United States Environmental Protection Agency

Office of Prevention, Pesticides and Toxic Substances (7501C)

Pesticide Fact Sheet

Name of Chemical: Flumioxazin
Reason for Issuance: Conditional Registration
Date Issued: April 12, 2001

1. DESCRIPTION OF CHEMICAL

Generic Name:	2-[7-fluoro-3,4-dihydro-3-oxo-4-(2-propynyl)-2*H*-1, 4-benzoxazin-6-yl]-4,5,6,7-tetrahydro-1H-isoindole-1,3(2H)-dione
Common Name:	Flumioxazin
Trade Name:	Valor WDG Herbicide
EPA Shaughnessy Code:	129034
Chemical Abstracts Service (CAS) Number:	103361-09-7
Year of Initial Registration:	2001
Pesticide Type:	Herbicide
Chemical Family:	N-phenylphthalimide
U.S. Producer:	Valent U.S.A. Corporation

2. USE PATTERNS AND FORMULATIONS

Application Sites:	Flumioxazin is registered for use on soybeans and peanuts.
Types of Formulations:	97.9% technical product 51% emulsifiable concentrate end-use product

Types and Methods of Application:	Ground application using standard commercial sprayers
Application Rates:	Application rates 2 to 3 ounces of formulated product (0.064 to 0.096 pounds active ingredient acid equivalent) per acre. One application is allowed per season.
Carrier:	Water

3. SCIENCE FINDINGS

Summary Science Statements

Based upon a battery of acute toxicity studies, Valor WDG Herbicide is classified as Toxicity Category III. Flumioxazin is classified as a "not likely" human carcinogen. There is increased susceptibility of rats (but not rabbits) to *in utero* and postnatal exposure to flumioxazin, and the FQPA 10X Safety Factor has been retained. The data available at this time indicate that flumioxazin is highly phytotoxic; however, it is unlikely that flumioxazin will pose a risk of acute or chronic toxicity to non-target animals. Flumioxazin is relatively unstable and its potential to leach to groundwater is low. Potential for the degradation products to leach to groundwater is high.

Chemical Characteristics

Property	Technical	End-use
Physical State	Solid	Solid
Color	Yellowish-Brown	Light Brown
Odor	Odorless	Slight
Melting Point	202-204 C	N/A
Density	1.51 g/mL @ 20 C	41.4 lbs./cu. ft.
Solubility (Water)	1.79 mg/L at 25 C	N/A
Vapor Pressure	2.41×10^{-6} mm Hg	N/A
Octanol/Water Partition Coefficient	Log K_{ow} = 2.55 @ 20 C	N/A
pH	7.29 @ 25 C	6.2 - 6.4 @ 20 C

Toxicology Characteristics

Acute Toxicity of Flumioxazin Technical			
Guideline No.	**Study Type**	**Results**	**Toxicity Category**
870.1000	Acute Oral - rat	LD_{50}>5000 mg/kg; no clinical signs	IV
870.1100	Acute Dermal - rat	LD_{50}>2000 mg/kg; no clinical signs	III
870.1200	Acute Inhalation - rat	LC_{50} = 3.93 mg/L	IV
870.2400	Primary Eye Irritation - rabbit	No corneal irritation; mild irritation of iris cleared by 24 hours; mild irritation of conjunctivae cleared by 48 hours	III
870.2500	Primary Skin Irritation - rabbit	No erythema or edema	IV
870.2600	Dermal sensitization - guinea pig	Not a dermal sensitizer	N/A

Acute Toxicity of Valor WDG Herbicide			
Guideline No.	**Study Type**	**Results**	**Toxicity Category**
870.1000	Acute Oral - rat	LD_{50}>5000 mg/kg; no clinical signs	IV
870.1100	Acute Dermal - rat	LD_{50}>2000 mg/kg; no clinical signs	III
870.1200	Acute Inhalation - rat	LC_{50} > 0.969 mg/L	III
870.2400	Primary Eye Irritation - rabbit	No corneal or irridial irritation; mild irritation of conjunctivae cleared by 48 hours	III
870.2500	Primary Skin Irritation - rabbit	Mild or slight irritation at 72 hours	IV
870.2600	Dermal sensitization - guinea pig	Not a dermal sensitizer	N/A

