Environmental Assessment

1. Date March 17, 2026

2. Name of Applicant Evonik Active Oxygens, LLC

3. Address

Agent for Notifier:
Joseph M. Dages, Partner
Steptoe LLP
1330 Connecticut Avenue, N.W.
Washington, D.C. 20036

4. Description of Proposed Action

a. Requested Action

The action identified in this food contact notification (FCN) is to provide for the use of the food contact substance (FCS) identified as an aqueous mixture of peroxyacetic acid (PAA) (CAS Reg. No. 79-21-0), hydrogen peroxide (HP) (CAS Reg. No. 7722-84-1), acetic acid (AA) (CAS Reg. No. 64-19-7), 1-hydroxyethylidene-1,1-diphosphonic acid (HEDP) (CAS Reg. No. 2809-21-4), dipicolinic acid (DPA) (CAS Reg. No. 499-83-2), and optionally sulfuric acid (SA) (CAS Reg. No. 7664-93-9). The FCS is intended for use as an antimicrobial agent applied during the tempering and before milling of grains of wheat, corn, and rice, except for use in contact with infant formula ingredients. The FCS solution is sold as a concentrate that is diluted by the user as described on the label instructions.

When used as intended, the components of the FCS mixture on grains will not exceed: 350 ppm PAA, 1700 ppm HP, 12.5 ppm HEDP, 0.55 ppm DPA, and 25 ppm SA.

b. Need for Action

The FCS is intended for use as an antimicrobial agent to inhibit the growth of undesirable or pathogenic microorganisms on wheat, corn, and rice grains, except for use in contact with ingredients used for making infant formula.

The use of HEDP and DPA improve stability of concentrated peroxyacetic acid formulations during storage until they are diluted with water.

c. Locations of Use/Disposal

The FCS is intended for use as an antimicrobial agent to inhibit the growth of undesirable or pathogenic microorganisms on grains in grain processing facilities nationwide, where the processing of food will occur after treatment.

After use, the FCS will be disposed of with processing plant wastewater according to National Pollutant Discharge Elimination System (NPDES) regulations. For processing plants that hold a NPDES permit (i.e., direct dischargers), the FCS-containing wastewater will be treated on-site before direct discharge to surface waters. For processing plants without such

NPDES permits (i.e., indirect dischargers), the FCS-containing wastewater would travel through the sanitary sewer system into Publicly Owned Treatment Works (POTWs) for standard wastewater treatment processes before movement into aquatic environments. As a conservative approach, it can be assumed that wastewater will be treated onsite before discharge to surface water pursuant to a NPDES permit.

It is expected that process water not containing the FCS will be used in plants for activities such as cleaning and sanitation, resulting in significant dilution of HEDP and DPA into the total water effluent. We have also estimated maximum potential concentrations in soil from application of sludge from wastewater treatment facilities to soil.

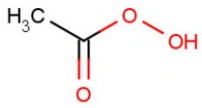
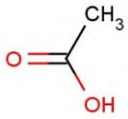
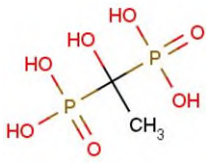
5. Identification of Substances that are Subject of the Proposed Action

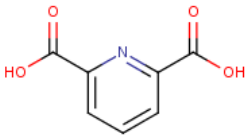
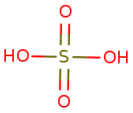
The raw materials used in this product are peroxyacetic acid, hydrogen peroxide, acetic acid, HEDP and/or DPA and optionally sulfuric acid and water. Peroxyacetic acid formation is the result of an equilibrium reaction between hydrogen peroxide and acetic acid. The FCS is supplied in concentrated form and is diluted at the processing plant for use to achieve the desired level of peroxyacid that is needed to address the microbial load.

