UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF PREVENTION,
PESTICIDES AND
TOXIC SUBSTANCES

Chemical: Avitrol
PC Code: 069201
DP Barcode: D336322

MEMORANDUM

DATE: February 27, 2007

SUBJECT: Transmittal of the Environmental Fate and Effects Division's (EFED) Re-registration Science Chapter for the Ecological Risk Assessment of the Restricted Use Avicide, Avitrol

FROM: Lucy Shanaman, Chemist
Pamela Hurley, Senior Toxicologist
Environmental Risk Branch 3
Environmental Fate and Effects Division (7507P)

THRU: Daniel Rieder, Branch Chief
Environmental Risk Branch 3
Environmental Fate and Effects Division (7507P)

TO: Katie Hall
Reregistration Review Branch 2
Special Review Registration Division (7508P)

Attached please find the Environmental Fate and Effects Division's (EFED) environmental risk assessment for the proposed re-registration of Avitrol (4-aminopyridine), a restricted use avicide which is being marketed as a bird controlling agent with "flock alarming properties". This risk assessment covers: Avitrol Powder Mix (50% a.i.), Avitrol Concentrate (25% a.i.), Avitrol Mixed Grains (0.5% a.i.), Avitrol Corn Chops (0.5% a.i.), Avitrol Double Strength Corn Chops (1% a.i.), Avitrol Whole Corn (0.5% a.i.), and Avitrol Double Strength Whole Corn (1% a.i.).

Avitrol is packaged in two forms. As a powdered concentrate, bait such as bread cubes or French fries is added to a plastic bag containing Avitrol, and shaken until all visible powder is clinging to the bait. Avitrol is also available in pre-treated baits consisting of mixed grains and

either whole kernel or pelleted corn. After a period of baiting with untreated bait, treated bait is added to the untreated bait. Individual birds consuming the treated bait will react with loud cries and erratic flapping of their wings, which is intended to frighten away the remainder of the flock. When used as a frightening agent, Avitrol will always cause some mortality[1].

Avitrol is registered for use on crows, pigeons, grackles, starlings, cowbirds, gulls, and blackbirds in and around structures, feed lots, airports, land fill sites, and in California for protecting vineyards and sprouting agricultural seeds. Both federal and state permits are required whenever gulls are the target species for Avitrol. The state of California allows the use of Avitrol on ripening grapes and sprouting agricultural seeds with the requirement that bait trays must be used. The state of New York requires that a technician be monitoring Avitrol treated whenever it is placed in areas that are accessible to humans, pets, and non-target species. The national labels require that, when baiting at ground level, unconsumed treated bait be removed at nightfall to prevent exposure to non-target species. In most cases, the labels advise the user to bury any dead birds that are found. Non-agricultural use sites include: buildings, feed lots, sanitary land fills, airports, along with avian nesting, loafing and roosting sites. Labels outline recommended ranges for ratios of treated to untreated bait. When Avitrol is used to protect sprouting seeds at California agricultural fields, one bait tray, of unspecified dimensions, holding about 5 pounds of treated seed mixture is recommended for every 5 to 15 acres. Application rates for other use sites are unspecified in terms of pounds of active ingredient and/or treated bait per acre.

The risk conclusions can be found in the Executive Summary of the risk assessment.

Suggestions for Hazard Labeling

Environmental Hazards

Manufacturing Use: This pesticide is toxic to wildlife. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA. Do not contaminate water when disposing of equipment washwaters.

End Use Products: In general, current Environmental Hazard Labeling for the End Use Products is appropriate. The labels should also reflect that the products are toxic to mammals and extremely toxic to birds based on the submitted incident data.

Statement to minimize the potential for surface water contamination for all end-use products: The current label statements intended to minimize the potential for surface water contamination are appropriate.

1 http://www.avitrol.com/Training/index.php

Statements to minimize risks to endangered/threatened species: All of the labels already have consistent statements concerning minimizing risk to endangered/threatened species; however, there are significant uncertainties associated with the risks to non-target species due to lack of specific labeling for the registered Avitrol uses. The labels are very general and allow for considerable leeway on the part of the user. More specific instructions for the various target species on recommended quantities of active ingredient distributed per unit area, bait placement locations, monitoring and timing and duration of exposure may be appropriate. Additional measures to further minimize risks would include the following suggestions:

