

September 3, 2010

Elisabeth A. Shumaker
Clerk of Court

PUBLISH

**UNITED STATES COURT OF APPEALS
TENTH CIRCUIT**

MERILYN COOK; WILLIAM
SCHIERKOLK, JR.; DELORES
SCHIERKOLK; RICHARD BARTLETT;
LORREN BABB; GERTRUDE BABB;
MICHAEL DEAN RICE; BANK
WESTERN; THOMAS L. DEIMER;
RHONDA J. DEIMER; STEPHEN
SANDOVAL; PEGGY J. SANDOVAL;
SALLY BARTLETT,

Plaintiffs-Appellees –
Cross-Appellants,

v.

Nos. 08-1224, 08-1226
and 08-1239

ROCKWELL INTERNATIONAL
CORPORATION and DOW CHEMICAL
COMPANY,

Defendants-Appellants –
Cross-Appellees,

AMERICAN NUCLEAR INSURERS;
NUCLEAR ENERGY INSTITUTE, INC.,

Amici Curiae.

**APPEAL FROM THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLORADO
(D.C. NO. 1:90-CV-00181-JLK)**

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Ellen C. Ginsberg, Esq, Michael A. Bauser, Esq., Anne W. Cottingham, Esq., and Jerry Bonanno, Esq., Nuclear Energy Institute, Inc.; Donald E. Jose, Esq., Jose & Associates, Malvern, PA; and Charles F. Rysavy, Esq., K&L Gates LLP, Newark, NJ, on the brief for Nuclear Energy Institute, Inc., Amicus Curiae.

Before **MURPHY, ANDERSON, and HOLMES**, Circuit Judges.

MURPHY, Circuit Judge.

I. INTRODUCTION

The owners of property near the former Rocky Flats Nuclear Weapons Plant (“Rocky Flats”) filed a class action against the facility’s operators under the Price-Anderson Act (“PAA”), alleging trespass and nuisance claims arising from the release of plutonium particles onto their properties. The district court conducted a lengthy trial, resulting in a jury verdict in favor of the plaintiff class.

After a series of post-trial motions, the district court entered judgment in favor of Plaintiffs, awarding a total of just over \$926 million, inclusive of compensatory damages, punitive damages, and prejudgment interest. Defendants, Dow Chemical Company (“Dow”) and Rockwell International Corporation (“Rockwell”), timely appealed the judgment, and the class members filed a timely cross-appeal.

Exercising appellate jurisdiction pursuant to 28 U.S.C. § 1291, this court **REVERSES** and **REMANDS** the case to the district court. We **DIRECT** the district court to vacate the judgment and conduct further proceedings not inconsistent with this opinion.

II. BACKGROUND

Rocky Flats, located near Denver, Colorado, was established by the United States Government in the 1950s to produce nuclear weapon components. The government contracted with Dow to operate the facility from 1952 to 1975, and then with Rockwell from 1975 to 1989. Operations at Rocky Flats ceased in June 1989 after the Federal Bureau of Investigation and the Environmental Protection Agency searched the facility. Rockwell was subsequently charged with, and ultimately pleaded guilty to, certain environmental crimes at the site. The facility has since undergone remediation efforts and is now designated as a wildlife refuge.

Property owners, whose properties lie within a thirty square mile area east of Rocky Flats, filed this class action on January 30, 1990, alleging a public liability action under the PAA involving trespass and nuisance claims against Dow and Rockwell. A public liability action is an action asserting legal liability arising from a nuclear incident.¹ Plaintiffs' most recent amended complaint alleged the release of plutonium at Rocky Flats resulted in the contamination of the class members' properties. Plaintiffs sought compensatory damages, measured by the diminution of property values, as well as punitive damages.

In October 1993, the district court certified a class consisting of “[a]ll persons and entities owning an interest (including mortgagee and other security interests) in real property situated within the Property Class Area, exclusive of governmental entities, defendants, and defendants’ affiliates, parents, and subsidiaries” as of June 7, 1989. In May 2005, the district court split the certified class into two subclasses:

The first sub-class shall consist of all Class members who owned property within the Class Area on the later of: (i) January 30, 1990, the date this action was filed; or (ii) the date on which the jury, per Restatement [(Second) of Torts] § 930(1), finds it appeared the trespass and/or nuisance asserted by Plaintiffs would continue

¹Though the PAA provides a federal cause of action, Congress has not eliminated considerations of state law in the PAA context. The PAA provides: “A public liability action shall be deemed to be an action arising under section 2210 of this title, and the substantive rules for decision in such action shall be derived from the law of the State in which the nuclear incident involved occurs, unless such law is inconsistent with the provisions of such section.” 42 U.S.C. § 2014(hh).

indefinitely. . . . The second sub-class consists of all other Class members.

The district court generally referred to the first subclass as the “Prospective Damages Subclass” and the second as the “Non-Prospective Damages Subclass.”

After over fifteen years of litigation, the district court conducted a four-month jury trial between October 2005 and January 2006. In accordance with the district court’s construction of Colorado law,² the jury instructions did not require Plaintiffs to establish either an actual injury to their properties or a loss of use of their properties. With respect to the nuisance claims, the district court instructed the jury that Plaintiffs could establish Defendants’ conduct interfered with the use and enjoyment of the class properties by proving Defendants’ conduct exposed Plaintiffs to “some increased risk of health problems” or caused conditions “that pose a demonstrable risk of future harm to the Class Area.” As to Plaintiffs’ trespass claims, the district court instructed the jury, “Plaintiffs are *not* required to show that plutonium is present on the Class Properties at any particular level or concentration, that they suffered any bodily harm because of the plutonium or that the presence of plutonium on the Class Properties damaged these properties in some other way.”

Plaintiffs’ evidence regarding the effects of plutonium on their properties consisted of expert testimony indicating any plutonium exposure, no matter how

²*See supra* n.1.

small, increases the risk of cancer. Plaintiffs' experts did not testify, however, regarding the level of risk of developing cancer from exposure to plutonium released at Rocky Flats. Rather, they suggested any increased risk was small and unquantifiable.

The jury deliberated for three weeks and ultimately returned a verdict in favor of the plaintiff class on each of the trespass and nuisance claims. The jury awarded \$176,850,340.00 in compensatory damages on the trespass claims and awarded the same amount on the nuisance claims, based on the diminution of the value of the properties. The jury also awarded punitive damages totaling \$110,800,000.00 against Dow and \$89,400,000.00 against Rockwell.

After a long series of post-trial motions, the district court entered a final judgment against Defendants on June 2, 2008, pursuant to Federal Rule of Civil Procedure 54(b). Including prejudgment interest, the court ordered compensatory damages against Dow in the amount of \$653,313,678.05 and against Rockwell in the amount of \$508,132,861.39. The judgment further stated, however, the total compensatory damages recovered by the plaintiff class shall not exceed \$725,904,087.00. Punitive damages were ordered in the same amounts the jury awarded. Thus, the judgment awarded a total of just over \$926 million to the plaintiff class, including prejudgment interest. The district court's judgment,

however, did not allocate damages to individual class members.³ Rather, the district court attached a Plan of Allocation to the judgment, which provides for the appointment of a claims administrator to make recommendations as to how the lump sum identified in the judgment should be distributed. The Plan of Allocation also provides a framework for calculating each class member's share and distributing any unclaimed funds. Dow and Rockwell timely appealed the district court's judgment and the class members filed a timely cross-appeal.

III. DISCUSSION

A. Jurisdiction

Before addressing the merits of an appeal, this court's first obligation is to assure itself of jurisdiction to do so. *Image Software, Inc. v. Reynolds & Reynolds Co.*, 459 F.3d 1044, 1048 (10th Cir. 2006). This appeal involves two jurisdictional issues: whether the district court properly exercised subject matter jurisdiction over this action and whether the district court entered an appealable final judgment.

³The parties indicated a desire to appeal prior to determining how damages should be distributed to individual class members. Plaintiffs sought a final appealable judgment under Federal Rule of Civil Procedure 54(b), while Defendants sought an interlocutory appeal as to certain orders only, pursuant to 28 U.S.C. § 1292. The district court opted to enter a final judgment under Rule 54(b). In doing so, it determined the total amount of compensatory and punitive damages, as well as the amount of prejudgment interest due from each Defendant. Execution of the judgment was stayed to permit Defendants to appeal. The judgment also includes the district court's Rule 54(b) certification that "there is no just reason for delay[ing]" entry of judgment.