The chemical equation for production of the FCS is:

$$CH_3CO_2H + H_2O_2 \rightarrow CH_3CO_3H + H_2O$$

Table 1: Chemical Identity of Substances of the Proposed Action

Component	CAS No.	Molecular Weight	Structural Formula	Molecular Formula
Peroxyacetic acid	79-21-0	76.05		$C_2H_4O_3$
Hydrogen peroxide	7722-84-1	34.01	HO-OH	H_2O_2
Acetic acid	64-19-7	60.05		$C_2H_4O_2$
1-Hydroxyethylidene-1,1-diphosphonic acid	2809-21-14	206.03		$C_2H_8O_7P_2$

Component	CAS No.	Molecular Weight	Structural Formula	Molecular Formula
Dipicolinic acid (DPA)	499-83-2	167.12		$C_7H6_6NO_4$
Sulfuric acid (optional)	7664-93-9	98.08		H_2SO4
Water	7732-18-5	18.01	H-O-H	H_2O

6. Introduction of Substances into the Environment

a. Introduction of Substances into the Environment as a Result of Manufacture

Under 21 C.F.R. § 25.40(a), an environmental assessment should focus on relevant environmental issues relating to the use and disposal from use, rather than the production, of FDA-regulated articles. The FCS is manufactured in plants which meet all applicable federal, state and local environmental regulations. The Notifier asserts that there are no extraordinary circumstances pertaining to the manufacture of the FCS such as: 1) unique emission circumstances that are not adequately addressed by general or specific emission requirements (including occupational) promulgated by Federal, State or local environmental agencies and that may harm the environment; 2) the action threatening a violation of Federal, State or local environmental laws or requirements; or 3) production associated with the proposed action that may adversely affect a species or the critical habitat of a species determined under the Endangered Species Act or the Convention on International Trade in Endangered Species of Wild Fauna and Flora to be endangered or threatened, or wild fauna or flora that are entitled to special protection under some other Federal law.

b. Introduction of Substances into the Environment as a Result of Use/Disposal

The antimicrobial agent is intended for use in process water for tempering grains throughout the United States. The FCS will be supplied concentrated to be diluted at grain processing facilities. Introduction of dilute solutions of the FCS into the environment will take place primarily via release from wastewater treatment systems. Introduction of the components of the FCS into the environment will result from use of the FCS as an antimicrobial agent in processing water and spray applications onto food. Following use, the disposal of such water and spray drainage will be into on-site treatment plants and/or POTWs. The total amount of product used at a typical facility will vary significantly, depending on the equipment used and the amount of food processed. To calculate highest exposure potential, the diluted FCS with the highest potential concentration FCS is used for further calculations. The maximum at-use

concentration of each component will be as follows: 350 ppm PAA, 1,700 ppm HP, 12.5 ppm HEDP, 0.55 ppm DPA, and 25 ppm SA.

Treatment of the process water at an on-site wastewater treatment plant before discharging to the POTW and surface waters is expected to result in complete degradation of PAA, hydrogen peroxide and acetic acid. Specifically, the PAA will break down into oxygen and water, while HP will break down into oxygen and water.[1] All three compounds are rapidly degraded on contact with organic matter, transition metals, and upon exposure to sunlight. The half-life of PAA in buffered solutions was 63 hours at pH 7 for a 748 ppm solution, and 48 hours at pH 7 for a 95 ppm solution.[2] The half-life of HP in natural river water ranged from 2.5 days when initial concentrations were 10,000 ppm, and increased to 15.2 days and 20.1 days when the concentration decreased to 250 ppm and 100 ppm, respectively.[3] In biodegradation studies of acetic acid using activated sludge, 99% degraded in 7 days under anaerobic conditions.[4] Acetic acid is not expected to concentrate in the wastewater discharged to the treatment facility/POTW. Therefore, AA is not expected to be introduced into the environment to any significant extent as a result of the proposed use of the FCS.

Sulfuric acid is listed as an optional ingredient in the FCS formulation. Sulfuric acid may be added to the reactants to increase the rate at which the solution reaches equilibrium.

Sulfuric acid is not a toxicological or environmental concern at the proposed use levels as it dissociates readily in water to sulfate and hydrated protons. While the environmental effects of aerosols of sulfuric acid and sulfates on the atmosphere and rain are well known, small quantities of water or terrestrial discharges are not expected to have significant environmental effects.[5]

Sodium sulfate is widely distributed in nature. It occurs as mineral salts (e.g., thenardite, mirabilite); it is present in almost all fresh and salt waters, and sulfate as such is normally present in almost all natural foodstuffs.

