

# **AGENT WHITE a.k.a. TORDON 101**

**by**

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The herbicides used in South Vietnam are most often referred to as "Agent Orange."

This general and common use of the term is misleading. There were actually fifteen (15) different types of four chemical types used from January 1962 to September 1971, when all herbicide use in Vietnam was discontinued.[1] The total volume sprayed has been stated in amounts ranging between 17-19.4 million gallons.[2,3] Of this amount there are three of the herbicides that comprise the bulk of spray missions. They are Agent Orange, Agent White and Agent Blue.

Agent White is a herbicide and is also a two part solution. Its technical name is Tordon 101 and was made by combining the chemicals Picloram and 2,4-D.[4,5] Tordon was registered as a chemical by the United States Environmental Protection Agency (EPA) on June 14, 1963. Five and half million gallons of White were sprayed Vietnam-wide.

What the manufacturer did not admit to was the capability of the chemical manufacturing processes to produce contaminants that the science of the day was unable to remove or to reduce it's percentage in solution. In November 1980, EPA financed a study entitled "Dioxins". It was published under document number EPA-600/2-80-197. In it and I quote:

*The normal reaction sequences for 2,4-D, are analogous in their early steps to those of 2,4,5-T and others in the group just described, but occur via 2,4-dichlorophenol*

*rather than 2,4,5-trichlorophenol. The dioxin formation sequence is likewise analogous but typically would produce 2,7-DCDD (Dichlorodibenzo-P-Dioxin).[6]*

Quality standards of production of 2,4-D in Tordon 101 destined for Vietnam were not maintained. Examples exist that the same chemical-manufacturing vessel was used to produce multiple variations of herbicide components without ever cleansing between manufacturing cycles.

But just how bad is 2,7-DCDD. Even today, its only known use is that it is a contaminant of herbicide production. An acute exposure results in irreversible liver damage. [7,8,9]

We know 2,4-D by itself is not an innocent bystander.

It is however Picloram, one of the other listed active ingredients for Tordon 101 that for many is surrounded in mystery. Picloram as a specific chemical, with no mention of its contaminants is considered only slightly toxic for humans. According to EPA chemical registration data sheets, Hexachlorobenzene is not listed as an active nor inert ingredient and even under court action it is not listed. It is unscientifically classified as a Contaminant, thereby avoiding any disclosure.

In actual practice, pesticide manufacturers decide what to call inert and what to designate as an active ingredient subject to EPA regulation.....

*By EPA law, inert ingredients are not listed on Pesticide product labels. Only **active** ingredients are listed on labels. Furthermore, government officials are forbidden by law from revealing the inert ingredients in Pesticide products. Inert ingredients are confidential information*

*Under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), the U.S. pesticide law, inert ingredients are defined simply by excluding active substances.*

**Active ingredient:** *An ingredient that will prevent, destroy, repel, or mitigate any pest. (Under FIFRA, four other categories of biologically active chemicals are included in the definition of an active ingredient: plant growth regulators, defoliants, desiccants, and nitrogen stabilizers.)*

***Inert ingredient:*** Any pesticide ingredients other than an active ingredient. They are used as solvents, surfactants, diluents, carriers, catalysts, synergists, intensifiers, and more than 30 other uses.. Recent EPA policy allows the term "other" to be substituted for the term "inert" on pesticide labels.

*According to EPA policy, inerts are intentionally added substances, not contaminants. They do not include adjuvants, chemicals added by the pesticide user during application.[10]*

HCB has remained hidden from the American Public with its classification as a contaminant. By EPA's legal, albeit non-scientific definition, HCB is not intentionally added to the solution and is therefore considered neither an active nor an inert component to Picloram and allows HCB to be classified as a contaminant. This implies the manufacturer's chemists had no idea the "synergy " of production would produce HCB. To the Public and Vietnam Veterans however, this form of secrecy continues to be a basis for the belief that our government has the information and scientific studies to demonstrate the true dangers of this herbicide. Big money talks. Chemicals are a 12 billion dollar a year business.

EPA however did classify Picloram as a Restricted Use pesticide in 1978 as a result of recurring reports of phytotoxicity to economically important crops caused by contamination of water supplies. Restricted Use Pesticides may only be purchased and used by certified (trained) applicator personnel.

Continuing problems with the herbicide caused the EPA to further restudy Picloram.

Note very clearly here, that it was only Picloram itself and **not** the totality of the chemical Tordon 101 that underwent the Reregistration Eligibility Decision. It was the presence of Hexachlorobenzene in the solution along with Nitrosoamines that generated the concern with the decision document. There was no mention of any concern for the synergy of HCB at greater than 200 ppm and the 1 ppm of Nitrosoamine in solution along with 2,4-D, the listed inerts and most of all other contaminants such as 2-7-DCDD.

