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IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NEW YORK

| | | |
|---------------------------------|-----|------------------------------|
| SHIRLEY IVY, Individually and | [] | |
| as Representative of the Estate | [] | |
| of DONALD IVY, et al. | [] | |
| | [] | |
| Plaintiffs, | [] | |
| | [] | CV-89-03361 (E.D.N.Y.) (JBW) |
| VS. | [] | |
| | [] | [B-89-00559-CA (E.D.TEX.)] |
| | [] | |
| DIAMOND SHAMROCK CHEMICALS | [] | |
| COMPANY, et al. | [] | |
| | [] | |
| Defendants. | [] | |
| | [] | |

FURTHER REPLY ON MOTION TO REMAND

Mrs. Shirley Ivy, James Donald Deloatch, et al., through counsel, respectfully submit the following brief in response to Defendants' Further Opposition to Plaintiffs' Motion to Remand, Point II.

DEFINITION OF PROPOSED CLASS

This brief provides the following information, as was requested by this Court, concerning the class definition that would be proposed in this case after remand to the Texas state court. See Transcript of May 6, 1991 Hearing at 29.

The proposed class representatives, Mrs. Shirley Ivy and James Donald Deloatch, have claims that are typical of the following injured persons and their survivors, who would constitute a plaintiff class in this action:

all persons having state law claims that arose after May 6, 1984 for injury caused by exposure to dioxin-contaminated herbicide supplied to the United States by the defendant manufacturers, who did not knowingly participate in the class action settlement of

Ryan v. Dow entered into on May 6, 1984, either,

1) by failing to opt out of the Ryan v. Dow class action upon receipt of legally sufficient notice of the right to do so, and being adequately represented therein, prior to the settlement of existing claims or,

2) by acceptance of payment from the Ryan v. Dow settlement funds in settlement of claims which arose after May 6, 1984.

STATEMENT OF THE CASE

Plaintiffs have been litigating the propriety of a 28 U.S.C. § 1441 removal of this action from Texas state court since Defendants filed their Notice of Removal on this ground on June 19, 1989. After three other federal courts declined to rule on federal question removal jurisdiction in this case, the issue was fully briefed in this Court and came on for hearing. At the March 6, 1991 hearing, after close of Plaintiffs' argument, this Court set a schedule for still further briefing by the parties and hearing on Plaintiffs' Motion for Remand, and other matters.

On April 23 and 24, 1991 Mrs. Ivy, received filings from three of the Defendants which included four briefs, two motions and related notices, two supporting affidavits incorporating a third by reference, all accompanied by a total of 25 proffered exhibits and 20 more incorporated by reference.

Defendants, in requesting permission for filing "sur-reply papers on the remand issue in opposition to the 97 page reply brief" filed by Plaintiffs, had predicted they would "obviously have a lot to say in response to" Plaintiffs' Reply

Brief on Motion for Remand. See Transcript at 30, 33-34. Plaintiffs' Reply Brief made detailed arguments that Defendants' removal on grounds of federal question jurisdiction was sanctionably frivolous and had been defended with arguments unwarranted by existing law.

The Defendants' new filings allowed by the Courts' March 6, 1991 scheduling order completely changed their strategy for obtaining federal jurisdiction over Mrs. Ivy and her claims. As shown below, Defendants made virtually no reply to any of the arguments made in Plaintiffs' "97 page reply brief." The bulk of Defendants' filings instead sought to shift the basis for this Court's jurisdiction over Mrs. Ivy and her claims to altogether different grounds.

In their new filings Defendants submitted arguments on a variety of alleged alternative grounds upon which this Court could exercise jurisdiction over Mrs. Ivy and her claims. These included Defendants' injunction theory, under the "relitigation" exception to the Anti-Injunction Act, which the Court has indicated it will not grant, [Monsanto's] Reply Memorandum in Further Support of Defendants' Motion for a Permanent Injunction, [Diamond Shamrock's] Memorandum of Law in Support of Defendants' Motion to Dismiss, at 12-23; the theory that this Court has jurisdiction over an "ancillary bill" action, id., at 6 et seq; and the theory that this Court has jurisdiction over Mrs. Ivy because it had already, in 1985, barred or enjoined her from filing her tort claims in state court, id., at 10 et seq.

Defendants also proposed a new ground for removal jurisdiction under 28 U.S.C. § 1442(a)(1), which permits individual federal officials and their agents to remove from state court certain cases brought against them for acts arising out of their performance of federal duties. Defendants requested leave to amend in order to state this newly discovered basis for removal jurisdiction, which relies on factual and legal premises entirely distinct from any that had been litigated in this proceeding over the previous nearly two years. By this last minute shift to a different theory of removal Defendants recast the principal focus of the removal proceeding, for the reason that Defendants' original removal grounds were "defective." [Dow's] Defendants' Memorandum of Law in Support of Motion For Leave to Amend Notices of Removal at 2; [Dow's] Defendants' Further Opposition to Plaintiffs' Motion to Remand ("Further Opposition "), Part I.

Defendants' Motion For Leave to Amend Notices of Removal, in order to satisfy a fundamental premise of the statute under which it may be maintained, was required to admit that the existing jurisdictional allegations in Defendants' 1989 Notice of Removal are "defective allegations," because, under the statute invoked by Defendants, only "defective allegations of jurisdiction" can be amended at such a late date. 28 U.S.C. § 1653. Opposition to Motion for Leave to Amend Allegations of Jurisdiction, May 2, 1991, at 14-16. If Defendants' original § 1441 grounds for removal are defective now, for purposes of

making a late § 1653 amendment, then they were also defective, as Plaintiffs have argued, when they were first filed on June 19, 1989, and during the intervening time down to the present.

Defendants have nonetheless continued the litigation of their "defective" original removal request by submitting, simultaneously with their Motion for Leave to Amend and their various alternative jurisdictional arguments, all of which remain pending, yet another brief defending the same removal theories that were necessarily conceded to be "defective allegations of jurisdiction" by the filing of Defendants' § 1653 motion to amend. In Defendants' Further Opposition, Part II, Defendants purport to find yet further authority for breaching the "well-pleaded complaint" rule, in yet further unwarranted legal arguments.

ARGUMENT

The analysis of Defendants' Further Opposition presented below confirms the appearance of Defendants' abandonment of their defective § 1441 removal grounds in favor of other arguments. Defendants' brief which was intended to respond to Plaintiffs' lengthy Reply Brief, supra pp. 2-3, instead makes virtually no response to any points made by Plaintiffs. Rather than voluntarily withdraw their § 1441 removal request, however, Defendants instead repeat the very same pattern of frivolous argumentation and intentional misrepresentation which they followed in their first brief on the issue.

Defendants' final brief justifying their statutory removal of this case under 28 U.S.C. § 1441 thus provides further

evidence that the original removal of this case by Defendants in June 1989 was improvident and frivolous, and should be subject to payment of costs and sanctions. Dow, on behalf of all Defendants, reasserts two alternative bases for federal question jurisdiction. The three arguments to support the first basis constitute blatant violations of the "well-pleaded complaint" rule. Arguments for the second are contrary to all authoritative precedent.

I. DEFENDANTS REVEAL NO FEDERAL ELEMENT IN PLAINTIFFS' CLAIMS, NOR ANY AUTHORITY FOR FEDERAL QUESTION REMOVAL IN THE ABSENCE OF SUCH AN ELEMENT

The "well pleaded complaint" rule absolutely forbids § 1441 "federal question" removal of a state cause of action from state court on the basis of an asserted federal defense or any other federal issue that need not be proven by plaintiff as a necessary and substantial element of the plaintiff's claim. See Plaintiffs' Reply Brief on Motion for Remand, March 1, 1991, ("Reply Brief") at 20-28. Defendants' arguments do not subtly or indirectly violate this well-settled law of federal jurisdiction. Rather Defendants expressly state that some arguably federal issue or interest, "independent of any claims" in a Complaint, may supply "the necessary federal question supporting jurisdiction under § 1441." Defendants thus argue in clear violation of existing law that a case may be removed under § 1441 "even if all the claims [are] ... purely matters of state law." Further Opposition at 23.

This argument runs directly contrary to any elementary

understanding of the "well pleaded complaint" rule, is entirely unsupported by any case law or scholarship whatsoever, is not designated by Defendants as a good faith argument for the reversal of existing law, and therefore should be sanctioned under the mandate of F.R.Civ.P., Rule 11.

1. Defendants Again Ignore the Requirement
of the "Well-Pleaded Complaint" Rule
That a Federal Question Must Be A Necessary and
Substantial Element of A Claim to Justify Removal

In support of its argument Dow first reprises its bizarre theory that Plaintiffs' state claims are somehow "dependent upon" Defendants' defenses, or other vague federal "issues" and therefore "arise under" federal law. Further Opposition at 24. This theory relies on Defendants' deliberate misstatement of authority. Defendants' Further Opposition presents cases where a federal issue was an element of a plaintiff's state claim, as if the federal issue were a defense, or some other federal interest such as Defendants argue is involved in this case.

This same misrepresentation of cases, and of the law, has been thoroughly discussed and disposed of in Plaintiffs' Reply Brief on Motion for Remand. There Plaintiffs responded to the same kind of deception in Defendants' Memorandum of Law in Response to Plaintiffs' Motion to Remand as is discussed below. See Reply Brief at 24-32, 38-47. Rather than answer Plaintiffs' detailed argument in support of court-imposed sanctions against Defendants' "ostrich-like tactic," id., of ignoring clear, established law and substituting for it deceptive and unwarranted legal argument, Defendants have thus simply repeated the very

same conduct in its Further Opposition.

In their latest brief Defendants add two new ways of recharacterizing their res judicata defense as "issues governed by federal law which must be addressed in deciding plaintiffs' claims." Further Opposition 28. But these two notionally removable federal issues "which must be resolved" in Ivy, id. at 25, are not even alleged by Defendant to be any element of Plaintiffs' claims, let alone necessary and substantial elements of those claims, as is required for federal question removal. See Reply Brief at 20-22, 29-30, 44-45. Therefore the totality of Defendants' argument on its first alleged basis for federal question jurisdiction, including the two arguments discussed below, is simply beside the point.