- Federal Migratory Bird Permit: The labels use common names for the target birds. In order to avoid confusion, specific names could be listed, including the latin names because the generic names for the birds can denote numerous species. For example, the labels specify pigeons as a target species. There are numerous pigeons listed in the Migratory Bird Treaty Act[2]. The label is probably targeting rock doves (*Columba livia*), which are the "pigeons" usually referred to in urban areas. Rock doves are not on the Migratory Bird Treaty Act list. Both house finches (*Carpodacus mexicanus*) and house sparrows (*Passer domesticus*) are Avitrol-labeled target birds. House finches are on the Migratory Bird Treaty Act list but house sparrows are not on the list. Crowned sparrows are listed as target birds on one label; however, there are several types of crowned sparrows. In addition, starlings are target birds on labels, but it is not specified as to which starlings (likely the European starling *Sturnus vulgaris*). The birds listed below are those that could be Avitrol-labeled target birds *and* are on the Migratory Bird Treaty Act list. If any of these birds are meant to be the target birds on the Avitrol labels, then a Federal Migratory Bird Permit would be required. Landowners or wildlife management agencies seeking to control any of the nuisance bird species that are on the Migratory Bird Treaty Act list using Avitrol products must contact the U.S. Fish and Wildlife Service Migratory Bird Permit Office responsible for the region where the birds are located for a federal permit before bait is dispensed. Permit application forms and contact information are available at http://www.fws.gov/forms/3-200-13.pdf. Once it has been determined that no additional authorization (e.g., for take of threatened and endangered species) will be required, allow 90 days for processing of a complete application. The permit applicant must also identify the Certified Applicator who will apply the bait.

Blackbird: Brewer's (*Euphagus cyanocephalus*), Red-winged (*Agelaius phoeniceus*), Rusty (*Euphagus carolinus*), Yellow-headed (*Xanthocephalus xanthocephalus*)
Pigeon: Band-tailed (*Columba fasciata*), Plain (*Columba inornata*), Red-billed (*Columba flavirostris*), Scaly-naped (*Columba squamosa*), White-crowned (*Columba leucocephala*)
Starling: Ashy (*Sturnus cineraceus*),Violet-backed (*Sturnus philippensis*)
Grackle: Boat-tailed (*Quiscalus major*), Common (*Quiscalus quiscula*), Great-tailed (*Quiscalus mexicanus*), Greater Antillean (*Quiscalus niger*)
Cowbird: Bronzed (*Molothrus aeneus*), Brown-headed (*Molothrus ater*), Shiny (*Molothrus*

2 http://www.fws.gov/migratorybirds/intrnltr/mbta/mbtandx.html

bonariensis)
Finch: House (*Carpodacus mexicanus*)
Gull: Black-headed (=Common Black-headed) (*Larus ridibundus*), Bonaparte's (*Larus Philadelphia*), California (*Larus californicus*), Common Black-headed (see Gull, Black-headed), Franklin's (*Larus pipixcan*), Glaucous (*Larus hyperboreus*), Glaucous-winged (*Larus glaucescens*), Great Black-backed (*Larus marinus*), Heermann's (*Larus heermanni*), Herring (*Larus argentatus*), Iceland (*Larus glaucoides*), Ivory (*Pagophila eburnean*), Laughing (*Larus atricilla*), Lesser Black-headed (*Larus fuscus*), Little (*Larus minutus*), Mew (*Larus canus*), Ring-billed (*Larus delawarensis*), Ross' (*Rhodostethia rosea*), Sabine's (*Xema sabini*), Slaty-backed (*Larus schistisagus*), Thayer's (*Larus thayeri*), Western (*Larus occidentalis*), Yellow-footed (*Larus livens*)
Crow: American (*Corvus brachyrhynchos*), Fish (*Corvus ossifragus*), Hawaiian (*Corvus hawaiiensis*), Mexican (*Corvus imparatus*), Northwestern (*Corvus caurinus*), White-necked (*Corvus leucognaphalus*)
Lark: Horned (*Eremophila alpestris*)
Sparrow: Golden-crowned (*Zonotrichia atricapilla*), Rufous-crowned (*Aimophila ruficeps*), White-crowned (*Zonotrichia leucophrys*)

- The current labels state: "Avitrol must not be exposed in any manner that may endanger desirable and protected bird species. If there is a question of such hazard, consult local, state and federal game authorities before undertaking bird management with Avitrol." This language is not based on a biological opinion. It is suggested that prior to undertaking bird management controls using Avitrol baits, local state and federal game authorities be consulted to determine whether or not Listed species occur in the proposed use area and if they do occur, the consult should include an agreement as to how Avitrol may be used without harming any protected species.
- Airport use: Airports are required to follow strict federal regulations. It would therefore be appropriate to only include those land airports holding FAA certifications under 14 Code of Federal Regulations 130.101 and a wildlife hazard management plan under 14 Code of Federal Regulations 139.337.
- Timing and duration: Birds tend to have their heavy feeding at the first feeding of the morning. Having a time limit of only a few hours early in the morning for placement of the treated baits may significantly reduce exposure for non-target species. The baits could either be removed or replaced with untreated baits after the exposure period. Dead birds could be removed at that time as well and disposed with appropriate methods.
- Monitoring the bait: In areas where non-target species are likely to be present in higher numbers, a technician could remain on site following administration of the treated bait to ensure that protected species (particularly migrating species) do not come in contact with the treated blend and if possible, that predatory birds do not come in contact with dead and dying birds. To minimize the time required for the technician to remain on site, it is again suggested that Avitrol baits be placed early in the morning and then either removed or replaced with untreated baits after a few hours when the technician leaves the premises. The technician could also remove dead birds upon leaving the premises.
- Monitoring for dead birds: To minimize risks to predatory species, if the baits are not removed after several hours, the baited areas could be monitored at regular intervals