Subchronic, Chronic, and Other Toxicity	
Guideline No./ Study Type	**Results**
870.3100 90-Day oral toxicity - rat	NOAEL = mg/kg/day: 69.7 (M), 71.5 (F) LOAEL = mg/kg/day: 243.5 (M), 229.6 (F) based on a decrease in MCV both sexes; increase in platelets F only
870.3100 90-Day oral toxicity - rat	NOAEL = mg/kg/day: 65.0 (M), 72.9 (F) LOAEL = mg/kg/day: 196.7 (M), 218.4 (F) based on hematology changes
870.3150 90-Day capsule - dog	NOAEL = mg/kg/day: 10 (M & F) LOAEL = mg/kg/day: 100 (M & F) based on dose dependent increase in total cholesterol, phospholipid & alkaline phosphatase
870.3100 90-Day oral toxicity - mouse	NOAEL = mg/kg/day: 429 (M & F) LOAEL = mg/kg/day: 1429 (M & F) based on increased liver weight in males
870. 3100 4-Week oral toxicity - mouse	NOAEL = mg/kg/day: 151.5 (M), 164.5 (F) LOAEL = mg/kg/day: 419.9 (M), 481.6 (F) based on increased absolute &/or relative liver weights in M & F
870.3200 21-Day dermal toxicity - rat	NOAEL = mg/kg/day: 1000 (LIMIT DOSE) LOAEL = mg/kg/day: >1000 based on no effects
870.3700a Prenatal developmental - rat **(oral)**	**Maternal** NOAEL = 30 mg/kg/day (HDT) LOAEL = >30 mg/kg/day (HDT) **Developmental** NOAEL = 3 mg/kg/day LOAEL = 10 mg/kg/day based on cardiovascular effects (especially ventricular septal defects)
870.3700a Prenatal developmental - rat **(dermal)**	**Maternal** NOAEL = 300 mg/kg/day (HDT) LOAEL = >300 mg/kg/day (HDT) **Developmental** NOAEL = 30 mg/kg/day LOAEL = 100 mg/kg/day based on cardiovascular effects (especially ventricular septal defects)
870.3700b Prenatal developmental - rabbit **(oral)**	**Maternal** NOAEL = 1000 mg/kg/day LOAEL = 3000 mg/kg/day (HDT) based on decrease in body weight and food consumption during dosing **Developmental** NOAEL = 3000 mg/kg/day (HDT) LOAEL = >3000 mg/kg/day

Subchronic, Chronic, and Other Toxicity	
Guideline No./ Study Type	**Results**
870.3800 Reproduction and fertility effects - rat	**Parental/Systemic** NOAEL = mg/kg/day: males = 12.7, females = 15.1 LOAEL = mg/kg/day: males = 18.9, females = 22.7 based on increase in clinical signs (red substance in vagina) and increased female mortality as well as decreased body weight, body weight gain and food consumption **Reproductive** NOAEL = mg/kg/day: males = 18.9 (HDT), females = 22.7 (HDT) LOAEL = mg/kg/day: males = >18.9 (HDT), females = >22.7 (HDT) **Offspring** NOAEL = mg/kg/day: males = 6.3, females = 7.6 LOAEL = mg/kg/day: males = 12.7, females = 15.1 based on a decrease in the number of liveborn and a decrease in pup body weight
870.4100 12-Month capsule - dog	NOAEL = 100 mg/kg/day (M & F) LOAEL = 1000 mg/kg/day (M &F), (LIMIT DOSE) based on the following for males and females: increased absolute and relative liver weights; 300% increase in alkaline phosphatase values
870.4200 Carcinogenicity - mouse	NOAEL = mg/kg/day: males = 754.1, females = 859.1 (LIMIT DOSE) LOAEL = no systemic effects at LIMIT DOSE in males or females **No evidence of carcinogenicity**
870.4300 Combined chronic carcinogenicity - rat	NOAEL = mg/kg/day: males = 1.8, females = 2.2 LOAEL = mg/kg/day: males = 18.0, females = 21.8 based on increased chronic nephropathy in males and decreased hematological parameters in females (Hgb, MCV, MCH and MCHC) **No evidence of carcinogenicity**
870.5100 Gene mutation in *S. typhimurium* and *E. coli*	Neither cytotoxic nor mutagenic up to 2000 g/plate. There were reproducible increases in revertant colonies of *S. typhimurium* strains TA1538 and TA98 in S9 activated phases of the preliminary cytotoxicity and both mutation assays. [Results considered to be equivocal.]

