Aminopyralid

HERBICIDE FACT SHEET

U.S. DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION

This fact sheet is one of a series issued by the Bonneville Power Administration for their workers and the general public. It provides information on forest and land management uses, environmental and human health effects, and safety precautions. A list of definitions is included in Section VIII of this fact sheet.

I. BASIC INFORMATION

COMMON NAME: aminopyralid

CHEMICAL NAME: 4-amino-3,6-dichloro-2-pyridinecarboxylic acid,

Cas No. 150114-71-9

CHEMICAL TYPE: pyridine carboxylic acid

PESTICIDE CLASSIFICATION: herbicide

REGISTERED USE STATUS: General Use Pesticide.

FORMULATIONS: Commercial herbicide products generally contain one or more ingredients. An inert ingredient is anything added to the product other than an active ingredient. Because of concern for human health and the environment, EPA announced its policy on toxic inert ingredients in the Federal Register on April 22, 1987 (52FR13305). This policy focuses on the regulation of inert ingredients. EPA's strategy for implementing this policy included the development of four lists of inerts, based on toxicological concerns. Inerts of toxicological concern were placed on List 1. Potentially toxic inerts/high priority for testing were placed on List 2. Inerts of unknown toxicity were placed on List 3, and inerts of minimal and no concern were placed on List 4A and 4B, respectively.

The contents of the aminopyralid formulation for Milestone® / Milestone® VM are listed below:

Milestone® and/or Milestone® VM Herbicide			No listed inerts.
Active Ingredient	aminopyralid	40.6 %	
Inert Ingredients		59.4 %	

RESIDUE ANALYTICAL METHODS: No information available.

II. HERBICIDE USES

REGISTERED FORESTRY, RANGELAND AND RIGHT-OF-WAY USES: Aminopyralid is registered for use in non-crop sites including industrial sites, rights-of-way, non-irrigation ditches, rangeland, natural areas, wildlife openings, wildlife habitats, recreation areas, campgrounds, trailheads, and grazed areas in and around these sites. For terrestrial use only.

OPERATIONAL DETAILS:

TARGET PLANTS: Systemic post-emergence broad-spectrum herbicide for control of broadleaf weeds with residual action

MODE OF ACTION:

METHOD OF APPLICATION AND RATES: Ground broadcast spray, spot and localized spray applications. Rates adjustable not to exceed 7 fluid ounces per acre per growing season.

SPECIAL PRECAUTIONS:

TIMING OF APPLICATION: Timing is dependent on the target plant and desired results. Total vegetation management is best obtained with early spring applications coupled with later summer treatment for residual control.

DRIFT CONTROL: Care should be exercised not to overspray or apply the herbicide to adjacent non-target areas. Drift control is achieved by observing weather conditions and following label and sprayer instructions. Spray droplet size should be 150 microns or larger. Tank or hose pressure should not exceed 25 psi.

Restrictions/Warnings/Limitations:

T&E toxicity warning for ALL plants.

Do not use the product to treat irrigation ditches or other channels used for either agricultural or domestic purposes

Do not apply to residential or commercial lawns

Do not apply this product where loss of desirable broadleaf plants (including legumes) cannot be tolerated

Do not apply this herbicide via any type of irrigation system.

III. ENVIRONMENTAL EFFECTS/FATE

SOLUBILITY: 205 g/l in water (pH 7 at 25° C).

HYDROLYSIS: Stable.

PHOTOLYSIS IN WATER: Extremely susceptible.

PHOTOLYSIS ON SOIL: 72 days.

AEROBIC SOIL METABOLISM: AVERAGE: 103.5 days.

ANAEROBIC SOIL METABOLISM: 20 to 32 days.

K_{OC}: 1 TO 24 DEPENDING ON SOIL.

MOBILITY-UNAGED LEACHING: Relatively immobile.

MOBILITY-AGED LEACHING: Non-Persistent.

PERSISTENCE AND AGENTS OF DEGRADATION/DISSIPATION: The primary route of dissipation is photolysis. Carbon dioxide and oxamic and malonamic acid has been identified as major degradates.

METABOLITES/DEGRADATION PRODUCTS AND POTENTIAL ENVIRONMENTAL EFFECTS: None

POTENTIAL FOR LEACHING INTO SURFACE AND GROUND WATER: Little potential due to non-persistent and relatively immobile characteristics.

VOLATILIZATION: 7.14×10^{-11} mm Hg at 20° C.

POTENTIAL FOR BYPRODUCTS FROM BURNING OF TREATED VEGETATION: Information not available.

