# Appendix E
# Additional Incident Database Information

## E.1 Discussion of Incidences Associated with Chlorothalonil

As discussed in Section 4 of the risk assessment, a number of incidents have been reported in which chlorothalonil has been associated with some type of environmental effect. The incidences were divided into three categories:

1. Incidences in which chlorothalonil concentrations were confirmed to be sufficient to either cause or contribute to the incident;
2. Incidences in which insufficient information is available to conclude whether chlorothalonil may have been a primary contributing factor in the incident – these may include incidents where there was a correlation between chlorothalonil use and an incident, but the presence of chlorothalonil was not confirmed; and
3. Aquatic incidences in which causes other than chlorothalonil exposure are more plausible (e.g., presence of substance other than chlorothalonil confirmed at toxic levels).

A total of 32 incidences are included in the EIIS database. The presence of chlorothalonil at levels thought to be sufficient to cause either direct or indirect effects was confirmed in 3 of the 32 incidents. Chlorothalonil use was also correlated with another 24 incidents where its application was correlated with the incident, but a causal relationship between chlorothalonil use and the incident could not be established. An additional 5 incidents were reported in which some factor other than chlorothalonil were likely the primary cause of the incident. Environmental incidences evaluated for this assessment are summarized below in Tables E-1 to E-3.

**Table E-1. Incidences in which chlorothalonil is likely the primary cause of the incident.**

| Incident No. | Date | Species | Certainty Discussion | Certainty Index Assigned to Incident in EIIS | Incident description |
|---|---|---|---|---|---|
| I01198-008 | 7/19/2001 | Fish, Heron, Turtle | Incident attributed to both mefenoxam and chlorothalonil. | Highly Probable | Syngenta reported an incident in McMurray, PA, that resulted in the death of many fish and turtles along a ½ mile stretch of a stream that feeds into a river. A dead heron was also found. The cause of the incident was attributed to the overturning of a portable tank containing SUBDUE and MANICURE 6 FLOWABLE on a golf course, and the subsequent spill of 20 gallons of diluted material on the ground adjacent to the stream. |
| I007372-007 | 7/26/1997 | Unknown fish | Accidental spill. Fish tissues were not analyzed for chlorothalonil. | Probable | Fish kill was attributed to accidental spill of Ensign 720. |
| I003377-013 | 12/3/1993 | Spinach | Incident was attributed to misuse of Ridomil/Bravo 81W on broccoli. | Highly Probable | Incident resulted in damage to approximately 15 acres of spinach and 20 acres of lettuce. |

**Table E-2. Incidences in which insufficient information is available to conclude whether or not chlorothalonil was likely a contributing factor.**

| Incident No. | Date | Species | Certainty Discussion | Certainty Index Assigned to Incident in EIIS | Incident description |
|---|---|---|---|---|---|
| I000636-014 | 4/19/1984 | Unknown fish | Daconil was one of four products used on the golf course but no analytical data were provided. | Possible | Fish kill occurred at a golf course. Two days before the kill the golf course was sprayed with dacthal, daconil, Tersan, and Actidione. No analyses of fish or water were included in the report. |
| B0000-500-15 | 5/26/1989 | Trout Crappie | Chlorothalonil levels were lower than the LOD, and endosulfan was present at levels approaching its the LC50. | Possible | -- |
| I014538-013 | 8/1/2003 | Unknown fish | 1500 fish died after an employee of a country club golf course released rinsate of propoconizole, chlorothalonil, and trichlorfon into a creek. No analysis of the fish was given. | Possible | Rinsate was from clean up of Daconil, Banner, and Dylox. |
| I012265-006 | 7/20/1996 | Salmon Trout | Chlorothalonil was implicated in the incident because it was the only pesticide detected that had been among those used in the area. Chlorothalonil levels were 4 ppb at the time of sampling. However, the symptoms reportedly normally present in fish that have been killed by chlorothalonil were not present in the affected fish. It is possible than another pesticide (i.e. endosulfan) caused this incident and then rapidly degraded. | Possible | Approximately 40,000 salmon and a large number of trout were killed beginning 7/20/1996 at Profit's Pond, Prince Edward Island, Canada. A canvas of farmers in the area indicated that the following pesticides had been applied at some time before the incident took place: carbofuran, chlorothaloniul, endosulfan I & II, cypermethrin, Admire, Guthion, metalaxyl, gamma-cyhalothrin, and mancozeb/metiram. However, acutely toxic concentrations of chlorothalonil cause a bronzing of the skin and reddening of the fin bases, and the fish kill in Profit's Pond did not show that symptom. Endosulfan was also implicated in the incident; however, presence of endosulfan in fish tissues was not confirmed. |
| I002200-001 | 8/7/1994 | Brook Trout | Maneb, Chlorothalonil, Esfenvalerate were applied 5 days prior to a large rainfall event. Each of the pesticides were detected in fish samples. | Possible | Approximately 10,000 fish that were newly released from a hatchery were found dead. Recent pesticide applications occurred 5 days prior to the event (maneb, esfenvalerate, chlorothalonil). The following day there were severe rains. Three samples of water were taken from the brook and the pond; a soil sample was taken from the bank of the brook. Three fish tissues were assayed for each of the pesticides. According to the report, because of other environmental variables, there was insufficient data to implicate these pesticides as sole causative agent in the fish kill; however, each of the pesticides were detected in fish tissue samples. |
| I013884-010 | 6/26/1998 | Bee | Three chemicals were implicated in the incident that were detected in bee tissues: Chlorothalonil, Carbrfuran, and Methamidophos | Highly probable | Chlorothalonil is practically non-toxic to honey bees; carbofuran and methamidophos are considerably more toxic to honey bees than chlorothalonil. |
| I013587-012 | 4/14/1999 | Bee | Chemicals implicated in the incident that were detected in bee tissues included Dimethoate, Carbaryl, Chlorothalonil, and Methamidophos | Possible | 150 Bee colonies were affected. Also, the incident report suggests that carbaryl misuse may have contributed to the incident. Chlorothalonil is practically non-toxic to honey bees. |
| I014341-034 | 1999 | Bee | Chemicals implicated in the incident that were detected in bee tissues included Chlorothalonil, Carbrfuran, and | Possible | Report provides minimal data to make a judgment regarding causality. The report only gives the year of the incident not the month. Kill magnitude was unknown. |