EPA issued a Registration Standard for Picloram in March 1985 imposing a maximum level of the manufacturing impurity for Hexachlorobenzene (HCB) in technical Picloram of 200 ppm and requiring additional studies including testing for nitrosamines. The sole

registrant completed this testing; no nitrosamines were detected in Picloram products and the level of HCB is certified to be less than 100 ppm. EPA issued a Picloram Final Registration Standard and Tolerance reassessment document in May 1988.[11, 12, 13]

There is no documentation to show just how bad the ppm concentration was in Agent White (Tordon 101) that was sprayed in Vietnam. We do know from available records on the "Ranch Hand" spray missions that the herbicides were sprayed at concentrations "six to 25 times that suggested by the manufacturer." [14]

Strangely however, when one makes a close examination of the complete documentation submitted to support the "Reregistration Eligibility Decision Case 0096 [13]," one finds a significantly high number of these supporting studies are unpublished. "Unpublished" studies are those that cannot be peer reviewed for quality scientific procedures, results and conclusions. It also has been said that "unpublished" implies that the funding and grant money that made the studies possible came from the manufacturer itself.

**Careful note here.** The contaminant we are examining here is not a dioxin or furan. It is a chemical component of Picloram, a formula that is result of the manufacturing process that has unique capabilities to harm plants and animals and is also a highly probable carcinogen for humans. Since it is just chemicals we are talking about, and particularly their effect in the **environment**, I have problems understanding how the DVA can arbitrarily and capriciously ignore the contaminants and dismiss their presence in the environment of Vietnam and their affect on Veterans.

Chemicals in the Environment are normally the charter and jurisdiction of the EPA, and the EPA has established that Picloram, HCB and its biodegradable successor,

Pentachlorophenol (Penta) can and do harm to the liver, kidneys, blood, lungs, nervous system, immune system, and gastrointestinal tract. [15,16,17]

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine safe level of chemicals in drinking water, which do or may cause health problems. These non-enforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals (MCLG).

*The MCLG for Picloram has been set at 0.5 parts per million (ppm) because*

*EPA believes this level of protection would not cause any of the potential health problems described below. Based on the MCLG, EPA has set an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, considering the ability of public water systems to detect and remove contaminants using suitable treatment technologies. The MCL has also been set at 0.5ppm because EPA believes, given present technology and resources, this is the lowest level to which water systems can reasonable be required to remove this contaminant should it occur in drinking water*

### ***What are the Health Effects?***

*Short-term: EPA has found picloram to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: Damage to central nervous system, weakness, diarrhea, weight loss.*

*Long-term: Picloram has the potential to cause the following effects from a lifetime exposure at levels above the MCL: liver damage.[18]*

Hexachlorobenzene seeks out aquifers and has been found at depths greater than 45 feet.

It is relatively stable in Water. In loamy soil, it biodegrades and gives up a chloride ion and becomes Pentachlorophenol (Penta). If ingested, HCB undergoes an immediate chemical change to become Penta.[19] Penta is also dangerous if inhaled, ingested with food or through dermal contact. The day to day red dust that coated our bodies and clothing in the defoliated areas of Vietnam had to contain HCB and Penta and lord knows

what else. The drinking water we took from the streams that ran through the defoliated areas where the HCB would break down in the soil would have Penta up near the surface and HCB the heavier chemical towards the bottom. All the water purification tablets in the world could not remove these contaminants.

This is not unique as the local streams were for most field troops the only day to day source of water to drink. Everything we drank all day was processed from the stomach and intestines out through our outer skin to become sweat. All day we drank so that we could urinate at least once a day, to demonstrate we were not dehydrating. Since the liver is the great filter of fluids in the body, the contaminants, possible dioxins and other chemicals had to pass through this organ. What was not used as sweat, had to go someplace; I suggest the fatty tissues, bones and internal organs.

What exactly do we know about Tordon 101 as a chemical mixture. In 1963 Tordon 101 was registered under number 000464-0036 with an approval date of 19630614. Its listed active chemicals were then:

10.2000 % of (00512)

**Chemical Names: (Common Name, Synonym, Trade Names)**

℞•AMINO-3,5,6-TRICHLORO-2-PYRIDINECARBOXYLIC ACID,  
TRIISOPROPANONAMINE SALT

℞•AMINO-3,5,6-TRICHLOROPICOLINIC ACID, TRIISOPROPANOLAMINE SALT

℞•CAS REG. NO. 6753-46-5

℞•PICLORAM, TRIISOPROPANOLAMINE SALT

℞•PYRIDINECARBOXYLIC ACID, 4-AMINO-3,5,6-TRICHLORO-, COMPD. WITH  
1,1,1"-NITRILOTRIS (2-PROPANOL) (1:1) [20]

