Water Quality Control Commission

Hearing on New Mexico Department of Game and Fish Petition
to Deploy A Piscicide in the Upper West Fork Gila River Drainage

September 12, 2002

Technical Testimony
by Ann McCampbell, MD

My name is Ann McCampbell. I am a medical doctor interested in environmental health. I am also Chair of the Multiple Chemical Sensitivities Task Force of New Mexico.

I am testifying against this petition because the proposed application of Fintrol to the upper West Fork Gila River drainage poses an undue risk to health and the environment. There is no assurance that the chemicals in this product will not harm humans and wildlife or contaminate downstream waterways. To the contrary, there are many indications that the deployment of Fintrol will adversely impact the environment and many nontarget species. In addition, there are extensive data gaps regarding the toxicity and environmental fate of the active ingredient, antimycin A.

There are at least 6 chemicals proposed for use in this project. Fintrol concentrate contains antimycin A, acetone, and soy lipids. Fintrol diluent, with which the concentrate is mixed, contains diethyl phthalate, nonoxyl-9, and acetone. Potassium permanganate, and possibly a fluoroscent dye, would also be deployed.

ANTIMYCIN A

Antimycin A is a highly toxic pesticide and poison. It is not an antibiotic (Exhibit 1) or a pharmaceutical agent. Although antimycin A is derived from bacteria, it has more in common with cyanide than penicillin. Like cyanide, antimycin A blocks electron transport in mitochondria causing cellular anoxia.

Fintrol concentrate carries the highest acute toxicity rating given by the U.S. Environmental Protection Agency (EPA), Toxicity Category I. The label contains the warning “DANGER POISON” next to a skull and crossbones. Under “hazards to humans and domestic animals” it says this product is “FATAL IF SWALLOWED” and “MAY BE FATAL IF ABSORBED THROUGH THE SKIN”.

According to its Material Safety Data Sheet (Exhibit 2), the oral LD 50 of antimycin A in rats is 30 mg/kg, that is, it takes 30 mg/kg of ingested antimycin A to kill half the test animals. According to an EPA Chemical Profile (Exhibit 3), the LD 50 for guinea pigs is even lower at an extraordinary 1.8 mg/kg. Pesticides with an oral LD 50 less than 50 mg/kg meet the criteria for EPA Toxicity Category I. To put this in perspective,

pesticides in the other three EPA toxicity categories have much higher oral LD 50 values. The oral LD 50 for Category II pesticides is 50-500 mg/kg, for Category III pesticides it is 500-5000 mg/kg, and is greater than 5000 mg/kg for Category IV pesticides (1).

The Hazards Information section of the Material Safety Data Sheet (Exhibit 2) states that routes of entry for antimycin A include the skin, inhalation, and ingestion. The ingestion hazard rating is "highly toxic". Antimycin A is also noted to be an eye, skin and respiratory irritant. Target organs include eyes, skin, respiratory tract, cardiovascular system, nervous system, kidneys, and possibly fetus. Inhalation of vapors or aerosol can irritate the eyes, nose, and respiratory tract. Direct contact with skin or eyes can produce severe irritation. And systemic intake can produce a decrease in blood pressure, nausea, light headedness, dizziness, excitement, incoordination, weakness, loss of coordinated speech and drowsiness. Medical conditions said to be aggravated by antimycin A exposure are pre-existing eye, skin, respiratory, kidney, nervous system or cardiovascular ailments.

A University of California at Santa Cruz Laboratory Standard Operating Procedure guide on antimycin A (Exhibit 4) states that this material is considered a Particularly Hazardous Substance by the CAL OSHA Lab Standard. It also says that antimycin A is "highly toxic" and "may be fatal if swallowed, absorbed through skin, or inhaled". It notes that "respiratory distress, impaired reflexes, incoordination, and terminal symptoms consistent with CNS (central nervous system) depression have been reported in experimental animals poisoned by the oral or parenteral route."

ToxNet Hazardous Substance Databank Information on antimycin A, which includes data from PoisonDex (Exhibit 5), states that respiratory distress, incoordination, impaired reflexes, and CNS (central nervous system) depression have occurred in animals. It further notes that *the minimum lethal human exposure level is unknown*.

Besides its extreme acute toxicity, ToxNet also states that antimycin A is an experimental MUTAGEN. The NIOSH Registry of Toxic Effects of Chemical Substances (RTECS) (Exhibit 6) also includes "mutation data" on antimycin A. And there are 36 references regarding antimycin on the ToxNet Environmental Mutagen Information Center (EMIC) web page (2). At least one study describes antimycin-induced DNA fragmentation and strand breaks (Exhibit 7).