throughout the day and dead birds could be picked up and disposed of by an appropriate method.

- Use of bait trays and placement of bait: Avitrol formulations could be placed in bait trays with lips on the trays to minimize spills or on paved surfaces to provide for more efficient cleanup and to minimize additional exposure to non-target species. In urban areas, when practical, the baits could be placed in elevated, protected areas (for example, where the target birds roost) to minimize open exposure to other species.
- Removal of bait: The labels could emphasize that the treated baits need to be removed and/or cleaned up daily following treatment to minimize exposure to nocturnal species.
- Documentation of feeding habits: Where the labels state that careful observations of the birds' feeding habits must be made to establish proper feeding locations and to determine that no non-target birds are feeding on the pre-bait, the label could state that these are direct observations, ensured by the applicator, technician or another person in charge of the application.
- Minimization of mortality (use only on most highly responsive species): Avitrol is advertised as a pesticide with flock alarming properties. This pesticide is supposed to scare away flocks of nuisance birds with minimal mortality. In a response from the Registrant concerning flock mortality[3], it is noted that certain species are not only very good reactors (blackbirds, grackles, cowbirds, crows and sea gulls) but also are very responsive to the reactions of the flock. These species can usually be controlled with minimum mortality. Other birds may be good reactors but are less responsive to the reactions of the remainder of the flock (starlings). These birds would have higher mortality. Finally, feral pigeons and house sparrows are not very good reactors and do not respond very well to the reactions of other members of the flock. Mortality would be the highest with these flocks. It is suggested that the use of Avitrol be revisited as to its usefulness for flocks such as starlings, pigeons and particularly house sparrows, which, according to the Registrant can have a mortality of up to 50%.
- One of the major deficiencies and uncertainties in the current labels are the lack of limits to how much can be distributed in a given area. It is recognized that these are not typical products that are applied on a "per acre" basis. However, to avoid inadvertent application of amounts more than that which is needed, just to kill a few individuals for the purpose of scaring away the majority of the flock, the labels could specify an upper bound of active ingredient that can be applied on a specified unit of area. A maximum amount of active ingredient per square foot, square meter, acre or hectare would at least make it clear to users the amounts that they should not exceed. It would also provide better information upon which to base a refined endangered species assessment. As the labels are worded now, except for the agricultural uses, there are no limits on how much can be used. The more that is used, the greater the chance of non-target and secondary exposure, potential for population impacts to non-target species and probability of exposure to endangered species.

3 Response to questions posed by the review team to the Registrant. Dated, January 23, 2007.

Data Gaps

The available environmental fate data on 4-aminopyridine are generally supplemental information. However, after perusing the readily available open literature and structural analysis sources of information, EFED expects Avitrol to be both mobile and persistent in the open environment. No data concerning any possible transformation/degradation properties of Avitrol are available. Without acceptable, core chemical and environmental fate data submitted to the Agency, a great deal of uncertainty exists concerning the environmental fate of Avitrol.

The available ecotoxicity data on 4-aminopyridine are also generally supplemental information. As a result, it was not possible to conduct a quantitative assessment of risk; however, the data are sufficient to allow for a description of potential hazard and risk.

Environmental Fate and Effects

TABLE A-1: of Environmental Fate Data Requirements

Guideline #	Data Requirement (material)	MRID #	Study Classification	Are more data needed?
161-1	Hydrolysis	—	—	Yes
161-2	Photodegradation in Water	—	—	Yes
161-3	Photodegradation on Soil	—	—	Yes
161-4	Photodegradation in Air	—	—	No
162-1	Aerobic Soil Metabolism	05003185 0109579	Supplemental Supplemental	Yes
162-2	Anaerobic Soil Metabolism	05003185	Supplemental	Yes
162-3	Anaerobic Aquatic Metabolism (benthic)	—	—	No**
162-4	Aerobic Aquatic Metabolism	—	—	Yes
163-1	Leaching-Adsorption/Desorption	05003185	Unacceptable	Yes
163-2	Laboratory Volatility	—	—	No
163-3	Field Volatility	—	—	No
164-1	Terrestrial Field Dissipation	—	—	No*
164-2	Aquatic Field Dissipation	—	—	No
164-3	Forestry Dissipation	—	—	No
165-4	Accumulation in Fish		—	No**
165-5	Accumulation- aquatic non-target	—	—	No
166-1	Ground Water- small prospective	—	—	No
166-2	Groundwater – small retrospective	—	—	No