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| | | | Methamidophos | | |
| I014341-033 | 1999 | Bee | Chemicals implicated in the incident that were detected in bee tissues included Chlorothalonil, Carbrfuran, and Methamidophos | Possible | Report provides minimal data to make a judgment regarding causality. The report only gives the year of the incident not the month. Kill magnitude was unknown. |
| I009262-115 | 8/19/1999 | Evergreen trees | Pictures of shrubs had been received but no judgment had been made regarding their significance | Possible | Resident of O'Fallon MO reported that Daconil 2787 killed 6 trees. |
| I007340-686 | 5/21/ 1998 | Ornamental shrubs | To comply with 6(a)2 regulations, Solaris reported that ornamentals were alleged to have been damaged in WV as the result of using Chlorothalonil. | Possible | To comply with 6(a)2 regulations, Solaris reported that ornamentals were alleged to have been damaged in WV as the result of using Chlorothalonil. |
| I014597-011 | 4/1/ 1998 | Conifers | Conifers treated directly. The incident report concluded that it is possible that chlorothalonil caused the damage. | Possible | To comply with 6(a)2 requirements, Syngenta reported an incident which was alleged to have been caused by Bravo. Symptoms were miscellaneous. |
| I014597-010 | 5/1/ 1998 | Conifers | Conifers treated directly. The incident report concluded that it is possible that chlorothalonil caused the damage. | Possible | To comply with 6(a)2 requirements, Syngenta reported an incident in which 10 acres of conifers were damaged by Bravo Weatherstik. Symptoms cited were "discolored, bleached." |
| I007340-625 | 4/29/1998 | Lawn | The report concluded that it is possible that chlorothalonil damaged the treated lawn. | Possible | To comply with 6(a)2 regulations, Solaris reported that a lawn was damaged in Ohio on 4/29/1998 (Case#17212). The product that had been used was Ortho Lawn Disease. |
| I007340-628 | 4/30/1998 | Lawn | The report concluded that it is possible that chlorothalonil damaged the treated lawn. | Possible | To comply with 6(a)2 regulations, Solaris reported that a lawn was alleged to be damaged by Ortho Lawn Disease in CA on 4/30/1998 (Case#18363). |
| I007340-629 | 4/30/1998 | Lawn | The report concluded that it is possible that chlorothalonil damaged the treated lawn. | Possible | To comply with 6(a)2 regulations, Solaris reported that a lawn was alleged to be damaged by chlorothalonil in CA on 4/30/1998 (Case#18364). |
| I007340-630 | 4/30/1998 | Lawn | The report concluded that it is possible that chlorothalonil damaged the treated lawn. | Possible | To comply with 6(a)2 regulations, Solaris reported that a lawn was alleged to be damaged by chlorothalonil in CA on 4/30/1998 (Case#18377). |
| I007340-631 | 4/30/1998 | Lawn | The report concluded that it is possible that chlorothalonil damaged the treated lawn. | Possible | To comply with 6(a)2 regulations, Solaris reported that a lawn was alleged to be damaged by chlorothalonil in CA on 4/30/1998 (Case#18387). |
| I007340-632 | 4/30/1998 | Lawn | The report concluded that it is possible that chlorothalonil damaged the treated lawn. | Possible | To comply with 6(a)2 regulations, Solaris reported that a lawn was alleged to be damaged by chlorothalonil in CA on 4/30/1998 (Case#18392). |
| I007340-638 | 5/4/1998 | Lawn | The report concluded that it is possible that chlorothalonil damaged the treated lawn. | Possible | To comply with 6(a)2 regulations, Solaris reported that a lawn in North Carolina was alleged to have been damaged on 5/4/1998 by chlorothalonil(Case#19482). |
| I007340-712 | 5/28/1998 | Lawn | The report concluded that it is possible that chlorothalonil damaged the treated lawn. | Possible | To comply with 6(a)2 regulations, Solaris reported that a lawn was alleged to have been damaged in Virginia on 5/28/1998, as the result of using chlorothalonil |
| I007340-693 | 5/22/1998 | Ornamentals | The report concluded that it is possible that chlorothalonil damaged the treated ornamentals. | Possible | To comply with 6(a)2 regulations, Solaris reported that ornamentals were alleged to have been damaged in California on 5/22/1998, as the result of using chlorothalonil. (Case#32933) |
| I014406-002 | 6/15/1996 | Onions | It is alleged that the aerial application of these four pesticides damaged an onion field. Report did not state where the pesticides were applied. | Possible | This was reported in the 1996 Annual Report of Pesticide Incident Reporting and Tracking Review Panel by the Washington State Department of Health. It was alleged that an onion field was damaged by aerial application od Diazinon, metalaxyl, mancozeb and chlorothalonil. |
| I011942-002 | 6/2/2001 | Peanut | Other pesticides were applied at the | Possible | To comply with 6(a)2 regulations, Valent |