Defendants attempt to plead their prior class action settlement in Ryan v. Dow as a "federal question" in this suit by claiming that Mrs. Ivy was a party to that earlier suit. Even if Mrs. Ivy was a party to Ryan v. Dow, a proposition which she vigorously contests elsewhere on the facts, that settlement would constitute a defense and not any component of a claim pleaded by Mrs. Ivy in this suit. The five cases cited by the Further Opposition at 23-24 to support Defendants' theory of federal question removal, which theory would abolish the "federal element of the claim" requirement, in fact have nothing whatsoever to do with Defendants' unique theory.

Two of these cases, Harms and Warrington, denied the existence of federal jurisdiction where there was an element of

federal law involved in Plaintiff's claims, but it was merely an "incidental or collateral federal question". 463 F.2d at 772. Defendants here do not so much as allege that there is even an "incidental or collateral" federal element in any of Mrs. Ivy's claims.

The other three cases stand for the proposition that a state cause of action embodying a "substantial federal question" may be removed. West 14th, 815 F.2d at 193. All three of these cases mentioned the specific federal statute that "provide[d] the source of the right or duty claimed in the suit." Garrett, 502 F.2d at 630. One of these cases also relied upon a specific statute which legislated an exception to the "well-pleaded complaint" rule by expressly permitting removal of certain federal issues raised under that statute by way of defense. Mountain Fuel, 586 F.2d at 1379. No such federal statute applies to this case.

All five of the cases cited by Defendants subscribe to the fundamental and venerable rule that federal jurisdiction does not exist if plaintiffs' "cause of action does not have as an essential element, a right or immunity created by the Constitution or laws of the United States." Warrington, 463 F.2d at 772. There can be no question, and Defendants do not deny, that Plaintiffs' exclusively state-law causes of action contain no such federal element. Defendants' attempts at citing yet additional authority for their unwarranted theory has failed to overcome the absurdity of arguing that their defense of res

judicata based on a previous settlement has somehow become embodied as an element of Plaintiff's claims. Reply Brief at 25-36. Defendants' latest attempt to brief this issue once again proves that there is no authority of any kind which supports such a contrary notion.

2. The Court's Fiduciary Duty to Protect
Absent Class Members Bears No Relationship
To Any Element of Plaintiff's Claims, And
Would Be Better Served by Remand

For their first new "federal issue," offered as a substitute for the "element of the claim" required by the well-pleaded complaint" doctrine, Defendants invoke the duty of the Court under F.R.Civ.P. Rule 23(e) when approving a class action settlement. This "fiduciary duty" under the notice and approval provision of Rule 23(e) authorizes the court to protect "rights of absent class members" when approving a settlement. Grunin, Further Opposition at 25, 28. These would include such rights as would be violated if potentially valid claims of absent persons were settled for mere "nuisance value" without their knowledge and without adequate representation of their interests, when such interests actually conflicted with those of persons who purportedly made such a settlement and who thereby increased the settlement value of their own claims by doing so. Plaintiffs contend that there is no clear evidence that such a settlement of Mrs. Ivy's claims was made or ordered in this case.

The George case cited by Defendants' Further Opposition, at 25, explains this fiduciary obligation as involving a judgment that the settlement of a class action was not collusive and that

the "number of objectants is small." 77 F.R.D. at 424. First, an issue would be raised as to collusion, if, by "a post hoc judgment as to what the order was intended to say," Chick Kam Choo v. Exxon, 486 U.S. 140, 148 (1988), the future claimants are now included in a settlement in which their interests were not represented. The injured claimants who in 1984 had weak claims, and their attorneys, would profit from any ambiguity they knowingly allowed, in collusion with Defendants, concerning a clearly inadequate settlement of the future, potentially valid, and therefore conflicting claims of absent uninjured persons.

The attached Affidavits of Admiral Zumwalt and Dr. Jenkins, Exhibits H and I, show that a combination of political manipulation, incomplete data, and, most important, a long latency period weakened the evidence available in 1984. Predictably, some of those constraints have now been overcome, giving the current claimants much stronger evidence than was available in 1984. The settlers having weak claims, who would also have had to purport to represent the absent future claimants for such a settlement of their claims to have occurred, had a serious conflict with the interests of future claimants some of whom had predictably stronger claims

Second, even the objections by the injured veterans to the 1984 settlement of existing claims was large, and included the forceful opposition of the lead representative named plaintiff for injured claimants, Michael Ryan. But no 1984 future claimant or class representative was heard to support the

settlement of their potential claims at all, and those who are now heard from oppose it. The fiduciary duties toward the absent future claimants would obviously not be served by a post hoc interpretation approving a "nuisance value" settlement of their claims, especially when the reasons for approving such a cheap settlement of the claims presented in Ryan are no longer valid. Of the two reasons, the first, insufficient evidence, is shown by the Affidavits of Admiral Zumwalt and Dr. Jenkins, Exhibits H and I, to have been overtaken by time. The second, the application of the Government contractor defense to Agent Orange claims, has been disavowed by the Court of Appeals. In re Joint Eastern and Southern District New York Asbestos Litigation, 897 F.2d 626 (2d Cir. 1990).

The role of the court in approving the settlement, see Grunin, or awarding fees, see City of Detroit, in the previous case does not extend the jurisdiction of the court once that task is complete, and the case has been dismissed. Rule 23(e) does not provide an ongoing commission to protect this same class long after the case is settled and dismissed, as Defendants suggest. The Court's Rule 23(e) duty was discharged when the settlement was approved and fees awarded. Rule 23 does not appoint any particular federal judge as the permanent guardian of all Vietnam veterans who were absent class members of the first suit, to have permanent jurisdiction over them, even after the approval is completed and the case is dismissed. Defendants cite no case suggesting such a basis for thus extending the jurisdiction of

this Court. The veterans are fully capable of looking after their own rights in any subsequent litigation, and other courts are fully capable of enforcing any orders "to protect the interests of class members," Further Opposition at 28, which this Court has had jurisdiction to issue.

The rights of absent future claimants were of course not protected if the settlement is now interpreted to include such persons whose clear interest it was not to settle. As to the persons who did settle, their interests were protected at that time. Moreover it is beneficial for this class not to have to share its meager settlement funds with additional persons who were not parties to the class action at the time of the settlement and do not wish to become so now.

Defendants argue that the court should "protect the interests of class members who did not participate in the negotiations," id. at 28, by denying many of them their state law rights to a trial of their claims in the Ivy class action. Defendants elsewhere explain this apparent paradox as an indirect means of avoiding Defendants' claim for indemnity from the Settlement Fund. Defendants argue that the Settlement Funds' indemnity for state court judgments up to a total of \$10 million liability, would justify removal, see Defendants' December 18, 1990, Memorandum of Law in Support of Permanent Injunction, at 16, although other far less drastic measures are readily available to prevent any depletion of settlement funds that are not expressly set aside for this purpose by the indemnification

provision in the Settlement Agreement itself. See Reply Brief, at 70-72.

Other considerations make this idea truly preposterous. First, Defendants have no standing to argue the rights of others, particularly the rights of other veterans who allege they have been injured by Defendants. There is no reason to believe that any Vietnam veteran would deny a fellow veteran, or family member, an opportunity for justice in this matter because of some arguable, contingent, financial interest in the Fund.

Second, no claimant against Defendants whose recourse is limited to the Settlement Fund would rationally make the argument presented by Defendants. Defendants have asserted that Mrs. Ivy's class action suit will involve potentially more claims than were included in the action that produced the Settlement Fund. See Memorandum of Law in Support of Permanent Injunction at 18. This is now confirmed by the Affidavit of Dr. Jenkins, Exhibit H, which shows there is a 20 years or more latency period for dioxin injuries. It is unlikely that many claimants who could opt for a trial of their claim through participation in Mrs. Ivy's suit would even consider making a "nuisance value" claim on the Settlement Fund. Ivy will therefore divert a large number of claims away from the Settlement Fund. Ivy should theoretically at least double the funds available to non-Ivy claimants who can only resort to the Settlement Fund. It is virtually certain that those veterans who claim from the Fund will have far more than an additional \$10 million to share if the Ivy class action is

remanded for trial in Texas.

If this Court were empowered to act as a fiduciary of one party, rather than a neutral interpreter and administrator of the written terms of the actual settlement agreement, the Court would do the opposite of what Defendants' request. It will serve neither those Ryan class members who have no recourse but to make claims on the Settlement Fund, nor the purported absent class members represented in Ivy, to limit the Ivy class to their claims on the Settlement Fund. The protection of the Fund and the rights of absent class members sought by Defendants would both best be served by remanding the Ivy class to Texas so that the approximately half or more of the "Agent Orange" victims represented in Mrs. Ivy's class action will not make claims on the Settlement Fund in New York.

If the Court fulfills its role as an administrator it will also remand under the plain terms of the Settlement Agreement. The agreement contemplates that there will be state claims tried in state court and does not express any intention to prohibit those cases, but rather to provide Defendants limited insurance against them.

**3. Inherent Jurisdiction Is no Basis for Removal
And Is Inappropriate In This Case**

Defendants cite eight cases for the proposition that the court has inherent and continuing jurisdiction over a class action settlement. Further Opposition 26-28. One case, Munz, involved an agreement that expressly provided for continuing jurisdiction over a class action settlement. Davis and Oregon

have nothing to do with jurisdiction. Two of these cases, Fairfax and Libby, involve dicta in decisions denying federal jurisdiction on the basis of holdings that settlements are contracts that belong in state court, unless the original case is reopened. A cited law review article, 10 Cardozo L. Rev. 2137, concerns the same subject.

