GreenScreen™ Assessment for *V6 (CAS 38051-10-4)*

Method Version: GreenScreen™ Version 1.2[1]

GreenScreen (GS) Assessment Type[2]: CERTIFIED

Introduction[3,4,5]

This GreenScreen assessment, for all hazard endpoints (except reactivity), is based solely on the information reported in the corresponding chemical hazard profile in "An Alternatives Assessment for Flame Retardants Used in Flexible Polyurethane Foam[3].

Additional information on hazard endpoints (other than reactivity) beyond what was reported in the draft June 2014 report was not sought. It was necessary to supplement the hazard classification for reactivity as it is not included in the DfE approach but is needed in order to apply the GreenScreen Benchmarks.

Differences in hazard classification levels reported in the DfE profiles and in this GreenScreen report may be due to differences between criteria as defined in the DfE "Alternatives Assessment Criteria for Hazard Evaluation"[4] and the GreenScreen for Safer Chemicals v1.2 methods[5]. Any differences in interpretation are explained and justified in this GreenScreen report.

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Licensed Profiler or Certified Practitioner (specify): N/A	Licensed Profiler or Certified Practitioner (specify): N/A

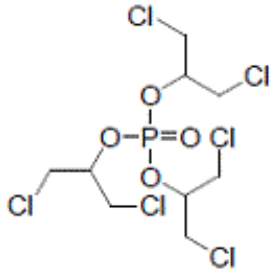
Confirm application of the *Disclosure and Assessment Rules and Best Practice*[6]: (List any deviations)
Disclosure thresholds applied by DfE are unclear in the DfE report.

Chemical Name (CAS #): V6 (*CAS# 38051-10-4)*

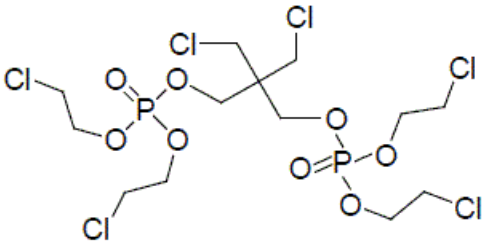
[1] Use GreenScreen™ Assessment Procedure (Guidance) V1.2
[2] Available at: http://www.greenscreenchemicals.org/about/greenscreen-terms-of-use
[3] Available at: http://www.epa.gov/dfe/pubs/projects/flameret/ffr-update-complete.pdf, accessed 11/2014.
[4] Available at: http://www.epa.gov/dfe/alternatives_assessment_criteria_for_hazard_eval.pdf, accessed 10/2013.
[5] Details available at: http://www.cleanproduction.org/Greenscreen.v1-2.php, accessed 10/2013.
[6] See GreenScreen Guidance V1.2 Section 8

Also Called:
V6; Amgard V6; BCMP-BCEP; 2,2-bis(chloromethyl)trimethylene bis(bis(2-chloroethyl) phosphate); tetrekis(2-chlorethyl)dichloroisopentyldiphosphate

Suitable analogs or moieties of chemicals used in this assessment (CAS #'s):
2-Propanol, 1,3-dichloro-, phosphate (CAS # 13674-87-8)



Chemical Structure(s):



Notes related to production specific attributes[7]:

For Inorganic Chemicals and relevant particulate organics (*if not relevant, list NA*)
Define Properties:
1. Particle size (e.g., silica of respirable size): NA
2. Structure (e.g., amorphous vs. crystalline): NA
3. Mobility (e.g., water solubility, volatility): NA
4. Bioavailability: Absorption of Phosphoric acid, P,P'-[2,2-bis(chloromethyl)-1,3-propanediyl] P,P,P',P'-tetrakis(2- chloroethyl) ester (V6) from the gastrointestinal tract is nearly 100% following oral exposure in rats.

Identify Applications/Functional Uses: (e.g., Cleaning product, TV casing)
1. Flame Retardant

[7] Note any composition or hazard attributes of the chemical product relevant to how it is manufactured. For example, certain synthetic pathways or processes result in typical contaminants, by-products or transformation products. Explain any differences between the manufactured chemical product and the GreenScreen assessment of the generic chemical by CAS #.