1. Subject Matter Jurisdiction

This court sua sponte raised the issue of whether the district court properly exercised subject matter jurisdiction over this action.⁴ The court's concern arose from the language of 42 U.S.C. § 2210(n)(2), which provides: "With respect to any public liability action arising out of or resulting from a nuclear incident, the United States district court in the district where the nuclear incident takes place . . . shall have original jurisdiction without regard to the citizenship of any party or the amount in controversy." At first glance, the statute appears to require proof of a "nuclear incident"⁵ to permit federal subject matter jurisdiction over a PAA action. Even assuming it imposes a jurisdictional requirement, however,

⁴This court ordered the parties to submit supplemental briefing directed to the question of whether 42 U.S.C. § 2210(n)(2) imposes the jurisdictional requirement of establishing a "nuclear incident." See Fed. R. Civ. P. 12(h)(3) ("If the court determines at any time that it lacks subject-matter jurisdiction, the court must dismiss the action."); *Estate of Harshman v. Jackson Hole Mountain Resort Corp.*, 379 F.3d 1161, 1164 (10th Cir. 2004) ("Because lack of federal jurisdiction cannot be waived or be overcome by an agreement of the parties, we must satisfy ourselves not only of our own jurisdiction, but also that of the lower courts in the cause under review." (quotations omitted)); *Citizens Concerned for Separation of Church & State v. City & County of Denver*, 628 F.2d 1289, 1301 (10th Cir. 1980) ("A federal court must in every case, and at every stage of the proceeding, satisfy itself as to its own jurisdiction, and the court is not bound by the acts or pleadings of the parties."). Supplemental briefing was also ordered on the state of the record and whether remand is necessary, assuming § 2210(n)(2) imposes a jurisdictional requirement.

⁵"Nuclear incident" is defined as "any occurrence . . . causing . . . bodily injury, sickness, disease, or death, or loss of or damage to property, or loss of use of property, arising out of or resulting from the radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or byproduct material." 42 U.S.C. § 2014(q).

closer inspection indicates 42 U.S.C. § 2210(n)(2) is not the sole source of federal jurisdiction over a PAA action.

Although the complete history of the PAA need not be repeated, a brief overview of its evolution, which this court described more fully in *Kerr-McGee Corp. v. Farley*, 115 F.3d 1498, 1503-04 (10th Cir. 1997), is helpful. *See also In re TMI Litig.*, 193 F.3d 613, 624 n.7 (3d Cir. 1999), *amended by* 199 F.3d 158 (3d Cir. 2000); *O'Connor v. Commonwealth Edison Co.*, 13 F.3d 1090, 1095-97 (7th Cir. 1994). In 1954, Congress enacted the Atomic Energy Act (“AEA”) “to facilitate a transition from a federal government monopoly over the production and use of atomic materials to a regime in which private industry also would have a role in their production and use.” *Kerr-McGee Corp.*, 115 F.3d at 1503. To further encourage private development in the nuclear energy field, Congress amended the AEA in 1957 by enacting the PAA, which “creat[ed] specific protections from tort liability for the nuclear industry.” *Id.* At that time, however, Congress opted not to create a federal cause of action for nuclear torts, but instead permitted tort recovery under traditional state causes of action. *Id.* Accordingly, unless the diversity statute applied or the action resulted from an “extraordinary nuclear occurrence,”⁶ nuclear-related tort claims typically could

⁶“Extraordinary nuclear occurrence” is defined as: any event causing a discharge or dispersal of source, special nuclear, or byproduct material from its intended place of confinement in amounts offsite, or causing radiation levels offsite, which the

(continued...)

not proceed in federal court. *See In re TMI Litig. Cases Consol. II*, 940 F.2d 832, 853 n.18 (3d Cir. 1991).

The PAA was amended several times in subsequent years, most notably in 1988 when Congress created a federal cause of action for nuclear torts, thereby expanding federal jurisdiction over such claims. *Kerr-McGee Corp.*, 115 F.3d at 1503. 42 U.S.C. § 2210(n)(2) now provides:

With respect to any public liability action arising out of or resulting from a nuclear incident, the United States district court in the district where the nuclear incident takes place . . . shall have original jurisdiction without regard to the citizenship of any party or the amount in controversy. Upon motion of the defendant or of the [Nuclear Regulatory] Commission or the Secretary [of Energy], as appropriate, any such action pending in any State court (including any such action pending on August 20, 1988) or United States district court shall be removed or transferred to the United States district court having venue under this subsection.

Accordingly, the 1988 Amendments made it clear that any action asserting public liability can be originally filed in or removed to the appropriate federal district court. In doing so, Congress also designated the particular venue in which any such action must be tried if it is to proceed in federal court; i.e., “the United States district court in the district where the nuclear incident takes place.” These

⁶(...continued)

Nuclear Regulatory Commission or the Secretary of Energy, as appropriate, determines to be substantial, and which the Nuclear Regulatory Commission or the Secretary of Energy, as appropriate, determines has resulted or will probably result in substantial damages to persons offsite or property offsite.

42 U.S.C. § 2014(j).

Amendments, however, did not create exclusive federal jurisdiction over PAA actions. *Kerr-McGee*, 115 F.3d at 1504-05. Indeed, the express language of 42 U.S.C. § 2210(n)(2) makes it clear state courts are free to resolve PAA actions unless a defendant, the Nuclear Regulatory Commission, or the Secretary of Energy opts to remove the action to federal court.

As indicated, this court was concerned that 42 U.S.C. § 2210(n)(2) could be read as limiting federal jurisdiction to public liability actions “arising out of or resulting from a nuclear incident,” thus requiring proof of a nuclear incident as a jurisdictional element. We see no indication, however, that Congress intended 42 U.S.C. § 2210(n)(2) to be the sole source of federal jurisdiction over PAA actions. Rather, Congress expanded federal jurisdiction to ensure that actions involving a “nuclear incident” can proceed from their inception in federal court, even if the parties cannot otherwise establish the requirements of 28 U.S.C. § 1332. Congress did not, however, eliminate a party’s right to proceed in federal court when other jurisdictional bases exist. Accordingly, a plaintiff need not establish a “nuclear incident” under 42 U.S.C. § 2210(n)(2) in order to proceed in federal court with a PAA action when another basis for federal jurisdiction is present.⁷

⁷Because any jurisdictional requirements in 42 U.S.C. § 2210(n)(2) only apply to federal courts, a remarkable anomaly would arise if § 2210(n)(2) was the sole source of federal jurisdiction, demanding proof of a nuclear incident as a jurisdictional prerequisite. If a plaintiff was unable to establish a nuclear incident, the federal district court would be compelled to dismiss for lack of subject matter jurisdiction. The jurisdictional dismissal would not, however, (continued...)

Indeed, jurisdictional grounds will always exist for a plaintiff's properly pleaded PAA claim. As we previously explained, Congress's 1988 Amendments created a new federal cause of action, known as a "public liability action." 42 U.S.C. § 2014(hh) provides:

The term 'public liability action,' as used in section 2210 of this title, means any suit asserting public liability. A public liability action shall be deemed to be an action arising under section 2210 of this title, and the substantive rules for decision in such action shall be derived from the law of the State in which the nuclear incident involved occurs, unless such law is inconsistent with the provisions of such section.

As a result, any suit "asserting public liability" under 42 U.S.C. § 2210 is a civil action arising under the laws of the United States over which a federal court has subject matter jurisdiction pursuant to 28 U.S.C. § 1331.

Accordingly, we need not decide whether the district court had subject matter jurisdiction under 42 U.S.C. § 2210(n)(2), because the district court clearly had subject matter jurisdiction under 28 U.S.C. §§ 1331.⁸

⁷(...continued)
necessarily prevent a plaintiff from proceeding with their PAA action in state court, where any jurisdictional language in § 2210(n)(2) would be inapplicable and proof of a nuclear incident would have no jurisdictional relevance. The strange result would be that no federal court could exercise subject matter jurisdiction; only state courts could reach the merits of the plaintiff's federal cause of action under the PAA. Such a result would make no sense given Congress's intent to permit plaintiffs to pursue public liability actions in federal court. *C.f. infra* Section III(B) (holding a plaintiff must nonetheless always establish a nuclear incident as a threshold element of a PAA claim).