A sixth case, McCall-Bey, has been discussed in the Reply Brief at 79-80. It also stands for the proposition that a settlement is a contract that should be enforced in state court, unless the case is reopened. The settlement in this case, which Defendants allege included Mrs. Ivy's claim, has not been reopened. Mrs. Ivy's case cannot be addressed unless the class settlement is also reopened as a whole, because the settlement itself did not address her case as an individual case. If the Ryan settlement were reopened, it would lose its res judicata effect, and, in light of changes in law and evidence, Reply Brief 63-69, it could not be sustained today as a fair settlement for absent future claimants, even if they were parties to the 1984 settlement.

The remaining two cases cited by Defendants are from the Second Circuit. They state only that a settlement can be summarily enforced in a case then before the court. The meaning of a brief statement in Tandy is illuminated by the cases it cites. For example in Autera v. Robinson, 419 F.2d 1197 (D.C. Cir. 1969), relied upon by the Second Circuit in Tandy., the D.C. Circuit stated in dicta that a trial court has power, where not

inappropriate, to "summarily enforce" a settlement agreement "while the litigation is pending before it." However the court goes on to hold that summary procedures "are ill-suited to situations presenting complex factual issues related ... to the formation of the contract."

The Ryan litigation is not pending before the court. It has been dismissed. No issues remain to be litigated. The court is presently fulfilling an administrative role with respect to the Fund. The Fund was the outcome of the litigation, but was not an issue in the litigation itself. Defendants' contention that Mrs. Ivy settled her claims in Ryan involves "complex factual issues ... related to the formation of" a putative contract with Mrs. Ivy, which she contends never existed.

Even if Plaintiffs were to concede the principle advocated by Defendants, that a court has inherent or continuing power to enforce and interpret its own orders, under certain circumstances, even in litigation no longer pending before it, this still would not help Defendants' argument for jurisdiction. First, Defendants present this principle as a ground for removal. But inherent or continuing jurisdiction of this court is irrelevant to the necessary federal element of Plaintiffs' claims for § 1441 removal. Unless there are federal elements in Plaintiffs' claim there can be no removal.

Federal removal jurisdiction is provided by and defined by federal statute. There is no statute permitting a federal court to remove a case because the court may have concurrent

jurisdiction over some aspect of that case. If a federal court seeks to exercise its powers of inherent or continuing jurisdiction to interfere with the concurrent powers of a state court, then it cannot do so by statutory removal, but only by exercise of its equitable powers.

Second, if, by placing this argument in a brief on removal jurisdiction, Defendants seek removal jurisdiction under some hitherto unknown form of analogy to inherent or continuing jurisdiction, the analogy fails because that jurisdiction could not be exercised here. The exercise of equity powers by a federal court to interfere with the jurisdiction of a state court is closely hedged in by equity doctrine, the abstention doctrine, principles of federalism, and the Anti-Injunction Act, 28 U.S.C. § 2283. Any one of these limitations is sufficient to preclude the Court from interfering with the state litigation of Ivy. Reply Brief at 83-96. For example, the "relitigation exception ... [of the Anti-Injunction Act] protects only matters that have actually been decided." Staffer v. Bouchard, 878 F.2d 638, 643 (2d Cir. 1989). But Mrs. Ivy's cause of action in this case could not have "actually been" litigated and decided in 1984 because it did not exist then.

Even if it is assumed that this Court did incorporate the settlement agreement into the court's own order, a consent decree "is a form of judgment," Oregon, 913 F.2d at 580, and is subject to the rule of Chick Kam Choo v. Exxon, 486 U.S. 140, 148 (1988), and Atlantic Coast Line R.R. v. Brotherhood of Locomotive

Engineers, 398 U.S. 281 (1970), which prohibit the injunction of a state court proceeding on the basis of a federal court's later interpretation of its own judgment. Therefore, not only would the Anti-Injunction Act, and the other limits on federal equitable interference with state courts mentioned above, prevent this Court from exercising any inherent or continuing jurisdiction it may have, but the latter Supreme Court cases would prohibit the Court from even considering the contested issue of whether Mrs. Ivy's claims were before the Court in 1984. Removing this case under some non-statutory analogy to the Court's inherent and continuing bases for jurisdiction would simply constitute an illegitimate end-run around well-established restraints on the powers of the federal courts to interfere with state court proceedings.

Third, none of the cases cited involves a situation where the court lacks personal jurisdiction over a party. Here, even if the court has authority to interpret its order in Ryan and bind the parties that were before it, Mrs. Ivy was not before the court in the Ryan case to be bound by any order in that case. She lacks minimal contacts with this forum and has never consented to the jurisdiction of this Court.

II. NO ACCEPTED PRECEDENT SUPPORTS THE
"ELECTION OF FEDERAL REMEDY" REMOVAL OF IVY

Plaintiffs have discussed Defendants' second basis for removal jurisdiction in the Reply Brief, Part II, Sec. 3, under the rubric of "election of remedy." Because of its novelty and uncertain basis, this ground for removal jurisdiction has not yet

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acquired an accepted designation in the cases. A corollary to the "well pleaded complaint" rule, the "election" rule applies when a state claim identical to a federal claim already adjudicated in federal court is pleaded in state court. The state claim is said to be "federalized," through a kind of election of, and merger in, the federal claim. Such a "federalized" state claim can then be removed from state to federal court.

1. **The "Election of Federal Remedy" Rule Does Not Apply to Ivy Because Defendants Allege No Prior Election of a Federal Remedy By Mrs. Ivy**

As discussed in Plaintiffs' Reply Brief, at ⁵¹50 & n.⁵8, the "election" rule stated above has no application to the Ivy case because the alleged prior litigation of Mrs. Ivy's claims involved exclusively state claims.

Nevertheless Defendants' Further Opposition revisits their mistaken understanding of this rule. Defendants would like to convert the rule into a means to remove to federal court a res judicata defense against the relitigation of state claims. They repeat the same misrepresentations about cases such as Striff and Sarkisian that were already exposed in Plaintiffs' Reply Brief, without attempting to meet Plaintiffs' arguments, or mentioning that the state claims were removed from state court in these cases only where the claims previously litigated in federal court were federal claims.

The only new case cited by Defendants, Her Majesty The Queen, Further Opposition at 30, confirms the reading of Striff

given in Plaintiffs' Reply Brief at 53-54 & n.6. Contrary to Defendants' contention that Striff involved "election of federal remedy" removal, the new Sixth Circuit case cited by Defendants confirms that Striff was a traditional "artful pleading" case where plaintiff's complaint attempted to conceal a federal element inherent in his claim.

Defendants' assertion that Striff involved removal of "wholly state claims" simply repeats a deliberate misrepresentation of the facts of that case, as already pointed out in Plaintiffs' Reply Brief and now confirmed by Her Majesty The Queen, which clearly characterizes the claim in Striff as containing a federal element. 874 F.2d at 339.

Defendants also repeat their deliberate miscitation of Sarkisian for the proposition that it "permits removal only of claims this plaintiff actually litigated in federal court," Further Opposition at 30. But Sarkisian makes clear that the rule permits removal only of state claims that the plaintiff had "foregone," i.e. not litigated in the previous federal action, but which state claims were identical to the prior federal claims. See Reply Brief at 52-53.

2. The "Election of Federal Remedy" Rule Does Not Apply Here Because Mrs. Ivy's Claims in This Case That Did Not Exist in 1984 Could Not Be "Identical" to Any Claims of Hers Litigated in 1984, Federal or State

Defendants' point out that the Second Circuit in Sarkisian has interpreted the "election" rule to permit removal of a plaintiff's "state claims ... virtually identical to claims previously brought in federal court by that plaintiff." Further

Opposition at 29. Defendants cannot satisfy this condition for application of the rule, that identical claims must have been previously brought by "that plaintiff," Mrs. Ivy. So instead they assert that "Plaintiffs are raising claims that are identical to claims the class of which they are members chose to litigate in federal court." Id. This circumlocution is simply irrelevant, in light of Sarkisian.

First, neither Mrs. Ivy nor anyone on her behalf did or could have litigated any claims "brought by" Mrs. Ivy in the federal court action settled in 1984 that were identical to those pleaded here, because the claims pleaded here did not exist in 1984.

Second, Defendants' assertion that Mrs. Ivy is a member of a class who litigated similar claims is merely gratuitous. Mrs. Ivy strongly denies that she consented to participate in such a class action suit, or that the Court had jurisdiction over her or her claims in 1984, irrespective of whether she was a "class member." She received no notice, and none was sent concerning future claims; those who would have represented her had a conflict of interest due to the predictable difference in the weight of the evidence supporting their respective claims maturing before and after 1984. See Affidavits of Dr. Jenkins and Admiral Zumwalt, Exhibits H and I. Infra p. 30 et seq.

A court lacks jurisdiction over an absent class member who receives inadequate notice and representation. Without such jurisdiction no claim of Mrs. Ivy could have been litigated,

whether or not the claims of other class members were litigated. If Mrs. Ivy did not previously litigate her identical claim in federal court the "election" rule cannot be satisfied

Third, even aside from jurisdictional problems, how could Mrs. Ivy be, in 1984, a member of a class who litigated such claims as she presents here if she did not have any such claims to litigate then? The short answer to this puzzle is that she was not a member of any class that litigated claims in 1984, precisely because she did not have a similar claim to litigate. No claim of a representative party in Ryan was "typical" of the non-existent claim of Mrs. Ivy.

Whether someone else at that time litigated their own claims which were similar to Mrs. Ivy's claims in this action does not, under F.R.Civ.P., Rule 23(a)(3), make her retroactively one of those persons who constituted a class possessing similar claims settled in 1984 and dismissed. What differently situated persons did in 1984 is irrelevant to whether a class representative similarly situated to Mrs. Ivy elected, on her behalf, a federal forum for claims in 1984 identical to her claims in this case, as would be required to trigger the "election" rule. Reply Brief 50-51. This is logically impossible because a similarly situated person to Mrs. Ivy in 1984 had no claim, and therefore could not satisfy Rule 23(a)(3)'s requirement that permits a class action "only if ... (3) the claims ... of the representative parties are typical of the claims ... of the class."