Perhaps most importantly, there is a disturbing lack of knowledge about the full range of toxicity of antimycin A. Fintrol was initially registered in 1977 (3) before the EPA adopted more stringent registration requirements. In a 1987 EPA Chemical Profile on Antimycin A (Exhibit 3) data was "not found" in most categories evaluated -- from physical and chemical properties to health hazards -- despite a search of 15 data sources.

In addition, the California Department of Pesticide Regulation recently rejected the registration of Fintrol in that state because of insufficient data regarding its toxicity and environmental fate (Exhibit 8). There are as well concerns among fish managers that Fintrol may lose its federal EPA registration (Exhibits 1 & 9).

There are numerous tests on Fintrol and antimycin that have not been done, let alone passed. In particular, there is little known about antimycin's breakdown products, including their toxicity and persistence, nor is there currently a chemical analytical method capable of measuring antimycin in deployment concentrations (Exhibit 1).

The data gaps that were identified by California include (Exhibit 8):

1) Acute dermal studies on the technical grade active ingredient
2) Primary eye studies on the technical grade active ingredient
3) Dermal irritation studies on the technical grade active ingredient
4) Acute dermal studies on the formulated product
5) Primary eye studies on the formulated product
6) Dermal irritation studies on the formulated product
7) Acute oral toxicity study on the diluent
8) Acute dermal toxicity study on the diluent
9) Primary eye study on the diluent
10) Dermal irritation study on the diluent
11) Product chemistry for Antimycin A technical
12) Description of the manufacturing process
13) Discussion of formation of impurities
14) Preliminary analysis and certified limits of antimycin
15) Enforcement analytical method for antimycin
16) Data for hydrolysis
17) Data for aqueous photolysis
18) Data for anaerobic aquatic metabolism
19) Data for aerobic aquatic metabolism
20) Data for leaching and adsorption/desorption
21) Data for magnitude of residue in fish
22) Adequate fish and wildlife data

The New Mexico Department of Health also has reservations about the safety of antimycin use. Its position as of August 13, 2002 is (Exhibit 10):

"*The New Mexico Department of Health has not yet fully evaluated the possible adverse health effects of human exposure to antimycin used in native fish restoration projects. We understand that, on our recommendation, the New Mexico Department of Game and Fish is contracting with a toxicologist to conduct a study of possible health risks before the next intended application of Fintrol (active ingredient: antimycin). The Department of Health awaits the results of this study in determining its opinion.*"

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DIETHYL PHTHALATE

The EPA considers diethyl phthalate to be an endocrine disruptor. Endocrine disruptors mimic natural hormones and have an adverse effect on the structure or functioning of the endocrine system, which includes the pituitary, hypothalamus, thyroid, adrenals, pancreas, thymus, ovaries, and testes. Compounds which are toxic to the endocrine system can cause health effects ranging from hypothyroidism and diabetes to infertility, low sperm count, birth defects, and testicular, breast, and prostate cancer.

There is growing scientific concern about the health impacts of human exposure to endocrine disrupting chemicals, in large part because of their widespread presence in the environment and because their adverse effects can often be caused by extremely minute quantities, at levels not previously considered to be in the toxic range.

For example, a recent study found that frogs exposed during larval development to as little as .1 part per billion (ppb) of the herbicide atrazine developed male and female sex organs (Exhibits 11 & 12). The authors concluded that "this widespread compound and other environmental endocrine disruptors may be a factor in global amphibian declines".

Diethyl phthalate is a priority pollutant under the Clean Water Act. It is also listed as a hazardous constituent under the Resource Conservation and Recovery Act and as a hazardous substance under Superfund (4). The EPA may be considering the removal of diethyl phthalate from all pesticide products (Exhibit 1).

According to a National Toxicology Program fact sheet (5), diethyl phthalate is toxic by ingestion and inhalation and poisonous by the intravenous route. It is an irritant of the skin, eyes, mucous membranes and upper respiratory tract. It is a narcotic in high concentrations. It is also listed as an experimental teratogen, which means it can cause birth defects in developing fetuses, and it can cause other experimental reproductive effects. Studies have shown, for example, abnormal development of male fetuses in rats exposed to this chemical (6).

The New Jersey Department of Health and Senior Services Hazardous Substance Fact Sheet (7) notes numerous toxic effects of diethyl phthalate. Exposure to vapors can irritate the nose and throat. Contact can irritate the eyes and skin, and repeated exposure may damage the nervous system. It also notes that chronic (long-term) health effects can occur at some time after exposure to diethyl phthalate even if the exposure levels were not high enough to make someone immediately sick. It also warns that there is evidence that diethyl phthalate is a teratogen in animals and that until further testing is done, this chemical should be treated as a possible teratogen in humans. And while those working directly with diethyl phthalate are at higher risk than the general public, the fact sheet states that people in the community may be exposed to diethyl phthalate in contaminated water and air and that children and people who are already ill would be at the most risk of developing health problems from it.