⁸Plaintiffs' complaint alleged subject matter jurisdiction under the PAA, 42 (continued...)

2. Finality of the Judgment

Having concluded the district court's exercise of subject matter jurisdiction was proper, we now turn to Defendants' motion to dismiss this appeal for lack of subject matter jurisdiction. Specifically, Defendants argue the district court's judgment is not sufficiently final to warrant certification under Federal Rule of Civil Procedure 54(b). Rule 54(b) allows the district court to "direct entry of a final judgment as to one or more, but fewer than all, claims or parties" so long as "the district court expressly determines that there is no just reason for delay." The general rule, however, is that an order which "determines liability but leaves damages to be calculated is not final." *Harbert v. Healthcare Servs. Group, Inc.*, 391 F.3d 1140, 1145 (10th Cir. 2004). Nonetheless, in *Strey v. Hunt International Resources Corp.*, this court explained that when damages are not allocated to specific class members, the resolution of class liability claims may warrant Rule 54(b) certification if "the district court establishes both the formula that will determine the division of damages among class members and the principles that will guide the disposition of any unclaimed funds." 696 F.2d 87, 88 (10th Cir. 1982).

⁸(...continued)

U.S.C. § 2210(n)(2), the federal question statute, 28 U.S.C. § 1331, and the diversity jurisdiction statute, 28 U.S.C. § 1332. Plaintiffs' complaint also alleged jurisdiction under the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9613(b). Plaintiffs make no argument on appeal that CERCLA is the source of federal jurisdiction, and they only presented their PAA trespass and nuisance claims to the jury.

Here, the district court purported to enter judgment under Rule 54(b), stating the total damages against each Defendant and determining there is no just reason for delaying entry of judgment. The judgment did not, however, distribute the aggregate class award among individual members. Instead the district court attached a Plan of Allocation to the judgment, which provides a thorough framework for determining each individual class member's damages. Having thoroughly reviewed the Plan of Allocation, we conclude it complies with the requirements of *Strey*.

The Plan of Allocation provides for the appointment of a claims administrator, who is directed to determine the proper allocation of damages based on specific data. The claims administrator must determine ownership of each class property as of the relevant dates as well as each property's assessed value based on county property and tax records. This value is to be expressed as a fraction of the total value of all properties within the same category, specifically residential, commercial, or vacant property. The class administrator is directed to use this fraction to determine the total damages to be allocated to each property and make recommendations to the district court based on this calculation. The Plan of Allocation also provides for the distribution of any unclaimed funds.

The Plan of Allocation simply requires the application of mathematical principles to a formula involving identifiable property records and the jury's verdict. In doing so, the Plan of Allocation directs the method of allocating

damages among the individual class members, while also explaining how unclaimed funds shall be distributed. Contrary to Defendants' argument, the Plan of Allocation does not require resolution of complex issues or calculations. While it is true that certain class members may wish to challenge the ultimate allocation of damages to them, the guidelines provided by the Plan of Allocation are straightforward and mechanical. Moreover, any such challenges would not affect the total damages owed by Defendants, which are clearly identified in the judgment. Consequently, this court concludes the Plan of Allocation's basic formula for determining individual damages sufficiently complies with *Strey* and the Rule 54(b) judgment entered by the district court is final. Defendants' motion to dismiss for lack of appellate jurisdiction is therefore denied.

B. Threshold Elements of a PAA Claim

Turning to the merits of the appeal, Defendants argue the district court erred by refusing to instruct the jury that in order for Plaintiffs to prevail on their PAA claims, they must establish a "nuclear incident" occurred by showing "loss of or damage to property, or loss of use of property." As an initial matter, we note that an issue was raised at oral argument as to whether or not Defendants forfeited this argument. It is arguable Defendants failed to preserve the issue of whether a "nuclear incident" must be established as a threshold element of a plaintiff's PAA claim. Nonetheless, Plaintiffs themselves failed to adequately present any such forfeiture argument in their appellate brief. At oral argument, Plaintiffs admitted

they did not expressly raise a forfeiture argument, but instead asserted that their brief sufficiently presented the argument by generic references to Defendants’ “novel Price-Anderson argument” and Defendants’ failure to “identify with clarity the specific rulings of which [they] seek review, or the locations in the record where [their] points were raised.” We disagree. Plaintiffs’ brief only makes reference to Defendants’ lack of citations to rulings below in explaining the difficulty they had in responding to certain arguments. The brief does not raise a forfeiture challenge. Accordingly, Plaintiffs have themselves forfeited any forfeiture argument they may have on this issue, and this court will consider the merits of Defendants’ argument. *See United States v. Heckenliable*, 446 F.3d 1048, 1049 n.3 (10th Cir. 2006) (explaining the government “waived the waiver” by failing to argue defendant forfeited his challenge on appeal); *see also Soo Line R. Co. v. St. Louis Sw. Ry. Co.*, 125 F.3d 481, 483 n.2 (7th Cir. 1997) (holding plaintiff “waived any waiver defense it might have had” by failing to argue defendant forfeited its appellate argument due to a judicial admission).

This court “review[s] de novo whether, as a whole, the district court’s jury instructions correctly stated the governing law and provided the jury with an ample understanding of the issues and applicable standards.” *Martinez v. Caterpillar, Inc.*, 572 F.3d 1129, 1132 (10th Cir. 2009) (quotation omitted). As we previously mentioned, the 1988 Amendments to the PAA created a federal cause of action known as a “public liability action.” A “public liability action . . .

means any suit asserting public liability.” 42 U.S.C. § 2014(hh). In turn, “public liability” is defined as “any legal liability arising out of or resulting from a nuclear incident.” 42 U.S.C. § 2014(w).

In keeping with these definitions, Defendants argue Plaintiffs must establish that any liability does in fact arise out of or result from a nuclear incident. A “nuclear incident” is defined as “any occurrence . . . causing . . . bodily injury, sickness, disease, or death, or loss of or damage to property, or loss of use of property, arising out of or resulting from the radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or byproduct material.” 42 U.S.C. § 2014(q). Consequently, Defendants argue Plaintiffs must prove as a threshold element of their PAA claims that they suffered one of the injuries enumerated in 42 U.S.C. § 2014(q).

This court analyzed a similar question in *June v. Union Carbide Corp.*, 577 F.3d 1234 (10th Cir. 2009). There, defendants’ uranium mining and milling operations exposed nearby residents to radiation to such an extent that the community had to be evacuated and all structures were razed as part of the remediation effort. *Id.* at 1236-37. One-hundred-fifty-two plaintiffs claimed the mining and milling operations increased their risk of developing radiation-related illnesses and pursued medical monitoring claims to help detect the onset of disease. *Id.* at 1237. This court affirmed the dismissal of the medical monitoring

claims because they did not implicate “bodily injury,” which was the only potentially applicable injury under § 2014(q). *Id.* at 1248-52.

Though *June* did not expressly determine the circumstances in which a plaintiff must establish injury,⁹ we now confirm that the occurrence of a nuclear incident, and thus a sufficient injury under § 2014(q), constitutes a threshold element of any PAA claim. Consequently, we reject Plaintiffs’ suggestion that they need only *assert* liability arising out of a nuclear incident. The presence of a nuclear incident is the hallmark of a public liability action. Were a plaintiff only required to plead the presence of a nuclear incident, but never establish one, a “public liability action” would be completely indistinguishable from whichever state tort claim a particular PAA action incorporates. In creating a federal cause of action under the PAA, however, Congress made clear its intention to limit recovery to the discrete group of injuries enumerated in § 2014(q) while

⁹In *June*, the district court dismissed the medical monitoring claims without prejudice for lack of subject matter jurisdiction under 42 U.S.C. § 2210(n)(2). *See June v. Union Carbide Corp.*, 577 F.3d 1234, 1248 (10th Cir. 2009). On appeal, defendants argued dismissal should have been with prejudice because “bodily injury” is an element of a PAA claim rather than a jurisdictional requirement. *Id.* at 1248 n.8. This court, however, did not resolve whether “bodily injury” is a jurisdictional requirement because defendants had not cross-appealed with respect to that issue. *Id.* Additionally, this court noted the standard of appellate review is the same regardless of whether “bodily injury” is treated as a jurisdictional requirement or an element of a plaintiff’s PAA claim. *Id.*

simultaneously utilizing state law to frame the “substantive rules for decision.”¹⁰ 42 U.S.C. § 2210(hh). Plaintiffs provide no reason why we should render the statute’s nuclear incident requirement superfluous outside of the pleading stage. *See* 42 U.S.C. § 2014(w). Accordingly, we conclude a plaintiff must establish an injury sufficient to constitute a nuclear incident as a threshold, substantive element of any PAA claim.