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| | | | same time as chlorothalonil, and any or all of them could have contributed to the incident. | | reported a complaint from Girade, GA, that VALOR damaged an entire peanut crop. There were two sites, one of 26 acres and another of unspecified area. Other products used at the time of application were Prowl, Bravo, and Strongarm. |

**Table E-3. Incidences in which causes other than chlorothalonil exposures are more likely.**

| Incident No. | Date | Species | Certainty Discussion | Certainty Index Assigned to Incident in EIIS | Incident description |
|---|---|---|---|---|---|
| I000103-008 | 2/9/ 1990 | American Robin and Cedar Waxwing | Chlorothalonil is not acutely toxic to birds. Residue analysis failed to reveal the presence of chlorothalonil in the gizzard/crop contents of these birds. However fenamiphos was found at levels ranging from15.4 to 2090 ppm | Unlikely | 58 robins and cedar waxwings were found dead in/near water in an area which had recently been treated with chlorothalonil and fenamiphos. |
| I003596-001 | 8/8/ 1994 | Trout | Chlorothalonil was not detected in the fish tissue samples; however, maneb and esfenvalerate were detected. | Possible | A fish kill took place at the Maine/New Brunswick border. Two compounds used recently on the U.S. side were Manex and Asana; on the Canadian side chlorothalonil had been used. The conclusion reached in the report was that chlorothalonil was not likely the cause of the incident. |
| I017028-001 | 8/9/ 2000 | Trout Sticklebac k | Azinphos-methyl was detected in fish tissue. Chlorothalonil was detected on the foliage of the potato farm's field, but not in the water, sediment, or fish. | Possible | Fish kill on the French River in Prince Edward Island, Canada. An unknown number of dead trout and sticklebacks were found. Approximately 50 trout were collected. Azinphos-methyl was found in the livers (0.22 ppm) and gills (0.39 ppm) of the dead trout. The azinphos-methyl was thought to originate from a potato farm up-river. However, only one trace detection of azinphos-methyl was found in a sediment sample from outside the suspected field in French River. |
| I011838-111 | 6/2/2001 | Peanut | VALOR (flumioxazin) was considered the likely cause of the incident. | Possible | To comply with 6(a)2 regulations, Valent reported a complaint from Girade, GA, that VALOR damaged 26 acres of peanuts. PROWL, BRAVO, and STRONGARM were also applied but application rates were not given. The damage symptoms were reported as; "Phytotoxicity: burnt lower leaves." |
| I013550-002 | 6/22/2001 | Potato | Incident was attributed to glyphosate contamination. | Possible | The Department of Agriculture investigated the incident and determined that there was a glyphosate contamination in the spray. |

## E.2 Uncertainties Related to the Use of Incident Information from the Ecological Incident Information System

Incident reports submitted to EPA since approximately 1994 have been tracked by assignment of incident numbers in an Incident Data System (IDS), microfiched, and then entered to a second database, the Ecological Incident Information System (EIIS). Additionally, there is an on-going effort to enter information to EIIS on incident reports received prior to establishment of current databases. Incident reports are not received in

a consistent format (*e.g.*, states and various labs usually have their own formats), may involve multiple incidents involving multiple chemicals in one report, and may report on only part of a given incident investigation (*e.g.*, residues).