This Court stated in its certification of the Ryan class, less than five months prior to settlement, that class membership depended upon a subjective determination by any potential member that he or she was injured. In Re Agent Orange Product Liability Litigation, 100 F.R.D. 718, 728-29 (E.D.N.Y. 1983). A person such as Don Ivy who did not claim to have injuries from exposure to Agent Orange in 1984, could not be held to have made a subjective determination in 1984 that he was so injured. Objectively and subjectively he was not "injured" in 1984 and did not come within the class definition.

**3. Defendants' Additional Misrepresentations
Further Demonstrate the Frivolousness of
Their Removal of This Case**

After totally avoiding the arguments in Plaintiffs' Reply Brief, for which Defendants had specially requested additional time to respond, supra pp. 2-3, Defendants, in the last two pages of their Further Opposition, at 30-32, finally do mention, and attempt a response to, several arguments they attribute to Plaintiffs. Instead of addressing the numerous arguments in Plaintiffs' Reply Brief, to which they have no answers, Defendants chose to misrepresent several of Plaintiffs' arguments in order to create some issues to which they can make a response. Plaintiffs will counter each of Defendants' references to Plaintiffs' Reply Brief separately, to demonstrate what a lame response Defendants have made to Plaintiffs' thorough demonstration that Defendants' § 1441 federal question removal of this case was sanctionably frivolous.

First, Defendants state that Plaintiffs attack "the Sarkisian rule, describing it as not well established or well articulated." Further Opposition at 30. Of course Plaintiffs' Reply Brief actually said nearly the opposite, that what is called here the "election of federal remedy" rule "has not been well articulated ... other than [by] Sarkisian and several Ninth Circuit cases." Reply Brief at 50 (emphasis added). Sarkisian itself similarly observed that the "election" rule's origin in a 1981 Supreme Court "footnote provides little illumination." 794 F.2d at 760. This is not an attack on the rule, but an accurate observation. Further evidence of this is that after Defendants have combed all the cases on the subject, they are still confused about the rule, as shown below.

Second, Defendants attribute to Plaintiffs, without a page reference, the idea that removal under the "artful pleading doctrine is merely another way to state a res judicata defense." Further Opposition at 30. However this is precisely what Plaintiffs accuse Defendants of attempting to make of the "election of federal remedy" rule, by trying to apply it to the relitigation of state claims. Reply Brief at 48. It is clear from Sarkisian that "election of federal remedy" removal of state claims not previously litigated, but "federalized" because identical to federal claims litigated in federal court, does not permit removal simply because Defendants have a res judicata defense. Reply Brief 52. But by claiming that any prior federal judgment on state claims permits removal of those claims if

relitigated, Defendants attempt to convert the narrow "election" rule into a "removal of res judicata defense" rule, for identical claims. Plaintiffs reject this interpretation as unsupported by any accepted precedent.

Third, Defendants attack precedent cited by Plaintiffs which expressly limits the rule to those cases that, unlike this case, involve prior litigation of federal claims. Further Opposition at 30. Because all of the actual judicial decisions on the rule either expressly or implicitly reject Defendants' theory of the rule, Defendants attack this uniform case law on the subject as "render[ing] the artful pleading doctrine meaningless." Further Opposition at 31.

The "election of federal remedy" rule has little to do with the traditional uses of the artful pleading doctrine. That doctrine will retain all its traditional meaning even if the new "election" rule were packed back into the 1981 Supreme Court footnote from whence it came, never to be heard again. Defendants' real complaint is that, as applied and defined in actual cases, neither the artful pleading doctrine nor the "election of federal remedy" rule has any meaning for this case.

Frustrated by the actual judicial decisions on the subject, none of which support Defendants' theory, Defendants finally simply pose a question which they do not try to answer. Their quandry well captures their confusion over the "election" rule.

If the claim is in fact federal in nature without a prior federal judgment, what does the prior federal judgment that is so central to the reasoning in Moitie and

Sarkisian add?

Further Opposition at 31. The meaning of the question may not be easy to grasp. But the answer is simple. Neither Moitie nor Sarkisian say anything about prior federal judgments. In the short Moitie footnote, the term never appears. Nor does the concept figure into the detailed analysis in Sarkisian, which states, in its key passages that the state claims of a plaintiff who previously "elected to proceed in federal court" may be removed only if they are "identical to [a previous] claim expressly grounded on federal law." 794 F.2d at 760 (emphasis added). It is clearly the prior federal claim that is "so central to the reasoning" here, and not a federal judgment on state claims which is nowhere mentioned. The Moitie footnote also mentions "essentially federal law claims," but nothing about federal judgments. The full extent of Defendants' confusion is demonstrated in this inability to read the key cases accurately, which confusion is undoubtedly a product of their strained effort to distort the "election" rule to fit this case. It is no surprise that the answer to Defendants' question is that their assumptions are wrong. Also a federal judgment assures that the identical federal claims were litigated on the merits in federal court.

In a fourth reference to Plaintiffs' Reply Brief, Defendants allege, without a page cite, that Plaintiffs say Sarkisian and Striff mention the prior federal claim requirement of the "election" rule. Defendants do not find such mention

there. Further Opposition 31. As explained above, Defendants have had other difficulties reading Sarkisian, which clearly refers to a "claim expressly grounded on federal law" in its key passage defining the elements of the rule.

Defendants have also apparently had trouble reading Plaintiffs' brief, which showed at some length that the "ruling in Striff did not, as Defendants suggest, involve the 'election of remedies corollary' in any way." Reply Brief at 54. Since that case is not at all relevant to the "election" rule it is natural that it does not discuss any aspect of the rule. Contrary to Defendants' misstatement, Plaintiffs did not say that it did.

Fifth, Defendants allege, again without a page reference or quote, that "plaintiffs are arguing for a change of law in this circuit." Further Opposition at 31. Of course, Plaintiffs have not made such an argument because, as demonstrated above, the law of the Second Circuit, as stated in Sarkisian, prohibits an "election of federal remedy" removal of this case.

Defendants support their statement by the following tortured argument: Plaintiffs rely on the express statement of the rule in Ultramar America v. Dwelle, 900 F.2d 1412, 1417 (9th Cir. 1990) that "when the prior federal judgment was grounded in state law, the state claims contained in a subsequent action filed in state court cannot be recharacterized as federal law for purposes of removal." Reply Brief 54. Ultramar is a Ninth Circuit case. Another Ninth Circuit case, Sullivan, has

critiqued the logical premises of the "election" rule as set forth in Sarkisian. Therefore Plaintiffs want to change Sarkisian

There are more than logical flaws in this argument. First, it is the premises of the "election" rule stated in Sarkisian, not the premises stated in Sullivan, that Plaintiffs have consistently advanced. Second, the Sullivan premise for its critique of Sarkisian was expressly abandoned in large part by the Ninth Circuit's decision in the Ultramar case itself, the same Ninth Circuit case that was relied upon by Plaintiffs. Ultramar carefully explained that the premise for the rule suggested by Sullivan, which, like Defendants' theory, emphasized the existence of a prior federal judgment, would provide no basis for removal when "there is not a federal claim in sight, and removal is impermissible even though res judicata probably bars the suit." 900 F.2d at 1416.

As the Ninth Circuit's position has now been explained in Ultramar, there is no express or implied inconsistency between the Ninth Circuit's and the Second Circuit's interpretation of the rule. Both Circuits expressly reject the removal of a res judicata defense as Defendants seek in this case.

Once again Defendants allegation reverses reality, which is that their position more closely resembles the rejected Sullivan theory than it does the Second Circuit's theory with which Sullivan differed, although even Sullivan did not approve Defendants' theory. Therefore it is the Defendants, not

Plaintiffs, who must seek a change in the law of both the Second and Ninth Circuits to prevail on their federal question removal of this case.

SUBMISSIONS OF PROOF

Appended as Exhibits to this Brief are the Affidavits of Dr. Cate Jenkins, Ph.D. and of Admiral Elmo R. Zumwalt, Jr. to support Plaintiffs' allegations that any attorney or class representative who attempted to represent and settle Mrs. Ivy's claims had a conflict of interest. At the May 6, 1991 hearing the Court permitted Mrs. Ivy to proffer support for her argument concerning the state of the scientific evidence of causation in 1991 in contrast to the state of the evidence at the time of the "nuisance value" settlement in 1984. See Transcript of May 6, 1991 Hearing, at 23.

In connection with the 1984 and 1985 settlement and dismissals the Court had held, as to the Agent Orange exposure claims then existing and before the court in In Re Agent Orange Product Liability Litigation, that the scientific evidence on the element of causation of injuries by Agent Orange was insufficient to support their submission to a jury. Mrs. Ivy contends that the Court's holding cannot be applied to claims now pending before a court in 1991, because, with the passing of time, the proof of causation of a range of injuries by dioxin has dramatically improved.

It has been Admiral Zumwalt's official duty to assess the relevant scientific studies as to the effects of dioxin on the

health of Vietnam veterans, for the Department of Veterans Affairs. Admiral Zumwalt testifies, on the basis of the investigation he made in the course of his official duties, that any "conclusion made in 1984 denying that Vietnam veterans were injured by their exposure to Agent Orange was made on the basis of inaccurate and incomplete data, and therefore, in light of information currently available, has no scientific validity." Exhibit I at 12.