IV. ECOLOGICAL TOXICITY EFFECTS ON NON-TARGET SPECIES

TERRESTRIAL:

AVIAN ACUTE ORAL TOXICITY:	LD_{50} (bobwhite quail) >2250 mg/kg
AVIAN SUBACUTE DIETARY TOXICITY:	LC_{50} (bobwhite quail) >5556 mg/kg LC_{50} (mallard duck) >5496 mg/kg
AVIAN REPRODUCTION:	LOEC (bobwhite quail) 640 mg/kg
SMALL MAMMAL ACUTE ORAL TOXICITY:	LD_{50} (rat) >5000 mg/kg

OVERALL TOXICITY: Practically Non-Toxic

PLANTS: Contact will injure or kill target and non-target plants.

FRESHWATER AQUATIC SPECIES:

ACUTE TOXICITY: LC_{50} (rainbow trout 96-hour) >100 mg/l

ACUTE TOXICITY: LC_{50} (bluegill sunfish 96-hour) >100 mg/l

ACUTE TOXICITY: LC_{50} (northern leopard frog 96-hour) >95.2 mg/l

ACUTE TOXICITY: EC_{50} (Daphnia 48-hour) >98.6 mg/l

OVERALL FRESHWATER AQUATIC TOXICITY: Practically Non-Toxic

ESTUARINE/MARINE AQUATIC SPECIES:

ACUTE TOXICITY: LC_{50} (sheepshead minnow 96-hour) >120 mg/l

ACUTE TOXICITY: LC_{50} (eastern oyster 96-hour) >89 mg/l

ACUTE TOXICITY: LC_{50} (mysid shrimp 96-hour) >100 mg/l

OVERALL ESTUARINE/MARINE AQUATIC FRESHWATER TOXICITY: Slightly Toxic

BIOACCUMULATION POTENTIAL: Not expected to bioaccumulate in fish tissue**.**

THREATENED AND ENDANGERED SPECIES: Federally listed terrestrial and aquatic plants may be adversely affected if the product is applied directly to the plants, or indirectly as the result of drift or leaching.

V. TOXICOLOGICAL DATA

ACUTE TOXICITY:

ACUTE ORAL TOXICITY: LD_{50} (rat) >5000 mg/kg

ACUTE DERMAL TOXICITY: LD_{50} (rat) >5000 mg/kg

ACUTE INHALATION: LC_{50} (rat) >5.79 mg/l

OVERALL TOXICITY: **Category III – Slightly Toxic**

CHRONIC TOXICITY:

CARCINOGENICITY: No evidence of carcinogenicity in test animals.

DEVELOPMENTAL/REPRODUCTIVE: Some effects at highest dose levels.

MUTAGENICITY: Negative.

HAZARD: The end-use product labels for the aminopyralid formulation Milestone® carries the *Caution* signal word due to moderate eye irritation.

VI. HUMAN HEALTH EFFECTS

ACUTE TOXICITY (POISONING):

REPORTED EFFECTS: None reported.

CHRONIC TOXICITY:

REPORTED EFFECTS: None reported.

POTENTIAL FOR ADVERSE HEALTH EFFECTS FROM CONTACTING OR CONSUMING TREATED VEGETATION, WATER OR ANIMALS: None.

POTENTIAL FOR ADVERSE HEALTH EFFECTS FROM INERT INGREDIENTS CONTAINED IN THE FORMULATED PRODUCTS: None.

HEALTH EFFECTS OF EXPOSURE TO FORMULATED PRODUCTS: None reported.

HEALTH EFFECTS ASSOCIATED WITH CONTAMINANTS: None reported.

HEALTH EFFECTS ASSOCIATED WITH OTHER FORMULATIONS: None reported.

VII. SAFETY PRECAUTIONS

SIGNAL WORD AND DEFINITION:

AMINOPYRALID *(Milestone®)* - **CAUTION** –CAUSES MODERATE EYE IRRITATION

PROTECTIVE PRECAUTIONS FOR WORKERS: Applicators and other handlers must wear long-sleeved shirt and long pants, shoes plus socks.

MEDICAL TREATMENT PROCEDURES (ANTIDOTES):

EYES: Flush eyes with water for 15 to 20 minutes. Call physician.

SKIN: Wash all exposed areas with soap and water, call physician if irritation is present.

INGESTION: Rinse mouth thoroughly with water. Do not induce vomiting. Call physician.

INHALATION: Remove to fresh air. Call a physician if breathing difficulty persists.

HANDLING, STORAGE AND DISPOSAL: Store at room temperature or cooler. Do not reuse container. Rinse container and dispose accordingly.

EMERGENCY SPILL PROCEDURES AND HAZARDS: Contain and sweep up material of small spills and dispose as waste. Do not contaminate water, food, or feed by storage or disposal.