Incidents entered into EIIS are categorized into one of several certainty levels regarding the likelihood that a particular pesticide is associated with the incident: highly probable, probable, possible, unlikely, or unrelated. In brief, "highly probable" incidents usually require carcass residues and/or clear circumstances regarding the exposure. "Probable" incidents include those where residues were not available and/or circumstances were less clear than for "highly probable." "Possible" incidents include those where multiple chemicals may have been involved and it is not clear what the contribution was of a given chemical. The "unlikely" category is used, for example, where a given chemical is practically nontoxic to the category of organism killed and/or the chemical was tested for but not detected in samples. "Unrelated" incidents are those that have been confirmed to be not pesticide-related.

The National Pesticide Information Center (NPIC) prepares summaries of information provided by individuals who have contacted NPIC for information or to report a pesticide incident. None of this information has been verified or substantiated by independent investigations of NPIC staff, laboratory analysis, or any other means. Thus, if a person alleges/reports a pesticide incident, it will likely be recorded as an incident by NPIC.

Incidents entered into the EIIS are also categorized as to use/misuse. Unless specifically confirmed by a state or federal agency to be misuse, or there was very clear misuse such as intentional baiting to kill wildlife, incidents are not typically considered misuse.

The number of documented kills in EIIS is believed to be a small fraction of total mortality caused by pesticides. Mortality incidents must be seen, reported, investigated, and have investigation reports submitted to EPA to have the potential for entry into the database. Incidents often are not seen, due to scavenger removal of carcasses, decay in the field, or simply because carcasses may be hard to see on many sites and/or few people are systematically looking. Poisoned animals may also move off-site to less conspicuous areas before dying. Incidents may not get reported to appropriate authorities capable of investigating the incident for a variety of reasons including the finder may not know of the importance of reporting incidents, may not know who to call, may not feel they have the time or desire to call, or may hesitate to call because of their own involvement in the kill. Incidents reported may not get investigated if resources are limited or may not get investigated thoroughly, with residue analyses, for example. Also, if kills are not reported and investigated promptly, there will be little chance of documenting the cause, since tissues and residues may deteriorate quickly. Reports of investigated incidents often do not get submitted to EPA, since reporting by states is voluntary.

Furthermore, the database relies heavily on registrant-submitted incident reports, and registrants are currently only required to submit detailed information on 'major' ecological incidents, while 'minor' incidents are reported aggregately.

Based on the 40 CFR (§159.184 Toxic or adverse effect incident reports), an ecological incident is considered 'major' if any of the following criteria are met:

> *Fish or wildlife:*
>
> (A) Involves any incident caused by a pesticide currently in Formal Review for ecological concerns.
>
> (B) Fish: Affected 1,000 or more individuals of a schooling species or 50 or more individuals of a non-schooling species.
>
> (C) Birds: Affected 200 or more individuals of a flocking species, or 50 or more individuals of a songbird species, or 5 or more individuals of a predatory species.
>
> (D) Mammals, reptiles, amphibians: Affected 50 or more individuals of a relatively common or herding species or 5 or more individuals of a rare or solitary species.
>
> (E) Involves effects to, or illegal pesticide treatment (misuse) of a substantial tract of habitat (greater than or equal to 10 acres, terrestrial or aquatic).
>
> *Plants*:
>
> (A) The effect is alleged to have occurred on more than 45 percent of the acreage exposed to the pesticide.

All other ecological incidents are considered 'minor' and only need to be aggregately reported. 'Minor' incidents reported by the registrants are not included in the EIIS database. Therefore, for example, an incident could affect 900 fish, 150 birds, 45 mammals, and 40% of an exposed crop and not be included in the EIIS database [unless is it reported by a non-registrant (*e.g.*, an incident submitted by a state agency – which are not systematically collected)]. Therefore, because the number of documented kills in EIIS is believed to be a small fraction of total mortality caused by pesticides, absence of reports does not necessarily provide evidence of an absence of incidents.