Dr. Jenkins holds a doctorate in chemistry and is an expert in assessing the health effects of toxic substances, having particular experience with dioxin in the course of her duties at the EPA. Her comprehensive presentation of the scientific studies on dioxin shows that there is now evidence of causation of human health effects by dioxin of the kinds claimed by Plaintiffs, that is clearly sufficient to permit Plaintiffs to have a jury decide whether their exposures to dioxin caused the injuries they complain of in this matter. Dr. Jenkins testifies that,

complete and adequate evidence of causation from studies of Vietnam veterans could not have been expected to exist in 1984. It is simple scientific logic that epidemiologic data could not be complete until at least each complaining veteran's injury that arose within the known latency period has been counted. According to the studies reported below that average latency period is 20 or more years for dioxin injury by cancer. The consequence of violating this logic was a finding of no evidence of causation in 1984, long before the end of the latency period, whereas in 1991 such evidence supporting a causal relationship between dioxin and Vietnam veteran's injuries exists to a reasonable degree of scientific certainty.

Conclude

This dramatic improvement in the quality of proof, which converts the anecdotal and other evidence found insufficient in 1984 into the statistically significant and legally admissible scientific evidence of 1991, could have been clearly anticipated in 1984. Therefore it would have constituted a serious conflict of interest for attorneys who settled claims insufficiently supported by evidence in 1984, to have grouped those claims with future claims such as Mrs. Ivy's, which did not exist in 1984. Such claims predictably would be supported by far more adequate evidence once they did arise, after more complete statistics on the extent of injury became available closer to the end of the long latency period for manifestation of dioxin injuries.

It does not appear that any lawyer in the In Re Agent Orange Product Liability Litigation did expressly and unambiguously purport to settle such future claims. But had any lawyers in fact done so their representation of absent persons whose claims had not yet arisen in 1984, would have been clearly inadequate due to this conflict of interest. Such representation would also have been inadequate as to Plaintiffs who now have such claims because a settlement of potentially substantial unmatured claims of unknown persons for mere nuisance value (for deaths and total disability) or nothing at all (all other claims) would constitute malpractice as to them.

These affidavits show that unlike 1984, there is now ample evidence associating dioxin with a range of health problems which can prove that exposures to dioxin caused certain injuries

of the kinds complained of in this action. On the basis of such evidence a jury recently awarded \$1.5 million for a soft cell sarcoma victim of dioxin exposure. Overmann v. Syntex (USA) Inc., et al. No. 852-02681 (Div. 5, Circuit Court, City of St. Louis, Mo. July 10, 1991).

CONCLUSION

Defendants' "sur-reply" fails to question, qualify or refute any argument in Plaintiff's Reply Brief. Nor does it raise any new grounds warranted by existing law to support its June 1989 Notice of Removal. Therefore it provides further support for the conclusion of Plaintiffs' Reply Brief that Ivy was improvidently and frivolously removed from Texas state court under 28 U.S.C. § 1441. Plaintiffs respectfully request that Ivy be remanded to Texas and that their costs and reasonable attorney fees for opposing this removal be awarded.

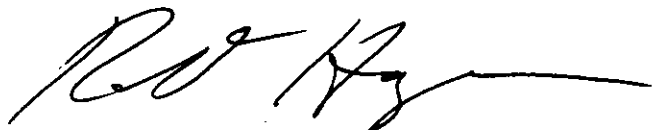
Respectfully submitted,



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CERTIFICATE OF SERVICE

The undersigned hereby certifies that one copy of the foregoing FURTHER REPLY ON MOTION TO REMAND and accompanying Exhibits, was served on this 4th day of September, 1991, by deposit in the U.S. Mail, first class postage prepaid, to John C. Sabetta, Esq., Lord Day & Lord, Barrett Smith, 1675 Broadway, New York, N.Y. 10019-5874, attorney for Monsanto Corporation; Rivkin Radler Bayh Hart & Kremer, EAB Plaza, Uniondale NY 11556-0111, attorneys for Dow Chemical Corp.; and Michael M. Gordon, Esq., Cadwalader, Wickersham and Taft, 100 Maiden Lane, New York, N.Y. 10038, attorneys for Diamond Shamrock Chemicals Co.



IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF NEW YORK

SHIRLEY IVY, Individually and as
Representative of the Estate of
DONALD IVY, *et al.*

Plaintiffs,

v.

DIAMOND SHAMROCK CHEMICALS
COMPANY, *et al.*

Defendants.

CV-89-03361 (E.D.N.Y.) (JBW)

[B-89-00559-CA (E.D.TEX.)]

AFFIDAVIT OF CATE JENKINS, PH.D.

RECENT SCIENTIFIC EVIDENCE
DEVELOPED AFTER 1984
SUPPORTING A CAUSAL RELATIONSHIP BETWEEN
DIOXIN AND HUMAN HEALTH EFFECTS

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I. INTRODUCTION

1. In 1984 and 1985 the class action claims of Vietnam veterans were settled for mere "nuisance value," and others were dismissed without being heard by a jury, due to the finding of a lack of evidence associating the veterans' cancers and other health effects with their exposures to the dioxin contained in the herbicide Agent Orange. The same court that approved these decisions now has under consideration in the above-captioned case the question whether the cases of veterans complaining of similar injuries, which did not arise until after 1984, should be allowed to be heard by a jury.

2. The purpose of this affidavit is to demonstrate that the conclusions regarding causality made in 1984 and 1985 were premature and scientifically invalid because they were based on inherently incomplete data. Numerous reports of scientific studies that did not exist at the time of the settlement in May 1984 now support the conclusion to a reasonable scientific certainty that exposure to dioxin is significantly associated with a wide range of health and reproductive effects in human beings.

3. This affidavit sets forth those studies showing a significant statistical association of dioxin with the health and reproductive effects suffered by Vietnam veterans, as well as data indicating the level of increased risk over background for Vietnam veterans and other populations. Many of these studies show that a subject group exposed to dioxin, including Vietnam veterans, suffered an additional number of adverse health effects and reproductive disorders which equal or exceed the number normally expected in a comparable population not exposed to dioxin. Such a doubling of the risk of fatality or injury caused by dioxin exposure is indicated below by the scientific notation of a "Standardized Mortality Ratio" (SMR), a "Standardized Rate Ratio" (SRR), a "Relative Risk", a "Proportionate Mortality Ratio" (PMR) or an "Odds Ratio" of 2 or higher.¹ (See Appendix B for epidemiological measures of the level of increased risk.) Such studies, in light of the aggregate of information from a variety of studies concerning the health effects of dioxin, provide convincing evidence that the observed health effects experienced by a given group was more likely than not to have been caused by dioxin. For veterans who were exposed to doses of dioxin comparable to those in other studied groups who are similar in relevant respects, it can be concluded on the basis of these studies that their injury was more likely than not caused by the known factor of exposure to dioxin, rather than any other factor which may underlie the normal expected incidence of such health effects.

4. For those epidemiologic investigations on the broad group of all

¹ This affidavit adopts the newer convention used by the U.S. Department of Veterans' Affairs (Thomas, T. L., and H. K. Kang (1990) *Am. J. Ind. Med.* 18: 665-673; Watanabe, K. K., H. K. Kang, and T. L. Thomas (1991) *J. Occup. Med.* 33:780-785) and others in reporting SMR, PMR, SRR values, as well as OR values, as unity (1.0) for no increased risk or incidence over the expected, two (2.0) for twice the risk or incidence, etc. In other words, multiplying the SMR or PMR ratio by 100, etc., is not done. This convention results in greater consistency between SMR, PMR, and OR values.

Vietnam veterans, without consideration for that subgroup with the highest probability of being significantly exposed to Agent Orange, in which less than a doubling of the background incidence of dioxin-related health effects was observed, it may be assumed that the actual level of risk actually was greater than a doubling of the background incidence for that subgroup of veterans having the highest probability of significant exposures. This is due to the dilution effect resulting from including Vietnam veterans in the study population who were not significantly exposed along with those who did experience significant exposures. Studies are presented below that demonstrate that a subgroup of Vietnam veterans most likely to have been exposed to Agent Orange (in addition to those who directly sprayed or handled herbicides) can be identified. The level of dioxin-related health effects experienced by this subgroup also has been determined to be much higher than that found in studies examining the total group of Vietnam veterans without regard for potential exposure.

5. Studies reported below show that the greatest increased relative risk of cancers due to dioxin exposure are detected in exposed groups only twenty (20) years or more after the exposure (latency period). Therefore, for Vietnam veterans whose exposures occurred after 1964, it would be premature to draw negative inferences of causation on the basis of the limited studies of veterans available in 1984, as the courts attempted to do in the previous Agent Orange litigation. For example, in 1984, a preliminary Air Force study was used as one basis for concluding there were no excess cancer risks among Vietnam veterans. This study evaluated cancer risks among pilots who conducted Agent Orange spray missions, where the majority conducted spray missions during 1968 and 1969. Since the preliminary Air Force study only evaluated the health status of these pilots as of 1982, the approximate latency period from exposure in Vietnam to 1982 only would have been fourteen to fifteen years, an insufficient period for cancers to develop. New Air Force studies on the same pilots' health status as of 1987, however, now show elevated rates of all cancers, as well as elevated skin cancer rates and other serious health effects, significantly associated with residual dioxin levels in the tissues of these pilots. Furthermore, the Office of Veterans' Affairs, the Centers for Disease Control, and independent researchers all have completed numerous new studies showing significantly elevated cancer rates and other serious health effects in other groups of Vietnam veterans.

6. It would be unscientific to reject, on the sole basis of findings from studies that existed up until 1984, the subsequent claims, now pending before the court, of veterans who assert that their injuries which arose only after 1984, were caused by dioxin. Complete and adequate evidence of causation from studies of Vietnam veterans could not have been expected to exist in 1984. It is simple scientific logic that epidemiologic data could not be complete until at least each complaining veteran's injury that arose within the known latency period has been counted. According to the studies reported below, the average latency period is 20 or more years for dioxin injury by cancer. The consequence of violating this logic was a finding of no evidence of causation in 1984, long before the end of the latency period, whereas in 1991 such evidence supporting a causal relationship between

dioxin and Vietnam veterans' injuries exists to a reasonable degree of scientific certainty. Evidence submitted below in support of this conclusion shows that it would have been scientifically invalid to rely solely on pre-1984 data to draw epidemiological conclusions about the causation of certain veterans' injuries that did not then exist.