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[1] U.S. Environmental Protection Agency, *Reregistration Eligibility Decision: Peroxy Compounds* (December 1993), p. 18, available at https://archive.epa.gov/pesticides/reregistration/web/pdf/peroxy_compounds.pdf.

[2] European Centre for Toxicology and Toxicology of Chemicals (ECETOC), Joint Assessment of Commodity Chemicals (JACC) No. 40 Peracetic Acid and its Equilibrium Solutions, January 2001, Table 11, p. 29, available at http://www.ecetoc.org/jacc-reports.

[3] ECETOC, *JACC No. 22, Hydrogen Peroxide*, January, 1993, Table 6, p. 23, "Degradation in the River Saône of Hydrogen Peroxide," available at https://www.ecetoc.org/wp-content/uploads/2021/10/JACC-022.pdf.

[4] American Chemistry Council, Acetic Acid and Salts Panel, *U.S. High Production (HPV) Chemical Challenge Program: Assessment Plan for Acetic Acid and Salts Category*, June 28, 2001, Appendix 1, p. 1, https://iaspub.epa.gov/oppthpv/document_api.download?FILE=c13102tp.pdf.

[5] *See* Human and Environmental Risk Assessment (HERA) on ingredients of Household Cleaning Products, Sodium Sulfate, January 2006; see also The Organization for Economic Cooperation and Development (OECD) SIDS Voluntary Testing Programme for International High Production Volume Chemicals (OECD SIDS), Sulfuric Acid, 2001; available at https://hpvchemicals.oecd.org/UI/handler.axd?id=248f397d-64b3-4e14-8be9-473974e8dfdb.

Due to the low aquatic toxicity and the natural recycling that occurs in the sulfur cycle, wide dispersive use of small amounts of sodium sulfate presents no significant hazard to the environment.[6]

Therefore, these substances are not expected to be introduced into the environment to any significant extent as a result of the proposed use of the FCS. As a result, the remainder of this section, section 7, and section 8 will consider only the environmental introduction of HEDP and DPA.

Because it is difficult to establish water usage levels, we assume, in the very worst-case, that all of the water used in a plant is treated with the FCS, and we will use the maximum levels of HEDP and DPA to calculate the environmental introduction concentration (EIC) of HEDP and DPA, which would be 12.5 ppm and 0.55 ppm, respectively.

7. Fate of Emitted Substances in the Environment

The Human and Environmental Risk Assessment Project (HERA) report on phosphonates indicates that the treatment steps at an onsite wastewater treatment facility or POTW will remove at least a portion of any HEDP in the process water.[7] The HERA report cites 80% adsorption of HEDP to sewage treatment sludge.

Information in the literature indicates that DPA, a polysubstituted pyridine derivative, readily biodegrades in both freshwater and marine water aerobic and anaerobic conditions,[8] and in both anaerobic and aerobic soil conditions.[9] In presenting a review on the microbial metabolism of pyridines, including DPA, Kaiser, *et al*. describe aerobic metabolism of DPA to carbon dioxide, ammonium, and water, and anaerobic metabolism to dihydroxypyridine which is then rapidly photodegraded to organic acids (i.e., propionic acid, acetic acid), carbon dioxide, and ammonium.[10] Further information indicates that DPA is soluble in water, with the estimated

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[6] HERA – Cover Note of Sodium sulfate, Human and Environmental Risk Assessment on ingredients of Household Cleaning Products Substance: Sodium sulfate (CAS# 7757-82-6), Page 5, Item 4. Available at https://www.heraproject.com/files/39-F-06_Sodium_Sulfate_Human_and_Environmental_Risk_Assessment_V2.pdf.

[7] HERA, Human & Environmental Risk Assessment on Ingredients of European Household Cleaning Products, *Phosphonates (CAS 6419-19-8; 2809-21-4; 15827-60-8),* Draft 06/09/2004, Table 12, p. 22 available at http://www.heraproject.com/files/30-f-04-%20hera%20phosphonates%20full%20web%20wd.pdf.