VIII. DEFINITIONS

adsorption – the process of attaching to a surface

avian – of, or related to, birds

CAEPA – California Environmental Protection Agency

carcinogenicity – ability to cause cancer

CHEMTREC – Chemical Transportation Emergency Center

dermal – of, or related to, the skin

EC_{50} - median effective concentration during a bioassay

ecotoxicological – related to the effects of environmental toxicants on populations of organisms originating, being produced, growing or living naturally in a particular region or environment

FIFRA – Federal Insecticide, Fungicide and Rodenticide Act

formulation – the form in which the pesticide is supplied by the manufacturer for use

half-life – the time required for half the amount of a substance to be reduced by natural processes

herbicide – a substance used to destroy plants or to slow down their growth

Hg – chemical symbol for mercury

IARC – International Agency for Research on Cancer

K(oc) – the tendency of a chemical to be adsorbed by soil, expressed as: K(oc) = conc. adsorbed/conc. dissolved/% organic carbon in soil

LC_{50} – the concentration in air, water, or food that will kill approximately 50% of the subjects

LD_{50} – the dose that will kill approximately 50% of the subjects

leach – to dissolve out by the action of water

LOEC – lowest observed effect concentration

mg/kg – weight ratio expressed as milligrams per kilogram

mg/l – weight-to-liquid ratio expressed as milligrams per liter

microorganisms – living things too small to be seen without a microscope

mPa – milli-Pascal (unit of pressure)

mutagenicity – ability to cause genetic changes

NFPA – National Fire Protection Association

NIOSH - National Institute for Occupational Safety and Health

NOEL - no observable effect level

non-target – animals or plants other than the ones that the pesticide is intended to kill or control

OSHA - Occupational Safety and Health Administration

Pa – Pascal (unit of pressure)

persistence – tendency of a pesticide to remain to remain in the environment after it is applied

pesticides – substances including herbicides, insecticides, rodenticides, fumigants, repellents, growth regulators, etc., regulated under FIFRA

PPE – personal protective equipment

ppm – weight ratio expressed as parts per million

residual activity – the remaining amount of activity as a pesticide

T&E – Threatened and Endangered Species (from the Endangered Species Act)

µg – micrograms

volatility – the tendency to become a vapor at standard temperatures and pressures

IX. INFORMATION SOURCES

Dow AgroSciences, Milestone® Specialty Herbicide, Specimen Product Label, Label Code: D02-879-001, August 29, 2005

Dow AgroSciences, Milestone® Specialty Herbicide, Material Safety Data Sheet, MSDS: 007887, May 18, 2004

Dow AgroSciences, Milestone® VM Specialty Herbicide, Specimen Product Label, Label Code: D02-880-001, November 4, 2005

Dow AgroSciences, Milestone® VM Specialty Herbicide, Material Safety Data Sheet, MSDS: 007887, January 3, 2006

USEPA, Pesticide Fact Sheet, Aminopyralid, Conditional Registration of a New Chemical, August 10, 2005

X. TOXICITY CATEGORY TABLES

TABLE I: HUMAN HAZARDS

Category	Signal Word	Route of Administration			Hazard	
		Acute Oral LD_{50} (mg/kg)	Acute Dermal LD_{50} (mg/kg)	Acute Inhalation LC_{50} (mg/l)	Eye irritation	Skin irritation
I (Highly Toxic)	**DANGER (poison)**	0–50	0-200	0-0.2	corrosive: corneal opacity not reversible within 7 days	corrosive
II (Moderately Toxic)	**WARNING**	>50–500	>200-2000	>0.2-2	corneal opacity reversible within 7 days; irritation persisting for 7 days	severe irritation at 72 hours
III (Slightly Toxic)	**CAUTION**	>500-5000	>2000-20.000	>2-20	no corneal opacity; irritation reversible within 7 days	moderate irritation at 72 hours
IV (Practically Non-toxic)	**NONE**	>5000	>20,000	>20	no irritation	moderate irritation at 72 hours

After *Pesticide User's Guide*, Ohio State University, Extension Bull. No. 745, 1998.

TABLE II: ECOTOXICOLOGICAL RISKS TO WILDLIFE (TERRESTRIAL AND AQUATIC)

Risk Category	Mammals Acute Oral LD_{50} mg/kg)	Avian Acute Oral LD_{50} (mg/kg)	Avian Acute Dietary LC_{50} (mg/kg)	Fish or Aquatic Invertebrates Acute Concentration LC_{50} (mg/l)
Very Highly Toxic	<10	<10	<50	<0.1
Highly Toxic	10-50	10-50	50-500	0.1 – 1
Moderately Toxic	51-500	51-500	501-1,000	>1 – 10
Slightly Toxic	501-2,000	501-2,000	1,001-5,000	>10 – 100
Practically Non-toxic	>2,000	>2,000	>5,000	>100

Table II created from information contained in *Pesticides and Wildlife*, Whitford, Fred, et al., Purdue University Cooperative Extension Service PPP-30, 1998.

Disclaimers and Other Legal Information:

Mention of a trademark, vendor, technique, or proprietary product does not imply or constitute an endorsement of the product by the United States Department of Energy - Bonneville Power Administration (USDOE-BPA), its employees, and its contractors, and does not imply or endorse any product to the exclusion of others. In all cases, the user is required by law to follow all pesticide label instructions and restrictions.

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