The only injuries listed in § 2014(q) which can establish a nuclear incident in the case at hand are “loss of or damage to property” and “loss of use of property.”¹¹ This court has never defined these terms either individually or in a manner that would differentiate one from the other. Our recent decision in *June*, however, provides significant guidance. As we previously noted, the plaintiffs in *June* claimed the defendants’ uranium operations increased their risk of developing health problems and thus pursued medical monitoring claims. 577 F.3d at 1237. The district court determined medical monitoring claims do not involve a “bodily injury” and dismissed the action. *Id.* at 1248. This court

¹⁰Indeed, 42 U.S.C. § 2014(hh) provides that state law provides the substantive rules for decision, “unless such law is inconsistent with the provisions of [42 U.S.C. § 2210].” A “public liability action” arising under § 2210, however, incorporates definitions provided by § 2014, including § 2014(q) which defines “nuclear incident.”

¹¹Plaintiffs have never argued their claims involve “bodily injury.” Indeed, their decision to pursue classic property tort claims, trespass and nuisance, makes it clear they seek recovery for injuries to a property interest rather than “bodily injury.”

affirmed and held “DNA damage and cell death” do not constitute a bodily injury in the absence of the manifestation of an actual disease or injury, despite the increased risk of developing disease in the future. *Id.* at 1248-49. In short, *June* makes clear that only an existing physical injury constitutes “bodily injury” under the PAA; the mere subclinical effects of radiation exposure are insufficient. *Id.* at 1249.

Our characterization of “damage to property” is informed by the analysis in *June*, as the logic applies equally to the issue before us in this appeal. Just as an existing physical injury to one’s body is necessary to establish “bodily injury,” so too is an existing physical injury to property necessary to establish “damage to property.” Without a demonstrable manifestation of injury, the presence of plutonium can, at best, only establish a risk of future damage to property. As this court indicated in *June*, however, mere risk of future damage is insufficient. *Id.* at 1249. Rather, the physical damage must actually be manifest at the time the PAA claim is asserted. This requirement does not heighten a plaintiff’s burden of proof, but simply provides that a plaintiff wishing to sue under the PAA for a nuclear-related property injury involving “damage to property” must first establish actual damage to the property in question.

Here, Plaintiffs argue the mere presence of radioactive plutonium particles on their property establishes the requisite damage. In their supplemental brief, Plaintiffs point out a “nuclear incident” is defined as any enumerated injury

“arising out of or resulting from the radioactive, toxic, explosive, or other hazardous properties of . . . special nuclear . . . material.” 42 U.S.C. § 2014(q). Without question, “special nuclear material” includes plutonium. 42 U.S.C. § 2014(aa). According to Plaintiffs, this compels the conclusion that plutonium contamination itself is enough to establish “damage to property.” This argument misses the point. The statute does not indicate that the mere presence of plutonium is per se injurious to property. If mere contamination without actual damage were enough, Congress could have easily listed “contamination” as an injury falling within 42 U.S.C. § 2014(q)’s definition of “nuclear incident.” Instead, Congress required a showing of “damage to property.”

In order to prove plutonium-related “damage to property,” Plaintiffs must necessarily establish that plutonium particles released from Rocky Flats caused a detectable level of actual damage to the class properties.¹² Jury Instruction No. 3.3

¹²In their supplemental brief, Plaintiffs also suggest that diminution of their property values establishes “damage to property” or “loss of use of property.” Diminution of value, however, cannot establish the fact of injury or damage. Otherwise, reduced value stemming from factors unrelated to any actual property injury, such as unfounded public fear regarding the effects of minor radiation exposure, could establish “damage to property” and “loss of use of property.” Public perception and the stigma it may attach to the property in question can drastically affect property values, regardless of the presence or absence of any actual injury or health risk. Instead, courts have traditionally utilized diminution of value as a measurement of damages rather than proof of the fact of damage. *See, e.g.*, Restatement (Second) of Torts § 929(1)(a); *Smith v. Kan. Gas Serv. Co.*, 169 P.3d 1052, 1061-62 (Kan. 2007) (collecting cases in the nuisance context). Plaintiffs have cited no cases from any jurisdiction suggesting a different approach should apply here. We conclude the PAA requires a showing of actual
(continued...)

confirmed that Plaintiffs must prove the presence of plutonium on class properties to prevail on their trespass claim. The language of Instruction No. 3.3, however, underscored the limited nature of that proof: “Plaintiffs are *not* required to show that plutonium is present on the Class Properties at any particular level or concentration, that they suffered any bodily harm because of the plutonium or that the presence of plutonium on the Class Properties damaged these properties in some other way.” Accordingly, Plaintiffs were never required to, and did not, present evidence of actual physical damage to the property.

“Damage to property” is not, however, the only property injury that a plaintiff can prove to establish the PAA threshold element of a nuclear incident; a plaintiff who establishes a “loss of use of property” may also recover under the PAA. The express statutory language indicates that more than a mere interference with an owner’s use is necessary; a particular use of the property must actually be lost.

Plaintiffs did present evidence relevant to a loss of use. Specifically, they tried their nuisance claims under the theory that the presence of plutonium particles on their properties places them at an increased risk of health problems. We agree that when the presence of radioactive materials creates a sufficiently high risk to health, a loss of use may in fact occur. For instance, a residential or

¹²(...continued)
physical injury to the properties themselves rather than a mere decline in the properties’ value.

business use may be lost due to an increased risk to health so high that no reasonable person would freely choose to live on or work at the property. Similarly, agricultural use may be lost where the soil can no longer produce crops that are safe for consumption due to the presence of the radioactive substance. In short, where the evidence indicates the property has been affected by the radioactive material to such an extent that an otherwise appropriate use of the property is lost, a plaintiff has established the threshold injury element of his PAA claim.¹³

Here, Plaintiffs were never required to establish a “loss of use of property.” Instead, Jury Instruction No. 3.6 only required the jury to find that Defendants “interfered with Class members’ use and enjoyment of their properties” in one of two ways: (1) “[b]y causing Class members to be exposed to plutonium and placing them at some increased risk of health problems” or (2) “[b]y causing objective conditions that pose a demonstrable risk of future harm to the Class Area.” Plaintiffs’ experts merely testified that *any* exposure to plutonium whatsoever increases the risk of health problems to some degree. Without an accompanying estimate or calculation of the increased risk, however, this evidence is insufficient to establish a loss of use under 42 U.S.C. § 2014(q). Plaintiffs must

¹³We note the instant case does not require, and the examples provided do not necessarily represent, development of a complete list of circumstances in which a plaintiff can establish a “loss of use.”

instead prove that the particular level of risk created by Defendants' conduct had the effect of actually depriving them of a specific use.

During supplemental briefing, this court directed Plaintiffs to identify any evidence presented at trial that could establish a loss of use of property.¹⁴ Plaintiffs' supplemental brief confirms they attempted to make out their PAA claims solely by establishing an increased health risk. Plaintiffs' submissions, however, do not reveal evidence of an increased health risk that would be sufficient to permit a reasonable fact-finder to find a loss of use. Indeed, Plaintiffs' experts testified only that the actual dosage of radiation to which Plaintiffs have been exposed creates a small and unquantifiable increased risk of health problems. Nonetheless, we need not review the sufficiency of the evidence, as the jury was never properly instructed on the threshold elements of Plaintiffs' PAA claims. On remand, Plaintiffs will be tasked with producing additional evidence that could support a jury's finding that a nuclear incident occurred, in the form of "loss of or damage to property, or loss of use of property" under 42 U.S.C. § 2014(q).