Subchronic, Chronic, and Other Toxicity	
Guideline No./ Study Type	**Results**
870.5375 Gene mutation in chinese hamster ovary cells	Precipitation at 200 M. Cytotoxicity at 500 M. Positive +S9 100 M and negative at 30-500 M -S9. Aberrations were chromatid breaks and exchanges.
870.5395 *In vivo* rat bone marrow	Negative in male (up to 5000 mg/kg) and female rats (up to 4400 mg/kg) when tested orally.
870.5550 UDS assay	Negative up to 5000 mg/kg.
870.7485 Metabolism and pharmacokinetics - rat (oral)	Gastrointestinal tract absorption >90% at 1 mg/kg and up to 50% at 100 mg/kg. At least 97% recovery in feces and urine 7 days after dosing. Highest levels of residues (36-49 ppb) in blood cells at low dose and 2800-3000 ppg at high dose (RBC levels > plasma). In addition to untransformed parent, 7 metabolites identified in urine and feces (38-46% for low dose and about 71% at high dose).
870.7600 Dermal penetration - rat	Males dosed with suspension of 50 WDG formulation in water at 0.02, 0.20 or 1.0 mg/rat (0.002, 0.020 or 0.100 cm^2. At 0.02 mg/rat, absorption ranged from 0.48% at 0.5 hours to 5.46% at 24 hours. At 0.2 mg/rat, absorption ranged from 0.007% at 0.5 hours to 0.74% at 24 hours. At 1.0 mg/rat, absorption ranged from 0.004% at 0.5 hours to 10.47% at 24 hours.
870.7600 Dermal penetration - rat	Females dosed with 200 or 800 mg/kg b.w. Dermal absorption for 200 and 800 mg/kg was 3.9 and 8.0% by 48 hours after initiation of treatment for 6 hours. Blood levels at 6-24 hours after dermal dosing with 200 mg/kg were similar to those obtained at 2-6 hours after oral dosing with 1 mg/kg. Blood levels at 6-24 hours after dermal dosing with 800 mg/kg were similar to those obtained at 2-6 hours after oral dosing with 30 mg/kg.
870.XXX Special Study - Rat Developmental: Critical Time for Defects	Pregnant females were administered 400 mg/kg by gavage on gestation day 11 or 12 or 13 or 14 or 15. Day 12 administration showed: largest incidence of embryonic death, lowest fetal body weights and greatest incidence of ventricular spetal defects.

Toxicological Endpoints

The dose at which no adverse effects are observed (the NOAEL) from the toxicology study identified as appropriate for use in risk assessment is used to estimate the toxicological level of concern (LOC). However, the lowest dose at which adverse effects of concern are identified (the LOAEL) is sometimes used for risk assessment if no NOAEL was achieved in the toxicology study selected. An uncertainty factor (UF) is applied to reflect uncertainties inherent in the extrapolation from laboratory animal data to humans and in the variations in sensitivity among members of the human population as well as other unknowns. An UF of 100 is routinely used, 10X to account for interspecies differences and 10X for intra species differences.

For dietary risk assessment (other than cancer) the Agency uses the UF to calculate an acute or chronic reference dose (acute RfD or chronic RfD) where the RfD is equal to the NOAEL divided by the appropriate UF (RfD = NOAEL/UF). Where an additional safety factor is retained due to concerns unique to the FQPA, this additional factor is applied to the RfD by dividing the RfD by such additional factor. The acute or chronic Population Adjusted Dose (aPAD or cPAD) is a modification of the RfD to accommodate this type of FQPA Safety Factor.

For non-dietary risk assessments (other than cancer) the UF is used to determine the LOC. For example, when 100 is the appropriate UF (10X to account for interspecies differences and 10X for intraspecies differences) the LOC is 100. To estimate risk, a ratio of the NOAEL to exposures (margin of exposure (MOE) = NOAEL/exposure) is calculated and compared to the LOC.