[8] (1) Amador, J.A. and Tatlor, B.P., *Coupled metabolic and photolytic pathway for degradation of pyridinecarboxylic acids, especially dipicolinic acid*, Applied and Environmental Microbiology, 56(5): 1352-1356 (1990); (2) Seyfried B. and Schnink, B. *Fermentive degradation of dipicolinic acid (Pyridine-2,6- dicarboxylic acid) by a defined coculture of strictly anaerobic bacteria*, Biodegradation, 1(1), 1-7 (1990); (3) Kaiser, J.P., Feng, Y., and Bollag, J.M., *Microbial metabolism of pyridine, quinolone, acridine, and their derivatives under aerobic and anaerobic conditions*, Microbiological Reviews, 60(3): 483-498 (1996).

[9] (1) Naik, M.N. *et al*., *Microbial Degradation and Phytotoxicity of Picloram and Other Substituted Pyridines*, Soil Biology and Biochemistry, 4: 313-323 (1972), see p. 320; (2) Sims, G.K. and Sommers, L.E., *Biodegradation of Pyridine Derivatives in Soil Suspensions*, 5:503-509 (1986).

[10] Kaiser, p. 488.

water solubility of 5,000 mg/L and an octanol-water partition coefficient estimated to be 0.57.[11] Based upon this information, it is reasonable to conclude that DPA will substantially remain with water and not be absorbed to sludge, and that DPA will be readily biodegraded during treatment at POTWs and on-site treatment facilities.

We have estimated the potential environmental introduction concentrations (EICs) of HEDP and DPA in water and sewage sludge based upon the information above. We have used the maximum use levels for HEDP and DPA, based on the amount in solution when diluted with water, of 12.5 ppm and 0.55 ppm, respectively. To calculate the EICs for HEDP in water and sewer sludge we have applied the 20:80 partition factor from the HERA report (EIC_{sludge} = 12.5 x 80% = 10 ppm; EIC_{water} = 12.5 x 20% = 2.5 ppm). (*See* Table 3 below).

When the water from the facility or POTW is discharged to surface waters, HEDP and DPA will be diluted a further 10-fold, resulting in an estimated environmental concentration (EEC) of 0.25 ppm and 0.055 ppm, respectively.[12]

Table 2: Worst-case EICs and EECs for HEDP and DPA

Component	EIC Total	EEC_{sludge}	EEC_{water}
HEDP	12.5 ppm	10 ppm[13]	0.25 ppm[14]
DPA	0.55 ppm		0.055 ppm[15]

Finally, we note that the HEDP EIC for sludge is a maximum for terrestrial impacts, as any sludge used as a soil amendment will likely be significantly diluted by soil or sludge from other sources.

8. Environmental Effects of Released Substances

a. Terrestrial Toxicity

The HERA report discusses biodegradation of HEDP and estimates a half-life in soil of 373 days. Therefore, HEDP is expected to degrade, albeit slowly, in soil. HEDP shows no toxicity to terrestrial organisms at levels up to 1000 mg/kg soil dry weight (No Observed Effect Concentration; NOEC).[16] Our maximum estimated concentration in sludge (10 ppm) is well

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[11] https://chem.nlm.nih.gov/chemidplus/rn/499-83-2.

[12] Rapaport, R.A., *Prediction of consumer product chemical concentrations as a function of publicly owned treatment works treatment type and riverine dilution*, Environmental Toxicology and Chemistry 7(2), 107-115 (1988). https://setac.onlinelibrary.wiley.com/doi/abs/10.1002/etc.5620070204.