Because the jury was not properly instructed on an essential element of Plaintiffs' PAA claims, the verdict must be set aside and the case remanded for further proceedings not inconsistent with this opinion.

¹⁴Though the purpose of this inquiry pertained to the related jurisdictional issue, *see supra* n.4, the ultimate question of whether Plaintiffs suffered a loss of use is the same.

C. Federal Preemption

Defendants also challenge the district court's ruling that federal nuclear safety standards do not preempt state tort standards of care under the PAA.¹⁵ Essentially, Defendants argue they are exempt from liability if their conduct complied with federal nuclear safety standards, even if they could be held liable under a more restrictive state tort standard of care. Whether federal law preempts state tort law is a question of law which this court reviews de novo. *Dobbs v. Anthem Blue Cross & Blue Shield*, 475 F.3d 1176, 1177 (10th Cir. 2007).

Plaintiffs argue the language of § 2014(hh) makes it clear state tort standards of care apply to a PAA action. Defendants argue, on the other hand, that because state tort standards of care conflict with the PAA scheme, they are preempted by federal nuclear safety regulations.

42 U.S.C. § 2014(hh) provides:

A public liability action shall be deemed to be an action arising under section 2210 of this title, and the substantive rules for decision in such action shall be derived from the law of the State in which the nuclear incident involved occurs, unless such law is inconsistent with the provisions of such section.

¹⁵While this court's ruling that Plaintiffs must establish the existence of a nuclear incident as a threshold element of their claims independently warrants remand, it is proper to nonetheless decide questions of law raised in this appeal that are certain to arise again in the event of a re-trial in order to guide the district court on remand. *See Colo. Visionary Acad. v. Medtronic, Inc.*, 397 F.3d 867, 876 (10th Cir. 2005).

We agree with the district court that § 2014(hh) does not expressly preempt state law. The clear meaning of this section is that state law is only expressly preempted when it is inconsistent with the provisions of § 2210. *See June*, 577 F.3d at 1237; *Lujan v. Regents of Univ. of Cal.*, 69 F.3d 1511, 1518 (10th Cir. 1995). The parties agree § 2210 itself contains no federal safety standards that could provide the standard of care in a PAA action. Instead, § 2210 primarily addresses the indemnification and limitation of liability components of the PAA. Accordingly, § 2014(hh) does not expressly preempt state tort law.

Defendants' remaining preemption arguments focus on conflict preemption.¹⁶ State law is preempted due to its conflict with federal law "where it is impossible for a private party to comply with both state and federal requirements, or where state law stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress." *English v. Gen. Elec. Co.*, 496 U.S. 72, 79 (1990) (citation and quotations omitted). Defendants argue the federal government's regulation of nuclear safety conflicts with the application of state tort law in a public liability action. While the Supreme Court has indicated only the federal government can directly regulate nuclear safety, neither this court nor the Supreme Court has analyzed whether state tort standards of care,

¹⁶Defendants allude to field preemption in their brief, but never develop the issue. At oral argument, counsel was given an opportunity to clarify the nature of Defendants' argument and expressly stated their argument is premised on conflict preemption only. Accordingly, this court does not address field preemption.

which may have some indirect effect on nuclear safety, are preempted by federal law. *See Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm'n*, 461 U.S. 190, 208 (1983).

Because Defendants advocate preemption, they bear the burden of showing that federal and state law conflict. *See Silkwood v. Kerr-McGee Corp.*, 464 U.S. 238, 255 (1984). The court is sympathetic to Defendants' generic argument that directing a nuclear facility to comply with federal safety regulations, while also permitting tort recovery under a generic state tort standard of care, may lead to confusion regarding the levels at which the facility must operate to avoid liability.¹⁷ The existence of such a conflict could defeat one of the PAA's primary purposes, the encouragement of private nuclear development. The record, however, is not clear as to the particular federal regulations or statutes Defendants believe actually conflict with any applicable state tort standards of care during the relevant periods. Nor do Defendants pinpoint any state tort standards of care in the trespass and nuisance context they believe have been displaced by federal nuclear safety regulations.

The district court's orders shed no additional light on this issue. The district court never fully conducted this analysis because it believed the Supreme Court's

¹⁷We note, however, *Silkwood* recognized Congress's willingness to accept the tension between the federal government's exclusive regulation of nuclear safety and the pre-1988 PAA's incorporation of state-law remedies. *Silkwood v. Kerr-McGee Corp.*, 464 U.S. 238, 255-56 (1984).

decision in *Silkwood* established Congress's intent that state tort law broadly govern public liability actions. In *Silkwood*, the Supreme Court concluded punitive damages could be awarded against the operator of a nuclear facility because under the then-existing statutory scheme, including the pre-1988 PAA, Congress intended to permit any tort remedies available under the applicable state law. *Id.* at 256. Applying that principle here, the district court determined the 1988 Amendments did not alter this regime, but rather expressly maintained the applicability of state tort law in PAA actions. *See* 42 U.S.C. § 2014(hh).

But the PAA's requirement that "the substantive rules for decision in . . . [a public liability action] shall be derived from the law of the State in which the nuclear incident involved occurs" does not displace otherwise applicable federal law. 42 U.S.C. § 2014(hh). It merely provides that the PAA itself does not displace state law, unless there is a conflict with § 2210. There are other possible sources of federal law that might preempt state law, and the PAA does not expressly make these standards irrelevant to resolving a plaintiff's PAA action. If Defendants are able to identify federal statutes, regulations, or other binding safety standards that controlled their conduct with respect to the class properties during the relevant time period, the district court must determine whether those particular standards are in conflict with any applicable state tort standard of care.¹⁸

¹⁸Plaintiffs' brief describes the documents which Defendants presented to the district court. These documents appear to reference the applicable safety
(continued...)

On remand, the district court shall permit Defendants to identify the particular federal regulations or statutes they believe preempt state law. Specifically, the district court shall consider whether the federal standards Defendants identify carry the force of law or controlled Defendants' conduct with respect to the off-site contamination that occurred here. Defendants must also indicate the particular standards of care applicable to a state law trespass or nuisance claim they believe are in conflict with any such regulations. Finally, the district court must determine whether any such federal standards actually conflict with the relevant state tort standards of care.¹⁹

¹⁸(...continued)

standards Defendants believe control. The documents include various letters, handbooks, manuals, memos, and Department of Energy Orders. Although it is not clear that any of the standards mentioned in these documents have the force of law or would have controlled the sort of off-site contamination that occurred here, these issues have not been adequately presented to this court. Without a thorough analysis of the statutes or regulations Defendants believe governed their conduct, this court cannot determine whether any conflict exists.

¹⁹This court is aware that at least five other circuits have concluded federal nuclear safety standards control in a PAA action, rather than traditional state tort standards of care. *See In re Hanford Nuclear Reservation Litig.*, 534 F.3d 986, 1003 (9th Cir. 2008); *Roberts v. Fla. Power & Light Co.*, 146 F.3d 1305, 1308 (11th Cir. 1998); *Nieman v. NLO, Inc.*, 108 F.3d 1546, 1552-53 (6th Cir. 1997); *O'Connor v. Commonwealth Edison Co.*, 13 F.3d 1090, 1100 (7th Cir. 1994); *In re TMI Litig. Cases Consol. II*, 940 F.2d 832, 859-60 (3d Cir. 1991). In these cases, however, it appears the courts' holdings were responsive to arguments involving field preemption. As previously mentioned, *supra* n.16, Defendants have not presented a field preemption argument in this appeal. Rather, they have presented only a conflict preemption argument. This court is unable to find any circuit decision based on the conflict preemption argument Defendants present in this appeal.