39.6000% OF (030035)

**Chemical Names: (Common Name, Synonym, Trade Names)**

☞2,4-D, TRIISPPROPANOLAMINE SALT

☞2,4-D, TRIISOPROPANOLAMMONIUM SALT

☞ACETIC ACID, (2,4-DICHLOROPHENOXY)-,COMPD. WITH 1, 1", 1"-NITRILOTRIS(2-PROPANOL) (1:1)

☞CAS REG. NO. 32341-80-3

☞CURTAIL COMPONENT OF (WITH 117403)

☞DICHLOROPHENOXYACETIC ACID, TRIISOPROPANOLAMINE SALT

☞ TRIISOPROPANOLAMINE 2,4-DICHLOROPHENOXYACETATE [20]

As a result of the Reregistration Eligibility Decision circa 1988, Tordon 101 changed

its formula with an approval date of 19891204. Note the variance of chemical percentages for 00512 and 030035. This change resulted in a reduction of over 100-ppm of HCB within Picloram. Yet HCB is still listed as an unintended result or contaminant of the formulation of Tordon 101. How can you change the amounts of active chemicals to meet a mandated reduction of a contaminant and then say it is still an unintended result. This fact even defies the rules of basic logic.

Below, the chemicals, at least what is listed as the active ingredients. Still a significant threat to plants animals and humans yet its contaminant has yet to be revealed to citizens of the United States:

5.4000 % of (00512)

**Chemical Names: (Common Name, Synonym, Trade Names)**

℞•AMINO-3,5,6-TRICHLORO-20PYRIDINECARBOXYLIC ACID,  
TRISOPROPANONAMINE SALT

℞•AMINO-3,5,6-TRICHLOROPICOLINIC ACID, TRIISOPROPANOLAMINE SALT

℞•CAS REG. NO. 6753-46-5

℞•PICLORAM, TRIISOPROPANOLAMINE SALT

℞•PYRIDINECARBOXYLIC ACID, 4-AMINO-3,5,6-TRICHLORO-,COMPD. WITH  
1,1",1"-NITRILOTRIS (2-PROPANOL) (1:1) [21]

20.9000% OF (030035)

**Chemical Names: (Common Name, Synonym, Trade Names)**

℞•2,4-D, TRIISPPROPANOLAMINE SALT

℞•2,4-D, TRIISOPROPANOLAMMONIUM SALT

℞•ACETIC ACID, (2,4-DICHLOROPHENOXY)-,COMPD. WITH 1, 1", 1"-  
NITRILOTRIS(2-PROPANOL) (1:1)

℞•CAS REG. NO. 32341-80-3

℞•CURTAIL COMPONENT OF (WITH 117403)

℞•DICHLOROPHENOXYACETIC ACID, TRIISOPROPANOLAMINE SALT

℞• TRIISOPROPANOLAMINE 2,4-DICHLOROPHENOXYACETATE[21]

Oh yes, efforts have been taken in court trying to get to the truth surrounding the

secrets of Tordon 101 and other herbicides. In a March 21, 1997 court case, RE: NCAP,  
et al. V. Browner, Civil Action No 94 1100 (JR) the inert ingredients identified under the  
court order for Tordon 101 were ordered released. The listed inert ingredients are  
Polyglycol (Confidential), Versene Acid 60-00-4, Triisopropanolamine 122-20-3 and  
Isopropanol 67-63-0. HCB however was never released as it still carries the label  
"Contaminant", neither active nor inert. While no percentages in solution were provided,



the inerts listed above for Tordon 101, are also not innocent bystanders in the potential risk they can pose to exposed humans.

Below are questions, listed with the answers provided by EPA on HCB and Penta. They are guidance and rules on what is applicable to **today**™s formulas and mixtures and not that of the low cost heavily contaminated herbicides used in Vietnam.

**The questions are:**

**What happens to Hexachlorobenzene it enters the environment?**

- ℞• Hexachlorobenzene can remain in the environment for a long time.
- ℞• It breaks down very slowly.
- ℞• It does not dissolve in water very well, so most of it will remain in particles on the bottom of lakes and rivers.
- ℞• Hexachlorobenzene sticks strongly to soil.
- ℞• High levels can build up in fish, marine mammals, birds, lichens, and animals that eat lichens (like caribou) or fish.
- ℞• It can also build up in wheat, grasses, some vegetables, and other plants. [22]

**How might I be exposed to Hexachlorobenzene?**

- ℞• Eating low levels in contaminated food
- ℞• Eating contaminated fish
- ℞• Drinking milk or eating dairy products or meat from cattle grazing on contaminated pastures
- ℞• Drinking small amounts in contaminated water
- ℞• Breathing low levels in contaminated air
- ℞• Eating or touching contaminated soil

℞• For babies, drinking contaminated breast milk from exposed mothers

℞• Working at a factory that uses or produces it unintentionally [22]

### **What happens to Pentachlorophenol when it enters the environment?**

℞• Pentachlorophenol generally sticks to soil particles, but its movement in soils depends on the soil's acidity.