[13] Example Calculation 12.5 ppm x 80% = 10 ppm

[14] Example Calculation 12.5 ppm x 20%/10 = 0.25 ppm

[15] Example Calculation 0.55 ppm/10 = 0.055 ppm

[16] Jaworska, J., *et al.*, *Environmental risk assessment of phosphonates, used in domestic industry and cleaning agents in the Netherlands*, Chemosphere 2002, 47(6), 655-665, May 2002. https://pubmed.ncbi.nlm.nih.gov/12047077/.

below the NOEC, and the maximum concentration in soil when used as a soil amendment should have an even larger margin of safety with respect to the NOEC. Therefore, the FCS is not expected to have any terrestrial environmental toxicity concerns at levels at which it is expected to be present in sludge or soil. Moreover, the much smaller level of HEDP present in the surface water is not expected to have any adverse environmental impact with respect to sedimentation based on the terrestrial toxicity endpoints available for plants, earthworms, and birds.[17]

As noted above, DPA is soluble in water and very little, if any, DPA is expected to partition to sludge. Accordingly, terrestrial releases of DPA from the intended uses of the FCS are anticipated to be negligible and no toxicity concerns are expected.

b. Aquatic Toxicity

Aquatic toxicity of HEDP has been summarized, and is shown in the following table:

Table 3: Summary of Environmental Toxicity Data for HEDP[18]

Exposure	Species	Endpoint	mg/L
Short Term	*Lepomis macrochirus*	96-hr LC50	868
	Oncorhynchus mykiss	96-hr LC50	360
	Cyprinodon variegatus	96-hr LC50	2180
	Ictalurus punctatus	96-hr LC50	695
	Leuciscus idus melonatus	48-hr LC50	207 – 350
	Daphnia magna	24 – 48 hr EC50	165 – 500
	Palaemonetes pugio	96-hr EC50	1770
	Crassostrea virginica	96-hr EC50	89
	Selenastrum capricornutum	96-hr EC50	3
	Selenastrum capricornutum	96-hr NOEC	1.3
	Algae	96-hr NOEC	0.74
	Chlorella vulgaris	48-hr NOEC	≥100
	Pseudomonas putida	30-minute NOEC	1000
Long Term	*Oncorhynchus mykiss*	14-day NOEC	60 – 180
	Daphnia magna	28-day NOEC	10 – <12.5
	Algae	14-day NOEC	13

[17] *Ibid.*

[18] Short term values for *Lepomis macrochirus*, *Oncorhynchus mykiss*, *Cyprinodon variegatus*, *Ictalurus punctatus*, *Leuciscus idus melonatus*, *Daphnia magna*, *Palaemonetes pugio*, *Crassostrea virginica*, *Chlorella vulgaris*, *Pseudomonas putida*, and long term values for *Oncorhynchus mykiss*, *Daphnia Magna* found in Jaworska, *et al*., p. 662 (2002). Short term values for *Selenastrum capricornutum*, and short and long term values for algae found in HERA (2004) (Tables 13 and 14, p. 29-31).

According to Jaworska *et al*.,[19] the primary adverse effects of HEDP result from chelation of nutrients rather than direct toxicity of HEDP. Chelation is not toxicologically relevant in the current evaluation because eutrophication, not nutrient depletion, has been demonstrated to be the controlling toxicological mode when evaluating wastewater discharges from food processing facilities. The lowest short-term EC_{50} values published for *Selenastrum capricornutum* (3 ppm), *Daphnia magna* (165 ppm), and *Crassostrea virginica* (89 ppm) are acute toxicity endpoints considered to result from this chelation effect. These values are not relevant when excess nutrients are present as expected in food processing wastewaters. The lowest relevant endpoint for food processing uses was determined to be the chronic NOEC of 10 ppm for *Daphnia magna*. Although uncertainties intrinsic to its derivation make the usefulness of the NOEC debatable,[20] based on the available environmental toxicology data, reliance upon the NOEC for *Daphnia magna* is appropriate.[21] The conservatively estimated EEC of 0.25 ppm is lower the 10 ppm chronic NOEC for *Daphnia magna*, and the FCS is not expected to have any aquatic toxicity. Thus, HEDP is not expected to pose a significant environmental impact at the proposed use level.