7. With regard to reproductive abnormalities among male Vietnam veterans, inadequate evidence existed in 1984 for other reasons. Only one study became available in 1984 identifying reproductive abnormalities in families of male Vietnam veterans. There was no opportunity for the plaintiffs' medical and statistical experts to perform a critical analysis of this 1984 CDC study, however, although the study did represent some level of birth anomalies. Since 1984, numerous new studies using refined statistical methods have shown significantly elevated rates of birth defects and other reproductive abnormalities among Vietnam veterans and other dioxin-exposed populations, including two studies by the Air Force. Furthermore, numerous new studies are now available which show male-mediated reproductive abnormalities due to pre-conception paternal exposures to other toxic substances. The eventuality of male-mediated birth defects was denied as ever being demonstrated in any human population by the CDC in 1984.

8. Many Vietnam veterans have experienced more than one of the adverse health effects associated with dioxin. Such a coincidence of injuries increases the probability that the common causal factor for the multiple injuries was dioxin rather than two or more coincidental factors. In addition, a variety of human populations exposed to dioxin have experienced these health effects (Vietnam veterans, farmers, forestry workers, residential populations in Missouri and Italy, and chemical production workers in the U.S. and other countries), thus establishing a firm basis for concluding that dioxin, and not some other unique factor related to service in Vietnam, was responsible for these health effects. Furthermore, many Vietnam veterans as well as other populations exposed to dioxin have experienced dose-related increased rates of these adverse health effects, providing strong epidemiologic evidence that the effects were caused by, and not merely associated with, dioxin. In all cases, animals have experienced these same health effects when dioxin is administered in a controlled laboratory setting, thus providing a plausible biological basis for the health effects observed in humans.

9. The effects demonstrated by these new studies to be significantly associated with dioxin exposures include elevated cancers of all sites combined (representing a general carcinogenic effect of dioxin), as well as cancers of specific sites, namely: soft tissue sarcomas; non-Hodgkin's lymphoma; Hodgkin's disease; leukemias, lymphomas, and other hematologic cancers; respiratory system cancer; skin cancer; testicular cancer; and cancers of the brain, stomach, colon, rectum, prostate, hepatobiliary tract, pancreas, and kidney. One adverse effect in addition to cancer significantly associated with dioxin is organic nerve damage, including peripheral as well as central nervous system damage, and the

severe consequences of central nervous system damage, such as suicide and fatal accidents, depression, anxiety, and other neuropsychological problems. Other adverse effects significantly associated with dioxin include reproductive abnormalities; immunological abnormalities; dermatologic abnormalities; hepatotoxic effects; gastrointestinal ulcer; cardiovascular disorders; metabolic disorders such as porphyria cutanea tarda, thyroid dysfunction, diabetes, and altered lipid metabolism; and lung and thorax abnormalities.

10. Data contained in some recent studies do not always support a statistically significant association between dioxin and these adverse health effects. The reasons for a lack of such an association may be poor classification of the exposed population (for example, including Vietnam veterans who did not have significant exposures), or other variations in the population under study. The preponderance of the evidence from all recent studies, however, supports the conclusion that dioxin is significantly associated with these health effects. (See Appendix B for definitions of terms relating to statistical significance.)

11. In addition, evidence is provided that earlier studies conducted by the defendant Agent Orange producing companies are invalid, being reversed by a 1991 study by the National Institute of Occupational Safety and Health (NIOSH) which re-examined the same chemical production worker population. These studies were relied upon by the defendant companies in earlier litigation brought by Vietnam veterans to deny any long term effects by dioxin. These industry studies are currently the subject of an active criminal investigation for fraud by the National Enforcement Investigations Center, U.S. Environmental Protection Agency (EPA).

12. The undersigned affiant has the following experience in assessing scientific studies as they pertain to toxicological effects on humans and managing environmental sampling and analysis studies to determine potential hazards from toxic substances: I am employed by the EPA, in the Characterization and Assessment Division of the Office of Solid Waste. As Project Manager for new hazardous waste listings under the Resource Conservation and Recovery Act (RCRA), my duties include designing waste sampling and analysis strategies, as well as managing the development of the toxicological basis to support new listings by either the Agency's Office of Research and Development or with contractor support. From 1980 to 1987, I was responsible for the new pentachlorophenol wood treating plant regulations, which involved characterizing the hazards of a range of chlorinated dioxins and furans in wastes from this industrial process. During this time, I served on the EPA Work Group for the validation of new analytical methods to characterize dioxin and furan compounds, as well as managed the development of health effects information for dioxins and other toxic con-

stituents.²

13. I hold a doctorate in chemistry from the Polytechnic Institute of New York. After receiving my degree, I was co-founder of the Arts Hazard Project, Center for Occupational Hazards, Inc. in New York City, a not-for-profit research and educational institution. I was funded directly by a National Science Foundation Public Service Science Residency, and my organization as a whole was funded by the National Endowment for the Arts and the New York State Council on the Arts. As Information Center Director, I compiled health and safety information on materials used by both professional artists and the school system, conducted site inspections to advise on proper studio design and practices to control toxic hazards, and assisted the National Institute for Occupational Safety and Health in its program to characterize toxic dyestuffs used by artists and craftspersons.

14. After working with the Arts Hazard Project, and prior to coming to the EPA, I received funding from an Occupational Safety and Health Administration Traineeship, and was assigned to the International Chemical Workers' Union in Akron, Ohio. As an occupational health specialist, I assisted local unions in characterizing toxic hazards in the workplace, assisted in negotiations to alleviate hazards, and prepared the technical basis to support workmen's compensation cases.

² The preparation of this affidavit was on the affiant's volition, responding to her required duties to provide assistance to the public. The conclusions regarding the new studies on dioxin do not necessarily represent those of the EPA.

II. DISEASES SIGNIFICANTLY ASSOCIATED WITH AGENT ORANGE AND DIOXIN

1. CANCERS

15. The following summarizes the recent (after 1984) evidence showing statistically significant associations between exposure to dioxin and the development of elevated cancer rates in humans. Dose-response relationships have also demonstrated in these studies. A demonstration that the rate of excess cancers is higher for higher past exposures (dose-related) provides strong epidemiologic evidence that dioxin causes, and is not just significantly associated with, cancers. In addition, recent studies are summarized which demonstrate that humans are as sensitive to the carcinogenic effects of dioxin as previously observed in laboratory animals.

1.1. Cancer of All Sites Combined

16. Dioxin has been demonstrated to exert a general carcinogenic effect in several recent major studies. The National Institute of Occupational Safety and Health (NIOSH) interpreted the findings in their study showing an elevation of cancers in all organ sites as being consistent with dioxin being a general carcinogen. In other words, dioxin does not discriminate between organ systems in producing excess cancer rates. This wide range of cancers in non-specific organ systems has also been observed in animal studies, such as one conducted by Dow Chemical Corporation.³

National Institute of Occupational Safety and Health Study of U.S. 2,4,5-Trichlorophenol Production Workers

17. On January 24, 1991, the National Institute for Occupational Safety and Health (NIOSH) released a study of the health of 5,172 workers at 12 chemical plants that manufacture products contaminated by dioxin.⁴ The NIOSH found a significant increase in mortality due to all cancers combined for the entire study group of exposed workers (SMR⁵ = 1.15; 95% confidence interval [C.I.] = 1.02 - 1.30;

³ Kociba, R. J., D. J. Keyes, D. E. Beyer, *et al.* (1978) Results of a two year chronic toxicity and oncogenicity study of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) in rats. *App. Pharmacol.* **46**: 279-303.

⁴ Fingerhut, M. A., Halperin, W. E., Marlow, B. S. *et al.* (1991) Cancer mortality in workers exposed to 2,3,7,8-tetrachlorodibenzo-*p*-dioxin. *New Engl. J. of Med.* **324**: 212-218. *More complete version of study*: Fingerhut, M. A., Halperin, W. E., Marlow, B. S. *et al.* (1991) Mortality among U.S. workers employed in the production of chemicals contaminated with 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD). Industry wide Studies Branch, Division of Surveillance, Hazard Evaluation and Field Studies, NIOSH, Cincinnati, Ohio 45226. Available from the National Technical Information Service, NTIS # PB 91-125971, 5285 Port Royal Rd., Springfield, VA 22161, (800) 525-NTIS.

⁵ This affidavit adopts the newer convention used by the U.S. Department of Veterans' Affairs (Thomas, T. L., and H. K. Kang (1990) *Am. J. Ind. Med.* **18**: 665-673; Watanabe, K. K., H. K. Kang, and T. L. Thomas (1991) *J. Occup. Med.* **33**:780-785) and others in reporting SMR, PMR,

$p < 0.05$), as well as significantly higher excess mortality in the subgroup of workers having greater than 1 year of exposure and 20 years latency (SMR = 1.46; 95% C.I. = 1.21 - 1.76; $p < 0.05$).

German BASF 2,4,5-T Production Workers

18. In 1989, the Badische Anilin and Soda-Fabrik (BASF) re-examined the causes of death among 247 of its workers exposed to dioxin as the result of a 2,4,5-T explosion at the plant in Ludwigshafen, Germany in 1953.⁶ A statistically significant increased standardized mortality ratio (SMR) was found for cancers of all sites for those workers who developed chloracne with 20 or more years of latency from first exposure to dioxin (SMR = 2.01; 90% C.I. = 1.22 - 3.15; $p = 0.01$ (one sided)). This elevated rate was principally due to a borderline excess of death from lung cancer (SMR = 2.52; 90% C.I. = 0.99 - 5.30).

19. When a combined group of workers was evaluated (those exposed to the 1953 accident and workers employed between 1954 and the late 1960s involved in demolishing the plant and other clean-up operations) the SMR for cancers at all sites combined approached statistical significance (SMR = 1.71; 90% C.I. = 0.96 - 2.83). This association was even stronger if a period of 20 or more years had elapsed (latency period) from the first exposure to dioxin (SMR = 2.38; 90% C.I. = 1.18 - 4.29).