℞• Not much pentachlorophenol will evaporate into the air.

℞• It lasts for hours or days in air, soils, and surface waters.

℞• It doesn't dissolve easily in water.

℞• In soils and surface waters, microorganisms break it down into other compounds.

℞• Sunlight breaks it down in surface waters and air.

℞• Some of the break-down compounds may harm people.

℞• It is present in fish, but tissue levels are usually low because pentachlorophenol breaks down in the body.[23]

### **How might I be exposed to Pentachlorophenol?**

℞• Breathing contaminated air while working with treated wood at wood-treatment facilities and lumber mills

℞• Touching treated lumber, for example, in wood-treatment facilities and lumber mills or in construction or farming

℞• Breathing contaminated air from log homes made from pentachlorophenol-treated logs

℞• Breathing contaminated air near waste sites, sites of accidental spills, and work sites

℞• Touching contaminated soil at waste sites and landfills

℞• Drinking contaminated water near waste sites, sites of accidental spills, and work sites

℞• Eating contaminated food, such as fish, or drinking contaminated water, but these exposures are low and are not very common. [23]

Questions above are based on formulas, made with modern equipment, filtering devices and improvements in the quality of basic chemicals used. What kind of concern would the EPA have for the herbicides used in Vietnam at their levels of impurity based on low cost for higher profits.

Take for instance a different defoliant, never used in Vietnam called Dacthal or DCPA. It was manufactured with less than 1 ppb (Picloram by contrast is now certified at less than 100 ppm), yes one billionth of a part in solution of HCB and 2,4,5-T. Read thoroughly the concerns over this small concentration of contaminants compared to Tordon 101. I have provided just two of EPA's Regulatory Positions below for your review:

A. The Agency will not initiate a Special Review on DCPA at this time. There are presently no chronic toxicological concerns for exposures to DCPA; however concerns for the chronic toxicological effects of the two manufacturing impurities 2,3,7,8-TCDD and HCB have not been resolved by the available information. At the present time the Agency does not consider the risks due to 2,3,7,8-TCDD from the use of DCPA to be unreasonable. The highest risk estimated was 10 to the minus 6 for agricultural applicators and PCOs.

The Agency is concerned about the risks due to HCB from the use of DCPA which are 10 to the minus 6 for dietary exposure and 10 to the minus 4 for agricultural applicators, PCOs and a child exposed while playing on a treated lawn. The applicator exposures can be reduced by using protective clothing. The uncertainties in the exposure estimates used to assess the risk to children playing on a DCPA-treated lawn are so great that the Agency believes that the risk assessment cannot be used to determine whether criteria for initiating a Special Review have been exceeded. These exposure estimates will be refined when data on foliar and soil exposure to HCB become available. The Agency believes the dietary risk to HCB from DCPA uses is acceptable while required metabolism and residue data are being developed.

C. The Agency is requiring registrants to certify that the levels of 2,3,7,8-TCDD and HCB in DCPA used to formulate their products do not exceed 0.1 ppb and 0.3 percent, respectively. This measure will assure that the levels of these impurities in commercially available DCPA products do not exceed the reported maximum levels upon which the

Agency based its risk assessment. Registrants must also analyze their products for other species of dioxins and establish certified limits for these impurities as well. [24]

Why isn't the same concern given to Tordon 101. Is it money? Is it fear the American public will become alarmed by the failure of the EPA to properly warn them and impose restrictions for Tordon 101 in proportion to those for Dacthal? [24,25]

In summary, this study has shown that:

a. Agent White a.k.a. Tordon 101 in the formula state used during herbicide spraying in Vietnam and sprayed at the documented levels of concentration has the potential to harm target organs in the gastrointestinal area.

b. That few "published" studies exist that allow a peer review look at the dangers of the combined effects, "synergy" of Tordon 101 as a total chemical.

c. That Hexachlorobenzene is a danger to the environment and to humans at concentrations well below that to which veterans in Vietnam were exposed.

d. That veterans serving in defoliated areas in Vietnam that drank the water, ate the dust, breathed the dust and lived in the dust are at risk from the potential damages caused by Tordon 101 formula used in Vietnam.

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