Diethyl phthalate is moderately persistent in the environment and has moderate acute and chronic toxicity to aquatic life. According to one source, the concentration of diethyl phthalate found in fish tissues is expected to be somewhat higher than the average concentration found in the water from which the fish was taken (8).

Finally, one can not be sure that the diethyl phthalate in the Fintrol product is not contaminated with other phthalates, such as diethyl-hexyl phthalate (DEHP), which is listed as a chemical known to the state of California to cause cancer (California's Proposition 65 list, June 22, 2001).

NONOXYL-9

According to Philip Dickey in his publication "Troubling bubbles" (9), nonoxyl 9 is an alkylphenol ethoxylate that can disrupt the endocrine systems of fish, birds, and mammals. For example, nonylphenol, a breakdown product of nonylphenol ethoxylate, can cause a reduction in testicular size in rainbow trout and cause male trout to produce an egg-yolk protein that is normally only produced by females. Rats administered nonoxynol-9 in one study produced a statistically significant, dose-related number of fetuses with both extra ribs and slightly dilated pelvic components.

Nonylphenol ethoxylate is also noted for its slow incomplete biodegradation. It tends to persist in the environment and bioconcentrate. Many times the breakdown products are more toxic to aquatic life than the original chemical. There is evidence for synergism between nonylphenolic metabolites, indicating that the adverse effects from a mixture of compounds may be greater than the sum of the effects from the individual compounds. Nonylphenolic compounds have been detected in groundwater. Alkylphenol ethoxylates have been banned in many countries in Europe. And it is the recommendation of the author that the use of alkylphenol ethoxylates as inert ingredients in pesticide formulations applied to aquatic environments be discontinued.

ACETONE

Acetone is a volatile neurotoxic solvent, which can cause central nervous system depression (Exhibit 2). It constitutes more than 50% of the Fintrol product.

POTASSIUM PERMANGANATE

Potassium permanganate is a hazardous caustic alkali. Targets organs include the respiratory and central nervous system, blood, and kidneys (10). If swallowed, it can cause nausea, vomiting, gastrointestinal irritation and burns to the mouth and throat. It may also cause severe irritation or burns to the eye and skin. Prolonged inhalation of potassium permanganate can cause manganism from a toxic build up of manganese in one's body. According to one Material Safety Data Sheet (11), potassium permanganate

has also been reported to cause reproductive toxicity in laboratory animals and states that the ecological effects of this product have not been evaluated.

Potassium permanganate can be directly toxic to fish, even at deployment concentrations of 1 part per million (Exhibit 13). It can also kill algae which provides oxygen for fish (12) and kill phytoplankton and macrophytes that fish use for food (13).

Although potassium permanganate will help neutralize the antimycin A it comes in contact with, it does have its limitations. According to the authors of "Limitations on Potassium Permanganate Detoxification of Antimycin" (Exhibit 14), potassium permanganate rapidly detoxifies antimycin to a toxicity level equivalent to about 4% of the original concentration. From there on, the detoxification is quite slow. They conclude that the use of antimycin-potassium permanganate systems in fish control would probably entail undue risk in most situations involving antimycin-sensitive fish, soft water and a need for rapid detoxification. There will also inevitably be some uneven mixing of potassium permanganate with antimycin A as well as other factors that retard their chemically reacting with each other.

It is overly optimistic to think that potassium permanganate will totally neutralize antimycin A or that deploying another toxic chemical will return the stream to its former non-polluted condition. It also ignores the fact that potassium permanganate will have little or no effect on the levels of acetone and nonoxyl-9 present.

EPA REGISTRATION AND SAFETY

Those in favor of using antimycin in fish restoration projects argue that Fintrol is an EPA registered product and therefore safe to use. But **registration of a pesticide by the EPA does not mean it is safe**. This cannot be stressed enough. Legal use does not equal "safe" use. EPA has specifically stated that, "Pesticides are *not* safe. They are produced specifically because they are toxic to something" (14). In fact, it is against federal FIFRA law for a manufacturer to claim or imply that its product is "safe", "harmless," or "nontoxic to humans and pets" (15) or endorsed by the EPA (16).

Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)

40 CFR 156.10(a)(5), Labeling Requirements for Pesticides, False or Misleading Statements.

"… a pesticide is misbranded if its labeling is false or misleading …Examples of statements or representations in the labeling which constitute misbranding include:

(ix) Claims as to the safety of the pesticide or its ingredients, including statements such as 'safe,' 'nonpoisonous,' noninjurious,' 'harmless' or 'nontoxic to humans and pets' with or without such a qualifying phrase as 'when used as directed';

(v) Any statement directly or indirectly implying that the pesticide or device is recommended or endorsed by any agency of the Federal Government;"

Another shortcoming of pesticide regulation is that chronic toxicity tests are usually only done on the active ingredient rather than the whole product and manufacturers are not required to reveal the so-called "inert" ingredients in their products (other than to the EPA) even though they can be more toxic than the active ingredient. Neither are the "inert" ingredients required to be listed on pesticide product labels. The Fintrol label names several "inert" ingredients, but not all of them are listed (17).

Another argument by proponents for antimycin use is that it will be used in such low concentrations that no harmful effects will occur. But this ignores the possibility of misapplications and spills, especially of the concentrated product (which are not uncommon with pesticides), endocrine-disrupting effects that can occur at extremely low levels, and the fact that the full toxicity of the individual or combination of chemicals in Fintrol is unknown.

CHEMICAL SENSITIVITY

Some individuals are much more sensitive to toxic exposures than others. Just as different species of fish and different fish of one species have varying sensitivities to antimycin A, so are there likely to be huge differences in human susceptibility to it (as well as the other chemicals in Fintrol). A survey by the New Mexico Department of Health found that 16% of the respondents to a statewide random population-based survey reported that they were unusually sensitive to common chemicals, including pesticides (Exhibit 15). The percentage of respondents who reported being chemically sensitive were the same for those living in rural and urban areas in all parts of the state.

The governor and several state agencies in New Mexico acknowledge that there are New Mexicans who are chemically sensitive. The brochure on multiple chemical sensitivities which contained the above survey statistics was written by the Multiple Chemical Sensitivities Task Force in collaboration with, and endorsed by, the New Mexico Departments of Health, Environment, and Education and the Governor's Committee on Concerns of the Handicapped. Governor Gary Johnson also proclaimed Multiple Chemical Sensitivity Awareness Week in 1998 (Exhibit 16).

Chemically sensitive people can react adversely to even minute exposures to pesticides at levels that are many orders of magnitudes below levels that would harm the average person. In addition, at least some chemically sensitive people already suffer from a defect in oxygen utilization -- the exact toxic effect of antimycin A. This is evidenced by high venous oxygen levels in these individuals indicating that oxygen is not being taken up and used by body tissues. Thus, these people are already in cellular respiratory distress. They can ill afford even the smallest additional loss of mitochondrial function which exposure to antimycin A could cause. Children, the elderly, pregnant women, and those with other chronic illnesses are also more susceptible to toxic chemicals.

Since Fintrol is a pesticide, it is likely that chemically sensitive people would react adversely to even very low levels of exposure to it. This could occur through consumption of or contact with downstream water. In addition, some applicators and staff deploying Fintrol may have some degree of chemical sensitivities and also be at increased risk from exposure to the chemicals in this product.

MACROINVERTEBRATES

While the petition acknowledges that antimycin will have an initial adverse impact on stream macroinvertebrates, it assumes that the macroinvertebrate community will eventually return to its pretreatment status. But several studies have found that while macroinvertebrate communities frequently return, they may be altered from their original composition (18, 19). And many unanswered questions remain regarding the long-term effect of antimycin on macroinvertebrates.

According to a NM Department of Game and Fish study in 2001 by fisheries biologist Steven Sanders, "the use of antimycin for fish eradication is extensive in the USA, but its affects on benthic populations are not well known" (19).

In a report prepared by Daniel McGuire entitled "Aquatic Macroinvertebrate Survey of Animas, Seco and South Palomas Creeks" (20), the author states that with respect to proposed use of Fintrol in those creeks, "a few macroinvertebrate taxa that are particularly sensitive to antimycin and have poor recuperative powers may suffer long-term impacts from the (antimycin) treatment". This is also likely true for macroinvertebrates in the upper West Fork Gila River drainage, with the largest impact expected to occur in organisms with the longest reproductive cycles. There may also be uniquely adapted macroinvertebrate species that do not return at all.