D. Plaintiffs' Nuisance Claims

Defendants next argue the district court's instructions on Plaintiffs' nuisance claims were legally incorrect. Specifically, Defendants argue Colorado law does not permit a risk-based theory of nuisance which lacks scientific foundation. Defendants also argue that in order to prove they substantially and unreasonably interfered with Plaintiffs' use and enjoyment of their property, Colorado law requires Plaintiffs to show Defendants' emissions exceeded any relevant federal or state safety standards. The court reviews these questions of law de novo. *Martinez*, 572 F.3d at 1132.

1. Irrational Fear as a "Substantial" and "Unreasonable" Interference

Under Colorado law, a plaintiff asserting a nuisance claim must establish an interference with the use and enjoyment of his property that is both "substantial" and "unreasonable."²⁰ *Public Serv. Co. of Colo. v. Van Wyk*, 27 P.3d 377, 391 (Colo. 2001). The district court instructed the jury that Plaintiffs could meet their burden of establishing an interference with the use and enjoyment of their properties if they proved plutonium contamination from the activities at Rocky Flats exposed them to either "some increased risk of health problems" or "a

²⁰On its face, the state-law "interference with use" standard presents a lower threshold than the PAA's "loss of use" standard. Accordingly, if a plaintiff establishes a "loss of use" under the PAA, he necessarily establishes an "interference with use" under Colorado law. This does not, however, relieve a plaintiff of his burden of establishing the additional nuisance requirements under Colorado law that any interference must also be "substantial" and "unreasonable."

demonstrable risk of future harm.” We agree with the district court that a jury may find the presence of radioactive contamination creates an actual risk to health and thereby interferes with a plaintiff’s use or enjoyment of his land if the contamination disturbs the plaintiff’s comfort and convenience, including his peace of mind, with respect to his continued use of the land. *See Cook v. Rockwell Int’l Corp.*, 273 F. Supp. 2d 1175, 1203-04 (D. Colo. 2003). But that is not the end of the inquiry. Any interference with a plaintiff’s use and enjoyment of his property must be both “substantial” and “unreasonable.” Under Colorado law, an interference is deemed “substantial” if “it would have been offensive or caused inconvenience or annoyance to a reasonable person in the community.” *Saint John’s Church in Wilderness v. Scott*, 194 P.3d 475, 479 (Colo. App. 2008). In determining whether an interference is “unreasonable,” the jury “must weigh the gravity of the harm and the utility of the conduct causing that harm.” *Van Wyk*, 27 P.3d at 391.

The jury was properly instructed on the elements of a nuisance claim as well as the definitions of “substantial” and “unreasonable.” While the resolution of these issues typically involves questions of fact, a scientifically unfounded risk cannot rise to the level of an unreasonable and substantial interference. To the extent Plaintiffs rely on anxiety from an increased risk to their health as an interference with the use and enjoyment of their properties, that anxiety must arise from scientifically verifiable evidence regarding the risk and cannot be wholly

irrational. The district court concluded otherwise in light of its review of Restatement (Second) of Torts § 821F, cmt. f, which states:

In determining whether the harm would be suffered by a normal member of the community, fears and other mental reactions common to the community are to be taken into account, even though they may be without scientific foundation or other support in fact. Thus the presence of a leprosy sanatorium in the vicinity of a group of private residences may seriously interfere with the use and enjoyment of land because of the normal fear that it creates of possible contagion, even though leprosy is in fact so rarely transmitted through normal contacts that there is no practical possibility of communication of the disease.

This court previously cast doubt on whether Colorado would follow this rule, given the potential for anachronistic results. *Boughton v. Cotter Corp.*, 65 F.3d 823, 832 n.13 (10th Cir. 1995). Instead, we suggested in *Boughton* that Colorado courts would “require[] some evidence to substantiate the fears.” *Id.* Otherwise, a plaintiff could state a viable nuisance claim any time neighboring property owners contracted a misunderstood disease, whether contagious or not. Such a result would be absurd.

Plaintiffs are unable to point to any Colorado case in the fifteen years since *Boughton* that has endorsed the Restatement’s position. More importantly, the Restatement conflicts with Colorado’s “unreasonableness” requirement, which expressly requires the trier of fact to “weigh the gravity of the harm and the utility of the conduct causing that harm.” *Van Wyk*, 27 P.3d at 391. No reasonable jury could find that irrational anxiety about a risk that cannot be scientifically verified tips this balance so as to render the interference unreasonable. Accordingly, we

now confirm what we previously suggested in *Boughton* and predict that the Colorado Supreme Court would not permit recovery premised on a finding that an interference, in the form of anxiety or fear of health risks, is “substantial” and “unreasonable” unless that anxiety is supported by some scientific evidence. The district court erred in concluding otherwise.

2. The Role of Federal and State Safety Standards

Defendants also argue the district court erred in trying the nuisance claims without reference to applicable federal and state safety regulations. Specifically, Defendants argue the jury should have been instructed that if plutonium contamination in the property class area falls within the applicable federal or state safety levels, it cannot be deemed “unreasonable.” The Defendants point to the Colorado Supreme Court’s decision in *Van Wyk*, where the plaintiffs claimed the defendant’s upgrades to electrical lines created an intentional nuisance due to increased noise, electromagnetic fields, and radiation particles invading the property. *Id.* at 382. The defendant argued the relevant agency’s approval of the voltage involved in the upgrades rendered any interference per se reasonable. *Id.* at 393. The Colorado Supreme Court indicated that to the extent an agency’s regulations actually quantify the standard of reasonableness for the particular conduct involved, this determination controls in the nuisance context. *Id.* Under the facts of *Van Wyk*, however, the court concluded the agency’s determination of reasonableness “lacked any specificity with respect to electromagnetic fields and

noise” such that the complaint stated a viable nuisance claim because it alleged the defendant’s conduct was unreasonable to the extent it exceeded the noise and electromagnetic fields the agency anticipated might occur. *Id.* at 393-94. Under the circumstances, the court concluded the plaintiffs sufficiently pleaded a nuisance claim.

In light of *Van Wyk*, Defendants proposed jury instructions stating Defendants’ release of plutonium could only be found unreasonable if the release did not comply with controlling state and federal standards. The district court rejected this instruction, concluding *Van Wyk* dealt with quasi-judicial determinations that differ in nature from the federal and state regulations identified in Defendants’ proposed jury instructions. The district court believed the safety regulations offered by Defendants were more akin to zoning regulations and ordinances and, under Colorado case law, compliance with zoning statutes does not insulate a defendant from nuisance liability. *Hobbs v. Smith*, 493 P.2d 1352, 1354-55 (Colo. 1972).

This court need not decide whether *Van Wyk* applies here because we agree with the district court’s alternative ruling that none of the regulations referenced in Defendants’ proposed jury instructions are on point. For instance, Defendants rely on a regulation issued by the Colorado State Board of Health which states, “Contamination of the soil in excess of 2.0 disintegrations per minute (0.03 Bq) of plutonium per gram of dry soil . . . presents a sufficient hazard to the public health

to require the utilization of special techniques of construction upon property so contaminated.” 6 Colo. Code Regs. 1007-1:4.60. This regulation says nothing about the minimum level at which such contamination becomes unreasonable. It merely indicates special care must be taken for construction on property contaminated at the particular level indicated. Similarly, Defendants point to documents issued by the Atomic Energy Commission and the Department of Energy. It is not clear whether any of these documents have the force of law or apply to safety levels outside a nuclear facility, and the issue is inadequately briefed for resolution here.²¹

Accordingly, Defendants have failed to establish that any of the state or federal standards referenced in their proposed jury instructions overcome the general rule that the jury must determine whether a given interference is “unreasonable” by weighing the harm against the utility of the interference.

E. Plaintiffs’ Trespass Claims

Defendants next argue the district court erred in failing to require Plaintiffs to prove physical damage to the property as part of their trespass claims.

According to Defendants, this is because Plaintiffs can only pursue intangible

²¹As we previously noted, it is unclear whether Defendants seek to rely on these particular documents as preempting state law. As the issue has not been briefed, the court declines to address the question of whether these documents create a conflict between federal and state law.

trespass claims, given the nature of the contamination at issue. The court reviews this question of law de novo. *Martinez*, 572 F.3d at 1132.

