monitoring claims makes a distinction between cases of direct and indirect exposure. See, e.g., Paoli I, 916 F.2d at 849-52; Paoli II, 35 F.3d at 771-78; Redland Soccer, 55 F.3d at 846-47. Instead, plaintiffs must prove that their exposure to contaminants

exceeded that which they would normally encounter in their daily routines regardless of the nature of the evidence offered in proof.

Redland Soccer recognizes that the medical monitoring cause of action calls for a legal standard different from that of traditional torts because of the special nature of the claim. As we previously noted, medical monitoring claims recognize a need for monitoring because of a significantly increased risk of contracting a disease. 55 F.3d at 846. The risk created by chemical exposure is not "significantly increased" unless it is greater than "the normal risks all of us encounter in our every day lives." Id. Only by requiring a plaintiff to show significant exposure in this way can a court ensure that the plaintiff suffers a need for medical monitoring that is greater than that required by all other persons. Id. If levels of exposure within background levels were enough to create an entitlement to medical monitoring, a toxic tort defendant "would become a health care insurer for medical procedures routinely needed to guard persons against some of the ordinary vicissitudes of life. It would convert toxic torts into a form of specialized health insurance." Id. at 846 n.8.13

13. Plaintiffs also challenge the district court's instruction that they had to prove their exposure was greater than the background level "in the Philadelphia area" or "in this region." But the references to the background level in the pertinent geographic area were entirely proper and necessary to give meaning to the principles set forth in Redland Soccer.

We note in this regard that there was sharply conflicting testimony about the amount of background exposure to PCBs. Dr. Whysner testified for the defense that in the northeastern United States, including Pennsylvania, the background exposure is an amount sufficient to result in an average PCB level of 9.2 ppb in human blood. By contrast, plaintiffs' expert Dr. Nisbet opined that background exposure is an amount that results in a blood level of just 0.1 ppb. However, Dr. Nisbet derived that figure from a study of residents in rural South Carolina. He also acknowledged that background exposures tend to be higher in the northeast, including Pennsylvania, than in the country as a whole.

Against this background, the district court was correct to instruct the jury that what mattered was the background level of exposure in the specific region in which the plaintiffs resided. To instruct otherwise

In sum, the district court acted within the ambit of its discretion when it instructed the jury that, in conformance with Redland Soccer and Paoli II, to be successful in their claim for medical monitoring, plaintiffs must demonstrate that they were exposed to a greater level of PCB exposure than they would ordinarily encounter in their daily life.

B. The Property Damage Instructions

Plaintiffs also contend that the district court improperly instructed the jurors with respect to their "stigma" property damage claims. The district court instructed the jury twice on plaintiffs' property damage claims. The court initially stated:

In order to recover damages for the loss in market value of their properties, each plaintiff must prove by a preponderance of the evidence first that PCBs from the Paoli Railyard caused some actual physical damage to the plaintiff's property. Second, that the plaintiffs prove that repairing that damage will not restore the value of the property to the value it had prior to the damage.

After the court's initial jury charge, the jurors asked whether stigma can be considered damage, "regardless of any physical damage to the property." The court responded in pertinent part:

if you find that there was actual physical damage to the property, even if it was temporary, the plaintiffs

would have rendered meaningless this Court's requirement that plaintiffs prove exposure beyond what would "normally be encountered by a person in everyday life," for the jury would have been allowed to use rural South Carolina or some other non-industrial region as its benchmark for the ordinary life of the residents surrounding the Paoli Railyard. Finally, and at all events, plaintiffs cannot demonstrate prejudice from that instruction because, as noted above, the court later diluted the charge to state that the background level was "just one factor" in determining significant exposure. See, e.g., United States v. Garrett, 574 F.2d 778, 782 (3d Cir. 1978) (other parts of a charge can cure even a constitutionally defective instruction).

would be entitled to recover for stigma damage. But there must first have been actual physical damage to the property in order to recover for stigma damage.

Plaintiffs assert that, because the court repeatedly stated that the damage must be "actual," a term that plaintiffs contend means "permanent," it improperly failed to instruct the jurors that a stigma-based property damage claim may be based on temporary physical damage as authorized by Paoli II.¹⁴

In Paoli II, 35 F.3d at 798, we ruled that an award of stigma damages requires proof of the following elements: "(1) defendants have caused some (temporary) physical damage to plaintiffs' property; (2) plaintiffs demonstrate that repair of this damage will not restore the value of the property to its prior level; and (3) plaintiffs show that there is some ongoing risk to their land."