Boehringer Company Chlorophenol Production Workers

20. In 1990, preliminary results demonstrated elevated cancer mortality in workers exposed to dioxin in 2,4,5-T production at the Boehringer Ingelheim Company, in Hamburg, Germany.⁷ The group assumed to be exposed consisted of 1525 persons (1146 men, 379 women), all persons who had worked at the company for at least 3 months since 1952, and who died between 1962 and 1989. A control group consisted of 3417 other workers presumed not exposed to dioxin. Mortality for total cancer was elevated for the males in the Boehringer cohort. For males who entered the plant before 1954 or earlier, the rate of all cancers was elevated (SMR = 1.95; 95% C.I. = 1.43 - 2.66). For the group with longest duration of employment (20 years or more) the SMR was 1.92 (95% C.I. = 1.02 - 3.27). The cancers observed included 5 cases of non-Hodgkin's lymphoma, 2 reticulosarco-

SRR values, as well as OR values, as unity (1.0) for no increased risk or incidence over the expected, two (2.0) for twice the risk or incidence, etc. In other words, multiplying the SMR or PMR ratio by 100, etc., is not done. This convention results in greater consistency between SMR, PMR, and OR values.

⁶ Zober, A., P. Messerer, and P. Huber (1989) Thirty-four-year mortality follow-up of BASF employees exposed to 2,3,7,8-TCDD after the 1953 accident. *Occup. Environ. Health* 62: 139-157.

⁷ Manz, A., J. Borger, D. Flesch-Janys, et al. (1990) Cancer mortality in workers of the Hamburg-Moorfleet plant of the Boehringer Ingelheim Company. A retrospective cohort study. Methodology and preliminary results. Paper presented at conference: *Dioxin '90*, Bayreuth, Germany, September, 1990.

mas, 1 lymphosarcoma, and 2 chronic lymphatic leukemias.

Air Force Ranch Hand Health Study

21. In 1990, the Air Force published the results of a follow-up health study comparing approximately 995 Vietnam veterans who served as pilots in Agent Orange spraying missions in Vietnam with 1,299 other veterans who served in air cargo (non-spraying) missions in Southeast Asia during the same period.⁸ For verified cancers of all sites combined, excluding skin cancers, there was an elevated risk for Ranch Hand veterans (relative risk = 1.31; 95% C.I. = 0.71 - 2.42; $p = 0.472$). The elevated risk for both verified cancers of all sites combined, including skin, was statistically significant (relative risk = 1.26; 95% C.I. = 1.03 - 1.54)

22. The Air Force noted that this study had poor statistical power. The study was incapable of detecting any excess cancers risks other than for common cancers (those with background incidence levels of at least 5 percent in the unexposed control group). The Air Force noted that as a result, the study was limited in its ability to specifically detect excess occurrences of rare cancers such as soft tissue sarcomas and non-Hodgkin's lymphomas. The results of this Air Force study are also preliminary, since most of the Operation Ranch Hand veterans conducted spray missions in 1968 and 1969. The 1990 Air Force study only evaluated the health status of these veterans during 1987 and the first three months in 1988. Thus the approximate latency period from exposure in Vietnam for most of these veterans has only been 18 to 20 years. Numerous other studies of dioxin exposed populations indicate that the average latency period is more than 20 years, with some studies indicating that there is no diminishment of the carcinogenic effects of dioxin after 20 years.

23. As discussed in later sections, the additional health effects found in this and other Air Force studies on the veterans of Operation Ranch Hand include excess skin cancers and other dermatologic abnormalities, elevated lung cancer rates and lung and thorax abnormalities, excess kidney and bladder cancer, nervous system damage, testicular atrophy and decreased testosterone levels, diabetes, decreased thyroid function, abnormal peripheral vascular function, immune system abnormalities, and reproductive abnormalities.

Veterans' Affairs Proportionate Mortality Study

24. In July 1991, the Department of Veterans' Affairs (VA) published a proportionate mortality study which compared the causes of death in 5501 Marine

⁸ Thomas, W. F., W. D. Grubbs, T. G. Karrison, *et al.* (February, 1990) Air Force Health Study. An epidemiological investigation of health effects in Air Force personnel following exposure to herbicides, *1987 Follow-up Examination Results (May 1987 to January 1990)* Air Force Report No. USAFSAM-TR-90-1, available from Epidemiology Division, USAF School of Aerospace Medicine,

— footnote continued

Vietnam veterans to 4505 Marine non-Vietnam veterans.⁹ Marine Vietnam veterans had significant excess cancer deaths of all sites (PMR = 1.15; 95% C.I. = 1.06 - 1.24). These excess cancers of all sites also included statistically significant excesses of non-Hodgkin's lymphoma and Hodgkin's disease, discussed in later sections. Army Vietnam veterans were not found to have statistically significant excesses of cancer in all sites in this study. Following sections discuss the excess rates of non-Hodgkin's lymphoma, Hodgkin's disease, and lung cancer in these Vietnam veterans.

Australian Veterans Health Service Study

25. The Australian Veterans Health Services published a mortality study comparing 19,205 Australian Vietnam veterans with 25,677 non-Vietnam veterans who served only in Australia.¹⁰ For the period from 1983 to 1985, death rates from all cancers was elevated (odds ratio = 1.1; 95% C.I. = 0.7 - 1.7), although this elevation failed to reach statistical significance.

Seveso Italy Residents Exposed to 2,4,5-Trichlorophenol Plant Explosion

26. In 1989, findings became available evaluating the causes of death in the surrounding population ten years after a 1976 explosion of a 2,4,5-trichlorophenol plant near Seveso, Italy.¹¹ This study was funded by the Government of the Region of Lombardy and the Italian National Research Council. The most heavily contaminated area (Zone A) was adjacent to the plant, with Zone B being one outer contamination zone. Zone R was further downwind. Zone R was previously thought to have been relatively uncontaminated, but recent data suggests more heavy involvement.¹² Residents currently or formerly living in Zones A, B, and R between 1976 and 1986 were traced using over 4,300 local city death certificate registries to determine current vital status.

27. Males in Zone B were found to have significantly higher rates of all cancers combined in the 5 - 10 year period after the accident (relative risk = 1.48; 95% C.I. = 1.0 - 3.3). The authors noted that since only 10 years had elapsed since the explosion, many cancers still would not have had a sufficient latency period for the development of cancer (elapsed time from exposure).

Human Systems Division (AFSC), Brooks Air Force Base, Texas 78235, page 10-49, 57.

⁹ Wantabe, K. K., H. K. Kang, and T. L. Thomas (1991) Mortality among Vietnam veterans: With methodological considerations. *J. Occup. Med.* 33: 780-785.

¹⁰ Fett, M. J., J. R. Nairn, D. M. Cobbin, and M. A. Adena (1987) Mortality among Australian conscripts of the Vietnam conflict era. II. Causes of Death. *Am. J. Epidemiol.* 125: 878-884.

¹¹ Bertazzi, P. A., C. Zocchetti, A. C. Pesatori, et al. (1989) Ten-year mortality study of the population involved in the Seveso Incident in 1976. *Am. J. Epidemiol.* 129: 1187-1200.

¹² Caramaschi, F., G. Sel Corno, C. Favaretti, et al. (1981) Chloracne following environmental contamination by TCDD in Seveso, Italy, *Int. J. Epidemiology*, 10: 135-143.

Study of Maine Paper Mill Workers by NIOSH

28. In June 1991 NIOSH presented findings from a case-control mortality study of paper mill workers in Maine.¹³ NIOSH identified 299 deaths from malignant neoplasms (cases) between 1973 and 1982 in the Maine community. Controls were persons in the community dying of other causes during this period. Odds ratios were significantly elevated for cancers of all sites combined for persons who had worked for one or more years at the plant (odds ratio = 1.37; 95% C.I. = 1.00 - 1.87). The odds ratio for dying of any type of cancer also increased in a statistically significant manner with increasing duration of employment at the paper mill, thus establishing a dose-response relationship between work at the mill and increased cancer of all sites. Pulp and paper mills are known sources of dioxin contamination, due to the use of reactive chlorine compounds for bleaching.

¹³ Galson, S., R. Rinsky, S. Burt, J. Lipscomb (June, 1991) Cancer mortality in paper mill workers. Abstract, presented at the meeting of the *Society for Epidemiologic Research*, NIOSH, Cincinnati, OH 45226.

1.2. Soft Tissue Sarcomas

29. Soft tissue sarcomas include a wide range of cancers arising from tissue of mesenchymal origin (primordial embryonic tissue), including smooth and striated muscle, fat, blood or lymph vessels, synovial structures (cavities between the joints), or fibrous and adipose connective tissue. The Department of Veterans' Affairs now recognizes the significant statistical association between dioxin exposure and excess risks for soft tissue sarcoma, by its February 25, 1991 proposal to amend its regulations "for the establishment of service connection for soft-tissue sarcomas based on exposure to herbicides containing dioxin."¹⁴

Massachusetts Vietnam Veteran Study

30. In 1988, the Massachusetts Department of Public Health published a mortality study of Massachusetts Vietnam veterans.¹⁵ Death certificates were used to identify causes of death between 1972 to 1983. Statistically significant excess deaths were found from soft tissue sarcomas. Compared to non-Vietnam veterans who served during the same period, the risk for soft tissue sarcomas among Vietnam veterans was elevated over five times expected (standardized mortality odds ratio [sMOR] = 5.16; 95% C.I. = 2.39 - 11.14). The sMOR for soft tissue sarcoma for Vietnam veterans compared to non-veteran males was 5.87 (95% C.I. = 2.92 - 11.78).