We note Defendants' position that Plaintiffs must establish physical damage to the property as an element of their trespass claims overlaps with the PAA's "damage to property" standard. A plaintiff, however, is not limited to proving damage to property in order to proceed with a PAA claim. Rather, a plaintiff may establish any of the injuries listed in 42 U.S.C. § 2014(q) to meet the PAA's threshold requirement of proving a nuclear incident occurred. For instance, a plaintiff who establishes a loss of use of their property has met his threshold requirement under § 2014(q), but must still prove physical damage to the property in order to prevail on a Colorado intangible trespass claim. Accordingly, we proceed to the issue of whether Plaintiffs' trespass claims must be tried under an intangible trespass theory.

The parties agree that to prevail under a traditional Colorado trespass claim, a plaintiff must establish only "a physical intrusion upon the property of another without the proper permission from the person legally entitled to possession." *Van Wyk*, 27 P.3d at 389. A plaintiff need not establish any injury to his legally protected interest in the land or damage to the land itself. *Id.* In *Van Wyk*, the Colorado Supreme Court recognized the viability of trespass claims involving invasions that are intangible, such as noise, radiation, or electromagnetic fields. *Id.* at 390. Unlike a traditional trespass claim, however, the court made it clear an

intangible trespass claim requires “an aggrieved party . . . to prove physical damage to the property [was] caused by such intangible intrusion.” *Id.*

Defendants argue the instant case can only proceed as an intangible trespass claim, requiring the plaintiff class to establish the existence of physical damage to their properties in order to prevail. Consequently, we must determine whether the Colorado Supreme Court would require a trespass claim involving the invasion of plutonium particles onto real property to proceed as a traditional or intangible trespass claim.

In *Van Wyk*, the Colorado Supreme Court defined “intangible invasion” in the context of the plaintiffs’ inverse condemnation claim, and the court held that invasions in the forms of noise, electromagnetic fields, and radiation waves are intangible invasions. *Id.* at 387. The court explained:

The meaning of the term “intangible” is something that is impalpable, or incapable of being felt by touch. . . . We conclude that noise, despite being perceptible through hearing, is impalpable, and thus, intangible.

Similarly, we also conclude that electromagnetic fields and radiation waves emitted by powerlines are intangible. Neither electromagnetic fields nor radiation waves produced by electric lines can be perceived by *any* of the senses. Instead, they are both similar to television and radio waves, which surround us at all times but which are completely imperceptible. . . . While such waves and fields *might* have some sort of physical effect upon the body, electromagnetic fields and radiation waves of the type at issue here are ubiquitous and our senses are incapable of perceiving them. As such, we agree . . . that electromagnetic fields and radiation waves emitted by powerlines are intangible intrusions upon land.

Id. at 387-88 (citations omitted).

In recognizing that other jurisdictions permitted trespass claims involving intangible intrusions to proceed, the Colorado Supreme Court did more than examine cases involving non-physical intrusions such as noise, electromagnetic fields, and radiation waves. The court also examined cases involving the deposit of particulate not visible to the human eye, as well as the deposit of radioactive materials. *Id.* at 390. At no time did the court in *Van Wyk* draw a distinction excepting these impalpable intrusions from its general analysis.

It is clear from the Colorado Supreme Court's discussion of this issue in *Van Wyk* that, under Colorado law, whether a trespass claim falls under the traditional rubric or must be pursued as an intangible trespass is determined by whether the intrusion is palpable. Plaintiffs do not dispute that the plutonium particles present on their properties are impalpable and imperceptible by the senses. Although we recognize the particles in question have mass and are physically present on the land, our interpretation of Colorado law compels us to conclude that because the particles are impalpable, the trespass alleged here must be tried as an intangible trespass. Consequently, Plaintiffs are required to prove actual physical damage to their properties in order to prevail on their trespass claims.

Plaintiffs argue the discussion of intangible invasions in *Van Wyk* should not control because a more recent case, *Hoary v. United States (In re Hoary)*, 64 P.3d

214 (Colo. 2003), recognized that contamination physically present within property supports a traditional trespass claim. In *Hoary*, the Colorado Supreme Court's decision addressed only the two narrow questions certified by the Tenth Circuit pertaining to whether the contamination of the property constituted a continuing trespass or nuisance. We agree with Defendants that, in *Hoary*, the Colorado Supreme Court treated the presence of contaminants as if it were not in dispute. Indeed, the decision explains, "For purposes of answering the certified questions before us, no dispute exists about whether the United States released TCE into the ground and by doing so, invaded Hoary's property." *Id.* at 222. Because no dispute existed, the *Hoary* court only examined whether the facts in question could support a claim that the trespass or nuisance was continuing. The case does not stand for the proposition that impalpable contamination of property constitutes a tangible invasion that can be tried as a traditional trespass claim. In fact, it is not clear from *Hoary* whether the contamination in question was impalpable. The Colorado Supreme Court never discussed the issue because it was not presented.

Jury Instruction No. 3.3 directed that to prove their trespass claims,

Plaintiffs are *not* required to show that plutonium is present on the Class Properties at any particular level or concentration, that they suffered any bodily harm because of the plutonium or that the presence of plutonium on the Class Properties damaged these properties in some other way.

This was erroneous as a matter of Colorado law and on remand, Plaintiffs shall be required to prove the plutonium contamination caused “physical damage to the property” in order to prevail on their trespass claims. *Van Wyk*, 27 P.3d at 390.

F. Class Certification

As the district court’s class certification analysis failed to consider whether Plaintiffs could establish various elements of their PAA claims, supplied both by federal and state law, this court must reverse the district court’s class certification ruling. Upon remand, the district court shall revisit the class certification question to determine whether Plaintiffs can establish the elements of their claims, including the PAA threshold requirements, on a class-wide basis. Because we now reverse the district court’s class certification ruling, we need not reach the question of whether the district court’s subdivision of the class for damages purposes was proper.

G. Punitive Damages

Defendants also argue the district court erred in instructing the jury that it could award punitive damages in the instant action. Defendants argue the PAA precludes punitive damages against them because their agreement with the federal government requires the government to indemnify them for any such damages. The court reviews this question of law de novo. *Martinez*, 572 F.3d at 1132.

In 1988, the PAA was amended to preclude awards of punitive damages when a defendant in a PAA action will be indemnified by the federal government for damages.²² It states:

No court may award punitive damages in any action with respect to a nuclear incident . . . against a person on behalf of whom the United States is obligated to make payments under an agreement of indemnification covering such incident

42 U.S.C. § 2210(s). The district court concluded this provision applied only as to nuclear incidents occurring on or after August 20, 1988, the date the amendments took effect, and permitted Plaintiffs to pursue punitive damages with respect to nuclear incidents on or after that date.

This court agrees that § 2210(s) is only applicable to nuclear incidents occurring on or after August 20, 1988. Defendants do not dispute that Congress opted not to make § 2210(s) retroactive. Consequently, the bar against punitive damages in this section does not apply to any conduct occurring before the 1988 Amendments took effect. The Supreme Court's decision in *Silkwood* recognized the availability of punitive damages under the PAA, prior to the 1988 Amendments, without reference to an exception in the presence of an indemnity agreement. 464 U.S. at 255-56. Rather, the Court recognized that "in enacting and amending the [PAA], Congress assumed that state-law remedies, in whatever form they might take, were available to those injured by nuclear incidents." *Id.* at

²²There is no dispute that Defendants have entered into indemnification agreements with the government.

256. The *Silkwood* decision made it clear that prior to the enactment of the 1988 Amendments, federal law included no prohibition whatsoever on the availability of punitive damages.

Defendants argue, however, that § 2210(s) merely codified the law as it already existed prior to the 1988 Amendments. But Defendants cite to no binding legal authority suggesting punitive damages were always barred when an indemnification agreement was in place. Nor do Defendants point to any pre-1988 Amendments case prohibiting punitive damages in such an instance. Additionally, the Defendants never explain why the federal government is not entitled to enter into a binding agreement to indemnify a party for punitive damages.