AMPHIBIANS

It is well recognized that there has been a disturbing global decline in amphibian populations in recent years and many scientists suspect that exposures to toxic chemicals are a significant cause. Several studies have linked pesticide exposure to adverse effects in frogs. As mentioned above, one study found that frogs exposed to as little as .1ppb of the herbicide atrazine developed male and female sex organs (Exhibits 11 & 12). Another study found that frogs exposed to either atrazine or a pyrethroid insecticide, esfenvalerate, were more susceptible to infection by a parasitic worm that caused limb deformities. (Exhibits 17 & 18). The pesticides appeared to depress the frogs' immune systems even at the low concentrations used, which were within EPA drinking water standards for humans. The authors concluded that "these negative impacts may help explain pathogen-mediated amphibian declines in many regions."

In another study (Exhibit 19), frogs given trace amounts of DDT experienced a near total collapse in their immune systems, which was identical to their exposure to cyclophosphamide. The latter is a drug given to humans to suppress their immune

systems so they do not reject organ transplants. The researchers found that as little as 75 ppb DDT caused frogs' immune systems to malfunction.

In a 2002 report by Bruce Christman, "Investigations of the Status and Distribution of Amphibians on the Ladder Ranch with Special Emphasis on the Chiricahua Leopard Frog" (21), he expressed concern about the threat of chytrid fungus to amphibians on the Ranch. He further noted that this fungus has been implicated as a cause of a recent decline in a population of Chiricahua leopard frogs in New Mexico. He then suggests sanitation measures to help reduce the spread of chytrid fungus.

But as important at these measures are, infectious disease does not just occur because an animal is exposed to an infectious agent. Disease only results when an animal's immune system is unable to protect it from the agent. This is especially true of fungal agents, which often cause opportunistic infections in hosts with weakened immune systems. Therefore, in order to reduce the incidence and spread of chytridiomycosis, it is as important to avoid harming amphibian immune systems as preventing their exposure to the chytrid fungus.

To avoid causing such harm, the environment must be kept as free of pollutants as possible since, amphibian immune and endocrine systems are very fragile and can be adversely impacted by even extremely low levels of toxic chemicals. Thus, even if poisons such as antimycin/Fintrol do not kill amphibians immediately, they may still harm them by making them more vulnerable to serious diseases due to immune suppression, or cause them to have developmental abnormalities or reduced fertility via endocrine disruption.

CHIRICAHUA LEOPARD FROG

The U.S. Fish & Wildlife Service (Exhibit 20) has recently listed the Chiricahua leopard frog as a threatened species. The draft Environmental Assessment (EA) for Gila Trout Restoration in the Upper West Fork Gila River (22) states that the Chiricahua leopard frog occurs in the project. The draft EA further states that any Chiricahua leopard frogs or tadpoles found would be removed prior to Fintrol application and returned to their habitat once the stream is detoxified. Even with this mitigation measure, individuals will undoubtedly perish, either from exposure to the chemicals or handling stress (23). This is an unacceptable loss for a federally listed species.

ERRORS IN THE DRAFT ENVIRONMENTAL ASSESSMENT

The draft environmental assessment (EA) for this project (22) concludes that there will little to no collateral damage to non-target species because the amount of antimycin to which they are exposed will be well below certain LD 50's. But the LD 50 is only a measure of acute toxicity. And it only measures mortality, not morbidity or chronic health effects. Therefore, any organism containing mitochondria [i.e., all animals, higher

plants (Exhibit 21), and eukaryocytic microorganisms (24)] could be sick at much lower doses. And LD 50's are only known for a handful of possible nontarget organisms.

In addition, the LD 50 also does not measure possible chronic toxic effects like immune, nervous system, or reproductive harm, endocrine disruption, mutagenicity, birth defects, or carcinogenicity, issues which have yet to be resolved regarding antimycin's toxicity. In fact, even Dr. Stephen Wust, witness for the New Mexico Department of Game and Fish at the Las Animas Hearing on August 14, 2002 testified that that the carcinogenic potential of antimycin is not known (25). Further the LD 50 of antimycin does not address the toxicity of the full Fintrol product. Therefore, one cannot conclude that no nontarget species, including humans, will be adversely effected by antimycin based solely on a limited number of animal LD 50's.

Another unwarranted assumption in the draft EA is that antimycin will only be deployed at 10 ppb. Besides the possibilities of spills, miscalculations, and imprecise applications made with backpack sprayers, the practice of running numerous (up to 50) deployment stations at one time along a stream must surely amplify the concentration of antimycin to well beyond 10 ppb as it passes by one drip station after another. However, since the concentration of antimycin cannot be chemically measured, actual *deployment concentrations are not known*. Spills of undiluted Fintrol concentrate or leaks from backpack sprayers containing only partially diluted Fintrol (leaks have occurred in previous projects, petition Appendix C) would obviously result in environmental contamination at much higher concentrations of antimycin than 10 ppb.