There is little publicly available ecotoxicology data for DPA. A review of EPA's ECOTOX database provides one study indicating a freshwater fish 96-hour LC_{50} of 322 mg/L for fathead minnow.[22] In the absence of literature data, we have evaluated DPA using the Ecological Structure Activity Relationships (ECOSAR) Class Program, which is a computerized predictive system maintained and developed by the U.S. EPA that estimates aquatic toxicity. The program estimates a chemical's acute (short-term) toxicity and chronic (long-term or delayed) toxicity to aquatic organisms, such as fish, aquatic invertebrates, and aquatic plants, by using computerized Structure Activity Relationships (SARs).[23] This program is a sub-routine of the Estimation Program Interface (EPI) Suite – a structure-function predictive modeling suite also developed and maintained by the U.S. EPA.[24] The ECOSAR results for DPA predict the

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[19] Jaworska, *et al*. (2002).

[20] Blok J. and Balk F., *Environmental regulation in the European Community*, in Fundamentals of Aquatic Toxicology: Effects, Environmental Fate, and Risk Assessment, (GM Rand, Ed.), Taylor & Francis, New York, 1995, chapter 27 ("NOEC determinations are likely more statistically variant (uncertain) than EC_{50} determinations"); also see Organisation for Economic Co-operation and Development (OECD), *Current Approaches in the Statistical Analysis of Ecotoxicity Data: A Guidance to Application*, OECD Environmental Health and Safety Publications, Series on Testing and Assessment, No. 54, Environment Directorate, Paris, 2006 (recommending that that NOECs be abandoned), available at http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2006)18&doclanguage=en.

[21] Jaworska, *et al*. (2002).

[22] *See* enclosed ECOTOX report. The ECOTOX database can be accessed here: https://cfpub.epa.gov/ecotox/search.cfm.

[23] Information on ECOSAR can be found at https://www.epa.gov/tsca-screening-tools/ecologicalstructure-activity-relationships-ecosar-predictive-model.

[24] EPISuite predicts various physical-chemical properties and environmental fate endpoints and also include models for environmental transport. Running the tool will give the user an indication of the transport and persistence of a chemical. Information on EPI Suite is available at https://www.epa.gov/tsca-screeningtools/epi-suitetm-estimation-program-interface.

following acute and chronic toxicity endpoints tabulated below.[25] The complete ECOSAR report for this analysis is attached to this EA.

ECOSAR Class	Organism	Endpoint	mg/L
Pyridine-alpha-acid	Fish	96 hr LC50	324
	Fish	Chronic value (ChV)	32.4
	Green Algae	96 hr EC50	14.0
	Green Algae	ChV	7.69

These values are all much higher than the "worst-case" scenario of an EECaq of 0.055 ppm. Thus, the use of DPA at such a minimal level is not expected to result in any adverse environmental effects.

9. Use of Resources and Energy

The notified use of the FCS mixture will not require additional energy resources for the treatment and disposal of wastes as the FCS is expected to compete with, and to some degree replace similar HEDP/DPA stabilized peroxy antimicrobial agents already on the market. The raw materials that are used in production of the mixture are commercially-manufactured materials that are produced for use in a variety of chemical reactions and production processes. Energy used specifically for the production of the mixture components is not significant.

10. Mitigation Measures

As discussed above, no significant adverse environmental impacts are expected to result from the use and disposal of the dilutions of antimicrobial product. Therefore, no mitigation measures are required.

11. Alternatives to the Proposed Action

No significant adverse environmental effects are identified herein that would necessitate alternative actions to that proposed in this Food Contact Notification. If the proposed action is not approved, the result would be the continued use of the currently marketed antimicrobial agents that the subject FCS would replace. Such action would have no significant environmental impact.

12. List of Preparers

Ms. Patricia Kinne, Environmental Specialist, Steptoe LLP, 1330 Connecticut Avenue, N.W., Washington, D.C. 20036, with over 10 years of experience with food contact compliance matters, including FCN submissions and chemical registration submissions.

[25] *See* EPI Suite – ECOSAR Program Results for CAS 499-83-2 included as an Attachment to this EA. Chronic toxicity was estimated through application of acute-to-chronic ratios per methods outlined in the ECOSAR Methodology Document provided in the ECOSAR Help Menu.

Joseph M. Dages, Partner, Steptoe LLP, 1330 Connecticut Avenue, N.W., Washington, D.C. 20036, with 19 years of experience working in the food regulatory arena, including over ten years as an attorney working on FCN submissions and environmental assessments.