Instead, Defendants rely on two sentences from a Senate Report which states, “The bill clarifies that an award of punitive damages is prohibited if the award would result in any obligation of the United States to make any payments for public liability. This reflects the longstanding policy that the Federal government should not be liable for punitive damages.” S. Rep. No. 100-218, at 11 (1987), *reprinted in* 1988 U.S.C.C.A.N. 1476, 1487. The Senate Report cited by the Defendants, however, could just as easily be read to conflict with Defendants’ position, because after describing the provisions relating to punitive damages, the Report states, “The bill does not otherwise affect current law regarding punitive damages.” *Id.* This suggests those portions of the 1988 Amendments dealing with punitive damages did alter the law as it existed at that

time, and the bar against punitive damages for post-1988 Amendments conduct is the only alteration to the then-existing scheme. Absent any indication punitive damages against an indemnified party were prohibited prior to the 1988 Amendments, we cannot agree with Defendants' position.²³

Defendants also argue that even if punitive damages are recoverable under the pre-1988 PAA, the district court's instruction was erroneous as a matter of law. Specifically, Defendants argue the district court erred by permitting the jury to award punitive damages based on conduct occurring prior to August 20, 1988, even if Plaintiffs sustained no injury prior to that date. In issuing its ruling, the district court noted that the definition of "nuclear incident" refers to "any occurrence within the United States causing . . . damage to property . . . arising out of or resulting from the radioactive, toxic, explosive or other hazardous properties of source, special nuclear, or byproduct material." 42 U.S.C. § 2014(q). Focusing on "occurrence," the district court reasoned, "It is the date of such occurrences, not the date on which the relevant occurrences caused property damage, that determines application of the section's bar on punitive damages awards." *Cook*, 273 F. Supp. 2d at 1212. As a result, the court instructed the jury:

For Plaintiffs to recover punitive damages, they must prove beyond a "reasonable doubt" that the conduct of the Defendant that committed the trespass and/or nuisance was "wilful and wanton." In deciding

²³The parties do not dispute that punitive damages have always been, and continue to be, available against defendants who have no indemnification agreement with the government. *See Silkwood*, 464 U.S. at 251 n.12 & 256.

this question with respect to any conduct relating to plutonium or other radioactive materials, you can only consider the Defendant's conduct up to August 20, 1988, including conduct occurring before this date that resulted in harm on or after that date.

Defendants argue this instruction was error, because it is undisputed the 1988 Amendments bar punitive damages against indemnified parties with respect to any "nuclear incident" occurring after August 20, 1988. Because any occurrence deemed a nuclear incident must cause some injury, Defendants suggest that no nuclear incident can exist until the date of the injury. In other words, Defendants believe the jury should not have been permitted to consider any conduct unless it actually caused a PAA injury under 42 U.S.C. § 2014(q) prior to August 20, 1988. According to Defendants, by instructing the jury it could consider conduct occurring prior to August 20, 1988, which did not result in a PAA injury until after August 20, 1988, the district court equated "conduct" with "nuclear incident" and allowed the jury to consider nuclear incidents for which punitive damages are expressly barred by the PAA's 1988 Amendments.

Defendants confuse the findings necessary to establish a compensable injury, however, with the findings necessary to support a punitive damages award. As explained earlier, a plaintiff cannot proceed with a PAA claim unless it first establishes a nuclear incident occurred. 42 U.S.C. § 2210(n)(2). A plaintiff must establish that the occurrence in question actually caused a PAA injury. 42 U.S.C. § 2014(q). All elements of the PAA claim must be proved to recover

compensatory damages for the injury. With respect to punitive damages, however, once a plaintiff establishes a nuclear incident, the jury's focus must turn to the conduct of the defendant rather than the injury sustained by the plaintiff. The purpose of punitive damages is to punish the defendant's willful and wanton conduct and deter others from engaging in similar conduct. *Lira v. Shelter Ins. Co.*, 913 P.2d 514, 517 (Colo. 1996). The injury resulting from the conduct is compensated separately.

As the district court ruled, the statutory definition makes it clear the relevant date of any nuclear incident is the date of the "occurrence," not the date of the injury. Section 2014(q) defines a "nuclear incident" as "any occurrence . . . causing . . . bodily injury, sickness, disease, or death, or loss of or damage to property, or loss of use of property, arising out of or resulting from the radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or byproduct material." In determining whether a particular occurrence is a nuclear incident, the jury must simply determine whether that occurrence ultimately caused one of the specified injuries. If so, the occurrence constitutes a nuclear incident. Had Congress intended for the injury to control the timing of the nuclear incident, it could have defined nuclear incident as "the infliction of an injury upon person or property arising from the use of nuclear substances." Instead, Congress focused the definition on an "occurrence," the event which sets

the causal chain in motion. Therefore, the date of the occurrence controls when determining whether the nuclear incident took place prior to August 20, 1988.

For instance, if a defendant's release of plutonium in 1985 caused an injury in 1990, a proper explanation of that event in light of the statutory definition would be that the 1985 occurrence was a nuclear incident because it ultimately caused a PAA injury. It would be nonsensical to say the 1990 injury constitutes the nuclear incident even though the conduct occurred years before. The definition directly ties the "occurrence" to the "nuclear incident."

While the district court's decision to focus on the date of the occurrence was correct, its instruction failed to instruct the jury how to identify the date of the occurrence. Here, the "occurrence" constituting a nuclear incident in a PAA action must arise from Defendants' release of plutonium onto Plaintiffs' properties. The jury instruction ultimately given, however, permits consideration of Defendants' conduct prior to August 20, 1988, regardless of whether an "occurrence" causing Plaintiffs' injury took place prior to that date. This is an important distinction, because certain conduct prior to August 20, 1988, might contribute to a nuclear incident, even though the release of plutonium might not have occurred until after August 20, 1988. For instance, if a defendant began improperly storing drums containing nuclear waste in 1987 and consistently failed to maintain them, but no waste leaked from the drums until after August 21, 1988, a jury could not find the "occurrence" took place prior to August 20, 1988.

The district court's jury instruction should have required the jury to determine whether any nuclear incident occurred prior to August 20, 1988. If so, the jury could then consider whether the conduct causing any nuclear incident occurring before August 20, 1988, was wilful and wanton beyond a reasonable doubt. In the event this case is re-tried, the jury should be instructed that in deciding whether to award punitive damages, it may consider Defendants' conduct that contributed to a release of plutonium only if the release of plutonium *both* occurred prior to August 20, 1988, *and* ultimately caused Plaintiffs' injury, regardless of whether the injury manifested itself before or after that date. If the jury finds beyond a reasonable doubt that such conduct was willful and wanton, the jury is permitted to award punitive damages against Defendants.

H. Defendants' Remaining Challenges

The court declines to reach Defendants' evidentiary challenges to Plaintiffs' trial references to the government's indemnity obligations or the Department of Energy's failure to fully comply with discovery. Because the case must be remanded on other grounds, the court need not address whether the district court abused its discretion with respect to evidentiary issues that may not arise during a new trial. Likewise, the court will not address Defendants' challenge to the district court's post-trial award of prejudgment interest. This issue may not arise on remand, and if it does, any error can easily be rectified in a future appeal without necessitating a new trial.

I. Plaintiffs' Cross-Appeal

Plaintiffs have presented their cross-appeal on conditional issues to be raised only if they lose related issues presented in Defendants' primary appeal. As to a number of these issues, Defendants argue Plaintiffs cannot present their cross-appeal in a conditional manner. Defendants are incorrect. A party who prevails in the district court is permitted to conditionally raise issues in a cross-appeal because if the appellate court decides to vacate or modify the trial court's judgment, the judgment may become adverse to the cross-appellant's interests. *United States ex rel. Burlbaw v. Orenduff*, 548 F.3d 931, 942 (10th Cir. 2008).

Some, but not all, of Plaintiff's cross-appeal issues are challenges this court could address in order to guide the district court on remand. Nevertheless, any issues raised on cross-appeal must be adequately presented. *See Berna v. Chater*, 101 F.3d 631, 632 (10th Cir. 1996). As Plaintiffs have failed to do so, we decline to consider the cross-appeal.

IV. CONCLUSION

For the foregoing reasons, this court **DENIES** Defendants' motion to dismiss for lack of subject matter jurisdiction and **DENIES** all other motions pending before this court as moot. Additionally, this court **REVERSES** and **REMANDS** the case to the district court. We **DIRECT** the district court to vacate the judgment and conduct further proceedings not inconsistent with this opinion.