WILDERNESS ACT

Wilderness Areas were set aside by Congress to preserve nature and protect it from the activities of man. These are pristine places where value is placed on native ecosystems and *all* plant and animal species, not just game and sportfish. Specifically, the Wilderness Act defines wilderness as an area "where the earth and its community of life are untrammeled by man," a land that retains its "primeval character and influence," and a land that is to be managed to "preserve its natural conditions" (26). The proposal to dispense poison into a wilderness -- which will kill all fish, forever alter the macroinvertebrate community, and potentially affect many other nontarget species -- is inconsistent with all of these principles.

Aldo Leopold is widely acknowledged as that father of wilderness ecology. He stressed that all species have value and should be protected, not just one's favorites. He said, for example, that one cannot truly love the land if one pollutes the water and vice versa.

> "*The last word in ignorance is the man who says of an animal, or plant: 'What good is it?' …. If the biota, in the course of aeons, has built something we like but do not understand then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering.*"
> -- Aldo Leopold (27)

Proponents of the upper West Fork Gila River project will probably argue that returning native fish to wilderness areas helps restore them to their "natural conditions" and, therefore, is desirable and acceptable. But clearly, methods used for such restoration are *not* acceptable if they, like Fintrol, pollute the environment, damage other species, and have the potential to do more harm than good.

Some proponents also argue that the amount of environmental contamination that would be caused by deploying Fintrol in the upper West Fork Gila River drainage pales compared to other sources of water pollution and hence is insignificant. But it is precisely because so much of the rest of the world has become polluted with toxic chemicals that wilderness areas must be aggressively protected. Wilderness areas are some of the last unpolluted places on Earth. They are meant to be safe sanctuaries for all native species, some of which have yet to be even identified. Therefore, they must be held to the highest possible standard when it comes to keeping them free of toxic pollutants.

FOREST MANAGEMENT OF WILDERNESS

In Chapter 2320 of the United States Forest Service Manual on Wilderness Management, it directs agencies to manage wilderness to "preserve natural ecological conditions" (28). It also prescribes that wilderness areas be maintained in such a manner that "ecosystems are unaffected by human manipulation …" and "provide an environment where the forces of natural selection and survival rather than human actions determine which and what numbers of wildlife species exist". Proposing to poison wilderness streams that will result in the significant alternation of the aquatic community surely constitutes "human manipulation" and violates Forest Service policy.

The Manual also instructs agencies to "provide protection for known populations and aid recovery in areas of previous habitation of federally listed threatened or endangered species and their habitats". While this can be used to argue for Gila trout restoration, it equally applies to Chiricahua leopard frog. Not only should projects such as the one proposed not be done because it will adversely affect this species, actions should be taken to augment its population and expand its range.

Also according to the Manual, Regional Foresters may permit dropping of fish from aircraft for those waters where this practice was established before the area was designated a wilderness. It is unlikely that helicopters were used in the Gila River drainage (as proposed in the current project) prior to the designation of the Gila Wilderness, since the Gila Wilderness was designated in 1924 at the time when no helicopter had flown for more than eight minutes.

ERRORS AND DEFICIENCIES IN THE PETITION

Cites that it is submitted under 110.5 General Standards when the hearing notice states that the petition is pursuant to 20.6.4.12.F.

Appendix A contains outdated Fintrol Concentrate Label. See Exhibit 22 for correct one, including Use Direction Leaflet and recommended bioassay procedure. Fintrol Concentrate became a restricted use pesticide on September 27, 1999 (Exhibit 23).

Fails to list rainbow-Gila hybrids under target species, even though they are present in the project area according to the draft EA.

Extremely inadequate list of potential nontarget species, including 24 special status species which are noted in the draft EA to be "potentially-affected by the proposed action". Also, amphibians in general were not surveyed, which is now a requirement of the current antimycin protocol, nor were beavers considered a potential nontarget species even though they inhabit the water in the project area.

Fails to mention the Chiricahua leopard frog, bald eagle, southwest willow flycatcher, spotted bat, and Arizona toad as potential nontarget threatened or endangered species, even though they are mentioned in the draft EA.

Fails to describe the wide array of potential environmental consequences, and the uncertainty surrounding the ability to make such determinations.

States live-cars will be located 100 meters below the detoxification station, although the current protocol calls for the live-cars to be placed 200 meters downstream.

Appendix D contains out-of-date antimycin protocol. See Exhibit 24 for correct one.

States that speckled dace removed prior to deployment will be held in plastic buckets, where the draft EA says they will be held in net enclosures in off-channel aquatic habitats.