The plaintiffs argue that the district court erred in instructing the jury to consider whether "actual" property damage occurred under the Paoli II standard. However, as we stated above, what the court instructed the jury was that the plaintiffs need only demonstrate temporary physical damage; the court never instructed the jury that the damage had to be permanent. The court's repeated use of the word "actual" did not convey a different legal standard to the jury. The dictionary defines "actual" as "existing in reality or fact." Webster's New World Dictionary 14 (3d College ed. 1988). Thus, actual damage can be either temporary or permanent. As a result, the jury was not improperly restricted to a finding of permanent damage as a prerequisite to a finding for the plaintiffs. Moreover, the court's use of the word "actual" was appropriate because Paoli II specifically requires proof of some real physical damage to plaintiffs' land, some damage that "exists in fact," as opposed to damage caused by negative publicity alone.

14. Plaintiffs complain that the court employed the term "actual" thirteen times during the course of instructing the jury on the property damage claim. Because we determine that the word "actual" correctly communicates the legal standard at issue, the frequency with which the court employed the term is irrelevant.

Moreover, plaintiffs never objected to the use of the word "actual" at trial, and have therefore waived their right to object. Neely v. Club Med Management Servs., Inc., 63 F.3d 166, 200 (3d Cir. 1995) (objections to jury charge waived if not made before closing argument or the closing of charging); Fed. R. Civ. P. 51. A narrow exception to waiver exists where review is necessary to avoid a gross miscarriage of justice, Neely, 63 F.3d at 200 n.39, or if the error of the district court was plain, United States v. Zehrbach, 47 F.3d 1252, 1260 n.6 (3d Cir.) (en banc), cert. denied, 115 S. Ct. 1699 (1995). Because we conclude that the district court did not err in its instructions, we need not consider here the applicability of the exceptions to waiver, though we observe that making the exceptions applicable here would be quite a "stretch."

Plaintiffs next contend that the district court improperly instructed the jurors to assume that the clean-up activities set forth in the EPA's 1992 ROD will be implemented, see supra n.3. The district court instructed the jurors:

If you find that plaintiffs' property suffered actual physical damage as a result of the presence of PCBs from the Paoli Yard, in order for [a] plaintiff to recover, you must also find that the repair of that damage will not restore the value of the property to the value that it had prior to the damage.

In other words, to be entitled to recover, each plaintiff must prove to you that the clean up activities mandated by the [EPA] will not eliminate the stigma or the loss in value associated with the presence of PCBs on his or her property.

As of the time of oral argument, the clean-up activities ordered by the EPA some four years ago had not been implemented. As a result, plaintiffs contend, the jurors should not have been required to proceed on the basis that all of EPA's remedies would be implemented. At the very least, plaintiffs assign as error the court's failure to give them notice as to the challenged instruction so that they might have offered evidence that the defendants had successfully resisted implementation of EPA's orders. While we are sympathetic to the plaintiffs' position, it does not

provide grounds for reversal, for the district court's instructions were not in error.

In Paoli II, we explained that, to recover for stigma property damages, plaintiffs must prove that "the stigma associated with their land will remain in place after any physical damage to their land has been repaired," regardless of whether the repair is actually completed. 35 F.3d at 798, n.64. Thus, the district court's instruction to the jury to consider whether the plaintiffs' property would remain damaged after the EPA-mandated clean-up activities were completed followed from the nature of the plaintiffs' claims. The plaintiffs could have brought suit under different theories of recovery, such as for temporary loss of use during remediation, but they did not. See Dennis v. Ford Motor Co., 471 F.2d 733, 736-37 (3d Cir. 1973) (recognizing claim for loss of use of commercial vehicle under Pennsylvania law). They were in no way precluded from laying a foundation for such a claim, or offering factual evidence of whether the EPA clean-up will ever be completed. But they did not do so, and it is not for the district court to assume *sua sponte* the responsibility at the close of trial to present plaintiffs' best approach to an issue to the jury.

Finally, plaintiffs note that three of the nine property damage claimants sold their properties at a loss, and contend therefore they could not benefit from the remedial activities mandated by the EPA, even if such activities are completed.¹⁵ As explained above, whether repairs are actually completed, and, whether they are completed prior to the sale of the properties in question, is legally irrelevant to the success of the claim that was tried -- one for stigma property damage. Plaintiffs were not precluded from presenting evidence that they suffered an interim loss in property value prior to the remediation. Instead, they tried to persuade the jury that they suffered permanent property damage, and the jury was not swayed. Thus, plaintiffs' claim of error in the property damage instructions must fail.

15. Plaintiffs' expert Ludwig testified that the three plaintiffs who had sold their properties prior to trial lost \$63,000, \$55,000, and \$15,000 respectively.

IV. CONCLUSION

It is not without a backward glance that we finally lay this case to rest. Countless hours and immeasurable efforts have been dedicated to guaranteeing the plaintiffs proper pretrial proceedings and their fair day in court. Yet after two weeks of trial, the jury remained unconvinced of the most basic of plaintiffs' claims. While some may have found the verdict surprising, our analysis of the district court's proceedings has assured us that the verdict was not the result of reversible trial error. The judgment of the district court will therefore be affirmed.

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Teste:

Clerk of the United States Court of Appeals
for the Third Circuit