The linear default risk methodology (Q*) is the primary method currently used by the Agency to quantify carcinogenic risk. The Q* approach assumes that any amount of exposure will lead to some degree of cancer risk. A Q* is calculated and used to estimate risk which represents a probability of occurrence of additional cancer cases (e.g., risk is expressed as 1×10^{-6} or one in a million). Under certain specific circumstances, MOE calculations will be used for the carcinogenic risk assessment. In this non-linear approach, a "point of departure" is identified below which carcinogenic effects are not expected. The point of departure is typically a NOAEL based on an endpoint related to cancer effects though it may be a different value derived from the dose response curve. To estimate risk, a ratio of the point of departure to exposure (MOE_{cancer} = point of departure/exposures) is calculated.

The FQPA safety factor (as required by the Food Quality Protection Act of August 3, 1996) has been retained at 10x for all population subgroups for all exposure durations (acute and chronic) in assessing the risk posed by this chemical. The reasons for retaining the 10x safety factor are as follows. First, there is evidence of increased susceptibility of the rat fetuses to *in utero* exposure to flumioxazin by the oral and dermal route in the prenatal developmental toxicity studies in rats. In addition, there is evidence of increased susceptibility of young animals exposed to flumioxazin in the 2-generation reproduction toxicity study in rats. Finally, there is concern for the severity of the effects observed in fetuses and young animals when compared to those observed in the maternal and parental animals (dose- and treatment-related increase in the incidence of cardiovascular abnormalities, particularly ventricular septal defect, in the developmental studies; and decreases in

the number of live born pups and pup body weights in the absence of parental toxicity in the reproduction study).

A summary of the toxicological endpoints for flumioxazin used for human risk assessment is shown in the following table :

Toxicological Doses and Endpoints for Flumioxazin For Use in Human Risk Assessment			
Exposure Scenario	**Dose Used in Risk Assessment, UF**	**FQPA SF* and Level of Concern for Risk Assessment**	**Study and Toxicological Effects**
Acute Dietary Females 13-50	NOAEL = 3 mg/kg/day **Acute RfD** = 0.03 mg/kg/day	FQPA SF = 10 aPAD = acute RfD / FQPA SF = 0.003 mg/kg/day	**Oral developmental and supplemental prenatal studies in the rat** LOAEL = 10 mg/kg/day based on cardiovascular effects (especially ventricular septal defects in fetuses)
Acute Dietary General Population	An endpoint attributable to a single dose (exposure) was not identified from the available studies, including the developmental toxicity studies in rats and rabbits.		
Chronic Dietary all populations	NOAEL = 2 mg/kg/day UF = 100 **Chronic RfD =** 0.02 mg/kg/day	FQPA SF = 10 cPAD = chronic RfD / FQPA SF = 0.002 mg/kg/day	**2-Year Chronic/Carcinogenicity Study in the rat** LOAEL = 18 mg/kg/day based on increased chronic nephropathy in males and decreased hematological parameters in females (Hgb, MCV, MCH and MCHC)
Incidental Oral (short and intermediate term)	NOAEL = 65 mg/kg/day	Target MOE = 1000 (Residential)	**90-Day Toxicity Studies in the rat** LOAEL = 196.7 mg/kg/day based on hematology changes (decrease in MCVand increase in female platelets)

Toxicological Doses and Endpoints for Flumioxazin For Use in Human Risk Assessment			
Exposure Scenario	**Dose Used in Risk Assessment, UF**	**FQPA SF* and Level of Concern for Risk Assessment**	**Study and Toxicological Effects**
Dermal (all durations)	NOAEL = 30 mg/kg/day	Target MOE = 1000 (Residential)	**Dermal Developmental Study in the rat** LOAEL = 100 mg/kg/day based on cardiovascular effects (especially ventricular septal defects in fetuses)
Short-term Inhalation	NOAEL = 3 mg/kg/day	Target MOE = 1000 (Residential)	**Oral Developmental Study in the rat** LOAEL = 10 mg/kg/day based on cardiovascular effects (especially ventricular septal defects in fetuses)
Intermediate- and Long-term Inhalation	NOAEL = 2 mg/kg/day	Target MOE = 1000 (Residential)	**2-Year Chronic/Carcinogenicity Study in the rat** LOAEL = 18 mg/kg/day based on increased chronic nephropathy in males and decreased hematological parameters in females (Hgb, MCV, MCH and MCHC)
Cancer (oral, dermal, inhalation)	Not likely to be a carcinogen for humans based on the lack of carcinogenicity in a 2-year rat study, an 18-month mouse study and a battery of mutagenic studies.		