Restocking of speckled dace is planned for as soon as 5 hours after completion of Fintrol deployment. This violates the Use Direction Leaflet, which states that fish may be restocked only after test fish survive for 48 hours in treated water.

Misrepresents "affected water" by not taking into account the downstream flow of deployed chemicals past the detoxification station, those which are not neutralized by potassium permanganate or the downstream dissemination of potassium permanganate itself.

Pre-treatment fish survey is 7-8 years old and out-of-date. Lacks pre-treatment surveys for water quality and other species.

States that antimycin is applied at 12 ppb, when the label states that the correct dose for trout is 5-10 ppb.

Describes the project area as remote (15-23 miles from nearest trailhead), yet article in Appendix C describes the trail crossing of White creek, a short distance upstream from the barrier, to be a popular destination for hikers and riders. Furthermore, the accompanying map shows a trail within 1-2 kilometers paralleling the main steam of the upper West Fork of the Gila River.

Claims antimycin removes 100% of fish in a stream, even though according to the draft EA, the project calls for at least 2 or 3 applications of Fintrol because a single application usually does *not* kill all the fish.

DEFICIENCIES IN THE ANTIMYCIN DEPLOYMENT PROTOCOL

The most up-to-date New Mexico Department of Game & Fish Protocol for Deployment of Antimycin A during Restoration of Native Fishers in Lotic Waters is dated March, 2002. The following deficiencies or problems are noted:

Inadequate pre-treatment surveys of the aquatic and riparian community, i.e., lack of data on microorganisms, reptiles, mammals, birds, plants, and other potential nontarget species.

No pre-treatment chemical analysis of the water (except pH), such as assessment of iron levels which can affect antimycin efficacy.

No post-treatment monitoring of water -- for at least acetone, manganese, diethyl phthalate and nonoxyl-9, and possibly sodium fluorescein.

No post-treatment monitoring of amphibians.

No post-treatment monitoring for organisms not included in the pre-treatment surveys.

Insufficient downstream monitoring in general.

No requirement to measure stream pH and temperature immediately before deployment.

No established method to convert “cfs” stream flow into “acre-feet” (required to follow Fintrol label).

Only lists the use of gloves and eyewear for protective equipment when the MSDS requires a full-face respirator with an organic vapor cartridge.

Lacks protocol for disposal of dead fish.

Backpack spraying is mentioned but there is no protocol for its use, including the concentration to be used, how and when it is to be applied, the equipment to be used including nozzle size and adjustment, wind precautions, and adequate personal protective equipment.

No method to determine whether excessive antimycin has been deployed.

No method to determine whether fish dying downstream of the potassium permanganate station are dying from unneutralized antimycin or excess potassium permanganate.

No requirement for there to be at least one person continuously monitoring each antimycin drip station.

VIOLATIONS OF LAWS, STANDARDS, OR AGREEMENTS

The currently proposed project violates the following laws and standards:

Endangered Species Act (ESA): The petition does not contain a Section 7 consultation or "biological opinion" from the U.S. Fish & Wildlife Service regarding the presence of the federally-listed Chiricahua leopard frog in the project area. Nor has a permit been obtained for an "incidental taking"of this species. The issuance of such a permit must await the designation of "critical habitat" and creation of a "recovery plan" for the Chiricahua leopard frog. Neither of these has been done and is not likely to be completed for several years.

The Wilderness Act: As above, deploying poison in a wilderness area is inconsistent with the Act's legal mandate to preserve wilderness areas in a condition that is "untrammeled" by man.

The Federal Insecticide, Rodenticide, and Fungicide Act (FIFRA): The proposed application of Fintrol violates FIFRA for not complying with label instructions. This includes allowing wildlife to drink treated water, deploying concentrations greater than label recommendations, restocking fish in less than 48 hours following deployment, and not complying with the label definition of "treated" waters. It would also be a violation if fingerling trout are not used in the live-car assays.

The Federal Clean Water Act: Deployment of Fintrol into the upper West Fork Gila River drainage constitutes a point source discharge pollutant into navigable waters of the U.S. and, therefore, requires a National Pollutant Discharge Elimination System (NPDES) permit prior to deployment (Exhibit 25). Failure of the EPA to supply one does not protect the applicator from liability under the Federal Clean Water Act and lawsuits brought by private entities (Exhibit 26).

Section 20.6.4.12.F of the New Mexico Standards for Interstate and Intrastate Surface Waters: This section requires post-treatment water monitoring by anyone granted a permit by the Water Quality Control Commission to apply a piscicide in New Mexico waters (Exhibit 27). Such monitoring is not included in the project proposal.