31. The Massachusetts Department of Public Health extended its analysis of Vietnam veterans into the period 1982 to 1988.¹⁶ The adjusted odds ratio for soft tissue sarcoma among Vietnam veterans, compared to non-Vietnam veterans, was 3.08 (95% C.I. = 1.07 - 8.73), demonstrating over a three-fold excess risk.

Veterans' Affairs Study of Soft Tissue Sarcoma and Military Service in Vietnam

32. In 1987, the VA evaluated the association of soft tissue sarcomas with military service in Vietnam.¹⁷ This case-control study demonstrated that subgroups of ground troops who had higher estimated opportunities for Agent Orange exposure, experienced a greater risk of developing soft tissue sarcomas. The risk of soft tissue sarcomas was even greater (odds ratio = 8.64; 95% C.I. = 0.77 - 111.84) when the location of their units was within military region III, an area where Agent Orange was reportedly extensively sprayed. The Army Vietnam veterans with a combat-related classification showed a 2.6 times elevated

¹⁴ Department of Veterans Affairs (February 25, 1991) Claims based on exposure to herbicides containing dioxin (soft-tissue sarcoma). *Federal Register* 56: 7632-7634.

¹⁵ Kogan, M. D., and R. W. Clapp (1988) Soft tissue sarcoma mortality among Vietnam veterans in Massachusetts, 1972 to 1983. *Int. J. Epidemiol.* 17: 39-43.

¹⁶ Clapp, R. W., L. A. Cupples, T. Colton, and D. M. Ozonoff (1991) Cancer Surveillance of veterans in Massachusetts, USA, 1982-1988. *Int. J. Epidemiol.* 20: 7.

¹⁷ Kang, H., Enzinger, F., Breslin, P., et. al. (1987) Soft tissue sarcoma and military service in Vietnam: A case-control study, *J. Natl. Cancer Inst.* 79: 693-699.

risk for soft tissue sarcomas (odds ratio = 2.57; 95% C.I. = 0.72 - 9.36), although this failed to reach statistical significance.

West Virginia Vietnam Veteran Mortality Study

33. In 1986, the West Virginia Department of Health completed a study characterizing the causes of death among 41,059 Vietnam veterans between 1968 and 1983.¹⁸ Vietnam veterans experienced significantly elevated (over four times expected) excess deaths from soft tissue sarcomas compared to non-veterans (standardized proportionate mortality ratio [sPMR] = 4.29; 95% C.I. = 0.90 - 12.71; $p < 0.05$). In addition to soft tissue sarcomas, the West Virginia veterans' study also found other elevated cancers (Hodgkin's disease, cancer of the lymphatic tissue, larynx, and testes) as well as elevated deaths from accidents and other violence (see other sections).

34. Note that this West Virginia study had more power to detect cancer excesses than several studies by the Centers for Disease Control (CDC), the VA, and Air Force. This is because the total population of Vietnam veterans under study by West Virginia was 41,059, whereas the CDC only included 9,324 Vietnam veterans in one of its study groups,¹⁹ with similar low study group numbers in the other U.S. government studies. As a result, the West Virginia study found statistically significant excess deaths from soft tissue sarcomas (discussed this section) as well as the excess cancers discussed in other sections (Hodgkin's disease, cancers of lymphatic tissue, testicular cancer, and cancer of the larynx).

Wisconsin Department of Health Vietnam Veteran Study

35. In 1986, the Wisconsin Department of Health and Social Services released findings on the 974 Wisconsin Vietnam veterans who died from 1960 to 1979 (excluding deaths during service in Vietnam).²⁰ Vietnam veteran deaths from soft tissue sarcomas were proportionately higher (PMR = 15.30, $p < 0.05$) than causes of death in other Wisconsin veterans (both those who served in the Vietnam era but not in Vietnam, as well as veterans of other periods). Deaths from soft tissue sarcomas were also proportionally higher compared to veterans of the same era who did not serve in Vietnam, although this elevation did not reach statistical significance, due in part to the fact that Vietnam era veterans also experienced proportionally higher soft tissue sarcoma deaths compared to veterans

¹⁸ Holmes, A. P., C. Bailey, R. C. Baron, *et al.* (1986) West Virginia Vietnam-Era Veterans Mortality Study. Available from West Virginia Dept. of Health, 1800 Washington St., East, Charleston, WV 25305.

¹⁹ Centers for Disease Control (1987) Postservice mortality among Vietnam veterans. *J. Am. Med. Assoc.* 257: 780-795.

of other eras.

National Institute of Occupational Safety and Health Study of U.S. 2,4,5-Trichlorophenol Production Workers

36. The January 24, 1991 NIOSH study of 12 U.S. chlorophenol and herbicide manufacturing plants (see above section on cancers at all sites combined) found that mortality from soft-tissue sarcomas was increased significantly in the subcohort of 1520 workers who had 1 year or more of exposure and at least 20 years elapsed time since first exposure (latency period) (SMR = 9.22; 95% C.I. = 1.90 - 26.95; $p < 0.05$).²¹ Mortality from soft tissue sarcomas was near statistical significance for all exposed workers (SMR = 3.38; 95% C.I. = 0.92 - 8.65; $p < 0.05$).

Dow Chemical Corporation Studies of Chlorophenol Production Workers

37. In 1989, Dow Chemical Corporation performed an evaluation of two groups of employees who had been employed at some period between 1937 to 1980, who had been exposed to tetrachlorodibenzo-*p*-dioxin and/or higher chlorinated dioxins (hexa- through octachlorinated isomers).²² Dow examined both the total group of 2192 exposed workers as well as a subgroup of 323. The subgroup had been diagnosed as having either definite or probable chloracne at some period. Dow found that for this subgroup of 323 workers, compared to the general U.S. male population, there were statistically significant excess risks for connective and other soft tissue cancer.

International Agency for Research on Cancer (IARC) Combined European Cohort Study

38. The International Agency for Research on Cancer (IARC) is using a combined European cohort of 2,4,5-T and chlorophenol production workers to determine the effects of dioxins on humans.²³ Preliminary results, as reported in the New England Journal of Medicine by researchers indicate an increased risk

²⁰ Anderson, H. A., L. P. Hanrahan, M. Jensen, *et al.* (1986) Wisconsin Vietnam veteran mortality study - Proportionate mortality ratio results. Standardized mortality ratio results - Final report. State of Wisconsin Dept. of Health and Social Services, P.O. Box 309, Madison, WI 53701.

²¹ Op. cit., Fingerhut, M. A., Halperin, W. E., Marlow, B. S. *et al.* (1991).

²² Bond, G. G., E. A. McLaren, T. E. Lipps, and R. R. Cook (1989) Update of mortality among chemical workers with potential exposure to higher chlorinated dioxins. *J. Occup. Med.* 31: 121-123.

²³ Kogevinas, M., R. Saracci, and R. A. Bertazzi, *et al.*, (1990) The IARC international register of persons exposed to phenoxy herbicides and contaminants. Presented at the 23rd International Congress of Occupational health, Montreal, Canada, September 27, 1990.

of soft tissue sarcomas, dependent on the elapsed time from exposure (latency).²⁴

Combined Swedish Study

39. In 1991, researchers at both the Linköping and Umeå University Hospitals aggregated data from four similarly designed case control studies associating past dioxin exposures with excess cancers.²⁵ The same criteria was used for duration of exposure and latency as used by the NIOSH in its January 24, 1991 study²⁶ of chemical production workers (see discussions above). For 352 soft tissue sarcoma cases where subjects had prior exposure to dioxin, a statistically significant dose-response relationship was found; the degree of risk increasing for longer periods of past dioxin exposure. For exposures of less than one year, the risk was three times expected (odds ratio = 3.0; 90% C.I. = 2.0 - 6.5; $p < 0.01$). Dioxin exposures of greater than one year, the odds ratio for elevated soft tissue sarcomas increased to 7.2 (95% C.I. = 2.6 - 20; $p < 0.01$).

Swedish Uppsala Region Study

40. In a study published in 1990, 237 male patients diagnosed with soft tissue sarcomas between 1978 and 1986 from the Regional Cancer Registry in Uppsala, Sweden were evaluated.²⁷ This case-control study was funded by the Swedish Cancer Society and the Swedish Work Environment. Previous jobs and exposures to different agents, including pesticides, were assessed. Exposure to phenoxyacetic acids or chlorophenols was found to be associated with a statistically significant increased relative risk of 1.80 for soft tissue sarcomas (95% C.I. = 1.02 - 3.18). Past exposures to the herbicide 2,4,5-T were associated with a relative risk of 1.81 (95% C.I. = 0.85 - 3.87). First exposures to 2,4,5-T during the 1950s were significantly associated with almost a threefold increased risk (relative risk = 2.94; 95% C.I. = 1.08 - 7.98). High-grade exposures to chlorophenols, which are also contaminated by dioxins, were associated with a statistically significant relative risk of 5.25 for soft tissue sarcomas (95% C.I. = 1.69 - 16.34).

41. Hemangiosarcomas (type of soft tissue sarcoma) were also among the tumor types associated with pentachlorophenol exposures. The increased risks for these cancers was attributed to dioxin-contaminated phenoxyacetic acids or chlorophenols. Commenting on their 1990 study, Dr. Lennart Hardell, MD, Ph.D., and Mikael Eriksson, MD stated that the increased risk for soft tissue sarcomas was clearly shown to be attributable to dioxin-contaminated phenoxyacetic

²⁴ Hardell, L, M. Eriksson, Massachusetts, and M. Fredriksson (1991) *N. Engl. J. Med.* 324: 1810.

²⁵ Op. cit., Hardell, L, M. Eriksson, O. Axelsson, and M. Fredriksson (1991).

²⁶ Op. cit., Fingerhut, M. A., W. E. Halperin, D. A. Marlow, *et al.* (1991).

²⁷ Eriksson, M., Hardell, L., Adami, H.O. (1990) Exposure to dioxins as a risk factor for soft tissue sarcoma: A population based case control study. *J. Natl. Cancer Inst.* 82:486-490.