* The reference to the FQPA Safety Factor refers to any additional safety factor retained due to concerns unique to the FQPA.

Human Exposures and Risks

Acute risk

The acute dietary exposure from food to flumioxazin will occupy 0.72% of the aPAD for females 13 years and older. In addition, there is potential for acute dietary exposure to flumioxazin in drinking water. After calculating DWLOCs and comparing them to the EECs for surface and ground water, EPA does not expect the aggregate exposure to exceed 100% of the aPAD, as shown in the following table:

Aggregate Risk Assessment for Acute Exposure to Flumioxazin					
Population Subgroup	aPAD (mg/kg)	% aPAD (Food)	Surface Water EEC (ppb)	Ground Water EEC (ppb)	Acute DWLOC (ppb)
Females (13+ years)	0.003	0.72	2.4	6.3	90

Chronic risk

EPA has concluded that exposure to flumioxazin from food will utilize 0.5% of the cPAD for the U.S. population, 2.3% of the cPAD for all infants (< 1 year) and 1.2% of the cPAD for children (1 - 6 years). There are no residential uses for flumioxazin that result in chronic residential exposure to flumioxazin. In addition, there is potential for chronic dietary exposure to flumioxazin in drinking water. After calculating DWLOCs and comparing them to the EECs for surface and ground water, EPA does not expect the aggregate exposure to exceed 100% of the cPAD, as shown in the following table:

Aggregate Risk Assessment for Chronic (Non-Cancer) Exposure to Flumioxazin					
Population Subgroup	cPAD mg/kg/day	% cPAD (Food)	Surface Water EEC (ppb)	Ground Water EEC (ppb)	Chronic DWLOC (ppb)
U.S. Population	0.002	0.5	0.67	6.3	70
Infants (< 1 year)	0.002	2.3	0.67	6.3	20
Females (13+ years)	0.002	0.4	0.67	6.3	60
Males (13 - 19 years)	0.002	0.6	0.67	6.3	70

Occupational Risk

Use of flumioxazin may result in short and intermediate-term dermal and inhalation exposure during mixing, loading, applying and postapplication activities. Chronic exposures (6 months of continuous exposure) are not expected to occur. Based on the use patterns two major occupational handler exposure scenarios were identified for flumioxazin: (1.) mixing/loading dry flowable formulation for ground boom application and; (2.) applying as a spray with a tractor-drawn ground boom.

No chemical-specific data were submitted to the Agency in support of the occupational handler assessment for the flumioxazin. PHED V1.1 data were used to estimate dermal and inhalation exposure from flumioxazin applications. Since both the dermal and inhalation endpoints are based on the same toxicological effects (i.e., cardiovascular abnormalities), the route-specific Margin of Exposure (MOEs) were combined into a total MOE. The total target MOE (dermal + inhalation) is 100. MOEs greater than or equal to 100 do not exceed HED's level of concern. The short-term total MOEs ranged from 300 to 11,000 for handlers and the intermediate-term total MOEs ranged from 300 to10,000. HED performed a post-application assessment using standard values and transfer coefficients to determine daily exposure associated with postapplicaton activities. All MOEs for postapplication exposure calculated on day of application were greater than 100.

Based on the Worker Protection Standard (CFR 156.208), a 12-hour Restricted Entry Interval (REI) is acceptable (acute toxicity categories for flumioxazin are in III and IV).

Environmental Characteristics

STUDY TYPE	HALF LIFE/OTHER
Hydrolysis	4.2 days at pH 5; 1 day at pH 7; 0.01 days at pH 9
Photolysis in Water	1 day at pH 5
Photolysis on Soil	3.2 to 8.4 days (average 5.8 days)
Aerobic Soil Metabolism	11.9 to 17.5 days (average 14.7 days)
Anaerobic Aquatic Metabolism	0.2 days
Mobility-Unaged Leaching	Moderately mobile
Mobility-Aged Leaching	Generally not found below 3 inches of soil depth
Terrestrial Field Dissipation	**Shouldn't something go in here - data gap?**

Potential to Contaminate Groundwater

Available data indicate that flumioxazin is relatively unstable and its potential to leach to groundwater is low. However, the potential for the degradation products APF and THPA to leach to groundwater is high. The mobility of the major degradation product, 482-HA, detected in the hydrolysis and the unidentified residues detected in the aqueous photolysis and anaerobic aquatic metabolism studies are unknown. These residues may persist in the environment and may leach to groundwater. Flumioxazin could potentially reach surface water via spray drift or runoff under certain environmental conditions.