National Wild and Scenic Rivers Act: A "wild" river, as defined by the national wild and scenic rivers system, is "a river or section of river that is free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and *waters unpolluted*" (29). In a 1999 settlement agreement with the Center for Biological Diversity and Amigos Bravos, the Gila National Forest agreed to protect forest rivers, including the West Fork of the Gila River, while they undergo further study regarding their eligibility for designation under the Wild and Scenic Rivers Acts. Contaminating this river with a poison would pollute its waters and violate the settlement agreement.

BIOLOGICAL SANITY OR INSANITY?

In 1975, George Becker, a professor of zoology at the University of Wisconsin at Stevens Point, wrote an article entitled "Fish Toxification: Biological Sanity or Insanity?" (Exhibit 28). He expressed concern about potential adverse effects on nontarget organisms, especially threatened and endangered species, the fact that some creeks appeared sterile many years after a fish toxicant was applied, and the general lack of knowledge about the full range of potential environmental consequences resulting from the use of fish toxicants.

To address some of these concerns the Governor of Wisconsin convened a Study Committee on the Use of Toxicants for Fish Management. In its 1972 "Policy Statement on the Use of Toxicants in Management of Aquatic Resources", it states that pre-operational surveys of sufficient scope and duration must be conducted at carefully selected stations to yield baseline data on kinds of abundance of *aquatic flora, aquatic invertebrates, fish, amphibians, reptiles, waterfowl, and mammals*". It also calls for the "scientific documentation of short and long term detrimental effects to nontarget species (of fish toxicants). This would include sublethal effects such as sterilization and decreased ability to survive stress," as well as a "detailed investigation of the harmful effects of toxicant degradation products … '. It is inexcusable that after 30 years of antimycin use, neither comprehensive pre- and post-deployment surveys nor adequate toxilogical research have been or are being done.

CONCLUSION

This petition proposes to put toxic chemicals into the upper West Fork Gila River drainage, despite the fact that not all the ingredients in the Fintrol product are known, the toxicity of the individual chemicals is significant, much toxicity data for antimycin A is lacking, and the toxicity and environmental fate of using these chemicals in combination is unknown. Common usage does not substitute for scientific evaluation. Many

pesticides, such as DDT and chlordane, were once widely used until they were studied more thoroughly. Only then were they found to be more hazardous than originally thought and taken off the market.

It is wishful thinking to think that the chemicals in Fintrol can be controlled. Even the NM Department of Game and Fish admits that they have experienced unintentional fish kills in excess of four miles below an antimycin treatment (30). There is bound to be damage to non-target plants, animals, and microorganisms, both in the treatment area and downstream, even if the chemicals are deployed as planned. There is also an unacceptably high risk of accidents, spills, and misapplications.

Once toxic chemicals are put into the environment they tend to have a life of their own. They can spread far and wide. They do not just go away. They travel, break down to other toxic compounds, and can pollute air, food, water, and land distances from where they originated. For example the herbicide 2,4-D has been found in rainwater in Canada at levels that could harm plants (31) and pesticides applied in Africa can be detected in Florida.

Regrettably, the fish management community has a long history of using many kinds of toxic chemicals to kill fish. This includes *toxaphene* and *endrin* (32), cancer-causing pesticides on the "Dirty Dozen" list of persistent organic pollutants currently being considered for an international ban (33), *cyanide* (32), which is used in human executions, *pentachlorophenol* (32), a highly toxic, persistent, and cancer-causing wood preservative, and a variety of other insecticidal nerve poisons (32), including *DDT*. Unfortunately, using yet another poison, especially one with as many unknown toxic effects as antimycin, just repeats these past mistakes rather than learning from them.

The significant loss native fish populations is yet another signal that the environment has been seriously degraded. It does not make sense to further degrade the environment with toxic chemicals in an effort to restore the Gila trout. We need to find a win-win solution where the entire ecosystem, as well as native fish, are nurtured and protected. Less-toxic fish restoration techniques, even if more expensive and labor intensive, must be researched, developed, and utilized.

In the meantime, less toxic steps can be taken to help protect Gila trout in the upper West Fork Gila drainage. These include removing as many non-native fish as possible with nets or electrofishing (especially during low flow times) and stocking with Gila trout. This would give Gila trout a competitive edge over non-native trout. Even though the result would not be a 100% population of "pure" Gila trout, it would substantially increase the population size and range of this endangered species and help preserve historic Gila trout genes.

The use of Fintrol is ill-advised in almost all circumstances, but the proposal to use it in the upper West Fork Gila River drainage is particularly unacceptable due to its deployment the Gila Wilderness and the probable harm it would cause the federally-listed Chiricahua leopard frog.

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