13. Certification

The undersigned official certifies that the information provided herein is true, accurate, and complete to the best of his knowledge.

Date: March 17, 2026

Joseph M. Dages

14. References

Amador, J.A. and Tatlor, B.P., *Coupled metabolic and photolytic pathway for degradation of pyridinecarboxylic acids, especially dipicolinic acid*, Applied and Environmental Microbiology, 56(5): 1352-1356 (1990).

American Chemistry Council, Acetic Acid and Salts Panel, *U.S. High Production (HPV) Chemical Challenge Program: Assessment Plan for Acetic Acid and Salts Category*, June 28, 2001.

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Seyfried B. and Schnink, B. *Fermentive degradation of dipicolinic acid (Pyridine-2,6-dicarboxylic acid) by a defined coculture of strictly anaerobic bacteria*, Biodegradation, 1(1), 1-7 (1990).

Sims, G.K. and Sommers, L.E., *Biodegradation of Pyridine Derivatives in Soil Suspensions*, 5:503-509 (1986).

U.S. Environmental Protection Agency, *Reregistration Eligibility Decision: Peroxy Compounds* (December 1993).

15. Attachments

ECOSAR Organic Module Report for Dipicolinic Acid

ECOTOX Aquatic Report for Dipicolinic Acid

EA ATTACHMENT 1

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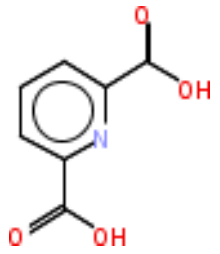
ECOSAR Organic Module Report for Dipicolinic Acid

Results of Organic Module Evaluation

CAS	Name	SMILES	Structure
499832	2,6-Pyridinedicarboxylic acid	O=C(O)c(nc(cc1)C(=O) O)c1	

Details	Value
Mol Wt	167.12
Selected LogKow	
Selected Water Solubility (mg/L)	
Selected Melting Point (°C)	
Estimated LogKow	0.57
Estimated Water Solubility (mg/L)	4829.06
Measured LogKow	
Measured Water Solubility (mg/L)	5000
Measured Melting Point (°C)	249

Class Results:	Organism	Duration	End Point	Concentration (mg/L)	Max Log Kow	Flags
Pyridine alpha-acid	Fish	96h	LC50	3.24E02	5	
	Green Algae	96h	EC50	1.40E01	6.4	
	Fish		ChV	3.24E01	8	*(a)*
	Green Algae		ChV	7.69E00	8	

(a) The toxicity value was estimated through application of acute-to-chronic ratios per methods outlined in the ECOSAR Methodology Document

EA ATTACHMENT 2

ECOTOX Aquatic Report for Dipicolinic Acid

ECOTOX Aquatic Report for CASRN 499-83-2 (2,6-Pyridinedicarboxylic acid)

Parameter	Value
CAS Number	499-83-2
Chemical Name	2,6-Pyridinedicarboxylic acid
Chemical Grade	Not reported
Chemical Analysis	Measured
Chemical Purity Mean %	99
Species Scientific Name	Pimephales promelas
Species Common Name	Fathead Minnow
Species Group	Fish; Standard Test Species
Organism Life Stage	Not reported
Organism Age Mean	33
Age Units	Day(s)
Exposure Type	Flow-through
Media Type	Fresh water
Test Location	Lab
Number of Doses	Not reported
Conc 1 Type (Standardized)	Active ingredient
Conc 1 Mean (Standardized)	322
Conc 1 Units (Standardized)	AI mg/L
Effect	Mortality
Effect Measurement	Mortality
Endpoint	LC50
Response Site	Not reported
Observed Duration Mean (Days)	4
Observed Duration Units (Days)	Day(s)
Author	Geiger,D.L., S.H. Poirier, L.T. Brooke, and D.J. Call
Reference Number	12858
Title	Acute Toxicities of Organic Chemicals to Fathead Minnows (Pimephales promelas) Volume III
Source	Center for Lake Superior Environmental Studies, University of Wisconsin, Superior, WI:328 p.
Publication Year	1986
Reference Type	EPA Fathead Minnow Acute Toxicity Database (MED-Duluth)