Ecological Characteristics

Terrestrial

Flumioxazin is practically non-toxic to the bobwhite quail on an acute basis (LD_{50} > 2250 mg/kg) and practically non-toxic to the mallard duck and the bobwhite quail on a sub-acute basis (5-day LC_{50} > 5620 ppm). It is practically non-toxic to small mammals (LD_{50} > 5000 mg/kg) and practically non-toxic to honey bees (LD_{50} > 105 g/bee).

Aquatic - Freshwater

Flumioxazin is slightly toxic to the bluegill sunfish (96-hour LC_{50} > 21.0 ppm) and moderately toxic to the rainbow trout (96-hour LC_{50} = 2.3 ppm). It is also moderately toxic to *Daphnia pulex* (48-hour EC_{50} = 5.5 ppm).

Aquatic - Estuarine/Marine

Flumioxazin is moderately toxic to the sheepshead minnow (96-hour LC_{50} > 4.7 ppm). It is moderately toxic to the eastern oyster (96-hour LC_{50}/EC_{50} = 2.4 ppm) and highly toxic to the mysid shrimp (96-hour LC_{50}/EC_{50} = 0.23 ppm).

Plants

Flumioxazin is highly toxic **to** terrestrial plants. Seedling emergence studies identified the most sensitive species to flumioxazin being lettuce (EC_{25} = 0.0008 pounds active ingredient/acre). Vegetative vigor studies with flumioxazin identified the cucumber as the most sensitive species (EC_{25} = 0.00008 pounds active ingredient/acre).

Mechanism of Pesticidal Action

Flumioxazin is a light-dependent peroxidizing herbicide (LDPH) which acts by blocking heme and chlorophyll biosynthesis resulting in an endogenous accumulation of photo-toxic porphyrins. This class of herbicides are known to have a photo-toxic mode of action in plants and possibly in fish. Standard toxicity testing may not include light with the same wavelength or intensity as natural

sunlight. LDPHs may be more toxic when exposed to natural sunlight, such as exposure conditions in the field.

4. SUMMARY OF REGULATORY POSITION AND RATIONALE

Available data provide adequate information to support the conditional registration of Valor WDG Herbicide for use on soybeans and peanuts.

Use, Formulation, Manufacturing Process or Geographic Restrictions

Environmental Hazards

This product is toxic to aquatic invertebrates. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Drift or runoff may be hazardous to aquatic organisms in neighboring areas. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from treated areas. Do not contaminate water when disposing of equipment washwaters.

Drift Reduction

AVOIDING SPRAY DRIFT AT THE APPLICATION SITE IS THE RESPONSIBILITY OF THE APPLICATOR. The interaction of many equipment-and-weather-related factors determine the potential for spray drift. The applicator is responsible for considering all these factors when making decisions. Where states have more stringent regulations, they should be observed.

Use Directions - General Precautions

Do not apply by air.

Do not apply this product through any type of irrigation system.

Do not apply this product when weather conditions favor spray drift from treated areas.

Do not graze treated fields or feed forage or hay to livestock.

Do not incorporate into the soil after application.

Do not rotate to cotton, field corn, rice, sorghum, sunflower, tobacco, or wheat for 30 days after application of 2 ounces or product per acre, or for 2 months after application of 3 ounces of product per acre. Do not rotate to barley, dry bean, rye, or sweet corn for 4 months after application of either rate. Do not rotate to alfalfa, canola, clover, oats, sugarbeet, or any other crops not listed for 12 months after application of either rate.

Use Directions - Wheat, Barley, Oats

Do not apply more than 3 oz. of product per acre during a single growing season.

Do not use flumioxazin in soybeans in the same field that flufenacet, alachlor, metolachlor, or dimethenamid will be used or soybean injury may occur.

5. SUMMARY OF DATA GAPS

Residue Chemistry Data:
• Confirmatory residue analytical method

Environmental Fate Data:
• Aqueous photolysis
• Anaerobic soil/aqueous metabolism
• Field dissipation data

6. CONTACT PERSON AT EPA

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