TABLE A-1: of Environmental Fate Data Requirements				
Guideline #	**Data Requirement (material)**	**MRID #**	**Study Classification**	**Are more data needed?**
201-1	Droplet Size Spectrum	—	—	No
202-1	Drift Field Evaluation	—	—	No

* based upon the assumption that application rates will be low, and that an entire drainage area will not be treated
** based upon modeled mobility value, Avitrol is not expected to partition appreciably into sediment/fatty tissues

Ecological Toxicity Data

TABLE A-2: Ecological Toxicity Data Requirements				
Guideline #	**Data Requirement**	**MRID #**	**Classification**	**Are more data needed?**
71-1	Avian acute oral LD_{50} (bobwhite quail)	00004083, 00003985, 00004101	Supplemental	No – Although studies not individually acceptable, data are sufficient as a group for a description of risk. Requiring new data would not add sufficient value to assessment of risk.
	(mallard duck)	00160000, 00147985	Supplemental	
71-2	Avian subacute dietary LC_{50} (mallard duck)	00147985	Supplemental	
	(mourning dove)	00004083, 00003985, 00004101	Supplemental	
71-4	Avian reproduction Coturnix quail	05003186	Supplemental	
72-1	Freshwater fish acute LC_{50} (channel catfish)	00004083, 00003985, 00004101	Supplemental	No – Although the current studies are not acceptable, the high dilution rate of bait would not allow sufficient a.i. to be applied in a single drainage area to affect aquatic animals, even if toxicity values or exposure estimates are off by an order of magnitude. Requiring new data would not add sufficient value to assessment of risk.
	(bluegill sunfish)			
72-2	Freshwater invertebrate acute EC_{50} (daphnia)	ECOTOX Ref. # 7412	Supplemental	
	(juvenile glass shrimp)			
72-3a	Estuarine/marine fish acute LC_{50}	00004111	Supplemental	
	(cowfish)			
	(globe fish)			
72-3b	Estuarine/marine invertebrate acute EC_{50}	N/A	No data available	

TABLE A-2: Ecological Toxicity Data Requirements				
Guideline #	**Data Requirement**	**MRID #**	**Classification**	**Are more data needed?**
	(pacific oyster) (mysid shrimp)			
72-4a	Freshwater fish early life stage (fathead minnow)	N/A	No data available	No – Although chronic studies are not available, use patterns are such that it is unlikely that sufficient amounts will be consistently available in the aquatic environment to generate significant chronic exposure.
72-4b	Freshwater invertebrate life cycle (daphnia)	N/A	No data available	
72-4c	Estuarine/marine life cycle (mysid)	N/A	No data available	
72-5	Freshwater fish life cycle (fathead minnow)	N/A	No data available	
72-7	Aquatic Field Study	N/A	No data available	No
81-1	Acute mammalian oral LD_{50} (rat) (dog)	00004024	Acceptable	No
83-4	Mammalian Reproduction (rat)	N/A	No data available	No - Requiring new data would not add sufficient value to assessment of risk. Available reproduction data in birds indicates potentially low reproductive hazard. It is more likely that acute exposure will result in mortality with minimal opportunities for chronic exposure.
123-1(a)	Seedling Emergence	00004124 00004037	Supplemental	No - Requiring new data would not add sufficient value to assessment of risk. Current use patterns along with available toxicity data indicate that impacts to large terrestrial plant populations likely low, although there may be risk to individual plants adjacent to the baits if there are repeated rain events with repeated replacement of the baits.
123-1(b)	Vegetative Vigor	00004124 00004037	Supplemental	

TABLE A-2: Ecological Toxicity Data Requirements				
Guideline #	**Data Requirement**	**MRID #**	**Classification**	**Are more data needed?**
122-2	Aquatic plant algae *Selenastrum capricornutum*	N/A	No data available	No – Use patterns are such that it is unlikely that sufficient amounts will get into aquatic environment to generate risk.
123-2	Aquatic plant acute EC_{50} *Lemna gibba*	N/A	No data available	
141-1	Acute honey bee contact LD_{50} Acute honey bee 5-day oral LD_{50}	N/A	No data available	No - Based on the use patterns, the risk to populations is likely to be low.
141-2	Honey Bee Residue on Foliage	N/A	No data available	