GreenScreen Benchmark™ Score and Hazard Summary Table:[8,9,10,11]

V6 (CAS 38051-10-4) was assigned a **GS Benchmark Score of 2** based on moderate Group I human toxicity endpoints, and very high persistence along with high ecotoxicity. In a worst case scenario V6 would be classified a benchmark 1 if any of the Human Group II data gap were filled with data indicating a high hazard score.

Green Screen Hazard Ratings: V6																	
Group I Human					Group II and II* Human								Ecotox		Fate		Physical	
C	M	R	D	E	AT	ST		N		SnS*	SnR*	IrS	IrE	AA	CA	P	B	Rx	F
						single	repeated*	single	repeated*										
M	L	L	M	M	L	NA	M	NA	L	L	DG	M	M	M	*H*	vH	*vL*	*L*	*L*

Note: Hazard levels (Very High (vH), High (H), Moderate (M), Low (L), Very Low (vL)) in *italics* reflect estimated values, authoritative B lists, screening lists, weak analogues, and lower confidence. Hazard levels in **BOLD** font are used with good quality data, authoritative A lists, or strong analogues. Group II Human Health endpoints differ from Group II* Human Health endpoints in that they have four hazard scores (i.e., vH, H, M and L) instead of three (i.e., H, M and L), and are based on single exposures instead of repeated exposures. NA reflects that there was not data for this endpoint in the DfE assessment; however, it is not considered a data gap if the DfE report assesses repeated dose data for the same endpoint.

Environmental Transformation Products and Ratings[12]: Identify feasible and relevant environmental transformation products (i.e., dissociation products, transformation products, valence states) and/or moieties of concern[13]

Functional Use	Life Cycle Stage	Transformation Pathway	Environmental Transformation Products	CAS #	Feasible and Relevant?	GS List Translator or Benchmark Scores
			None Available[14]			

[8] See Appendix A for a glossary of hazard endpoint acronyms
[9] See Appendix B for alternative GreenScreen Hazard Summary Table (Classification presented by exposure route)
[10] For inorganic chemicals only, see GreenScreen Guidance V1.2 Section 14.4. (Exceptions for Persistence)
[11] For Systemic Toxicity and Neurotoxicity, repeated exposure data are preferred. Lack of single exposure data is not a Data Gap when repeated exposure data are available. In that case, lack of single exposure data may be represented as NA instead of DG. See GreenScreen Guidance V1.2 Section 9.3.
[12] See GreenScreen Guidance V1.2 Section 13
[13] A moiety is a discrete chemical entity that is a constituent part or component of a substance. A moiety of concern is often the parent substance itself for organic compounds. For inorganic compounds, the moiety of concern is typically a dissociated component of the substance or a transformation product.
[14] Only metabolites listed in the DfE report.

Introduction

This is a discrete organic chemical with a MW below 1,000. EPI v4.11 was used to estimate physical/chemical and environmental fate values due to an absence of experimental data. Commercially available forms of this chemical have a purity of >85-90% (w/w). Impurities anticipated to be present in the commercial product are: 1,2 dichloroethane (CASRN 107-06-2) and 4.5-7.5% TCEP or tris(chloroethyl) phosphate (CASRN 115-96-8) (EU, 2008a; CELLTECH, 2009).

Hazard Classification Summary Section:

Group I Human Health Effects (Group I Human)

Carcinogenicity (C) Score (H, M or L): *M*

V6 was assigned a score of MODERATE for carcinogenicity based on a moderate score within the EPA's DfE Alternatives Assessment. The EPA's classification is based on OncoLogic program estimates and an increase in benign tumors of the adrenal cortex and liver in a 2-year study with an analog chemical 2-Propanol, 1,3- dichloro-, phosphate (CASRN 13674-87-8). The score was based on the modeling and analog is therefore reported in italics within the GreenScreen assessment.

The summary provided within the EPA's Alternatives Assessment was as follows:
MODERATE: Based on the weight of evidence. There were no carcinogenicity studies located for Phosphoric acid, P,P'-[2,2-bis(chloromethyl)-1,3-propanediyl] P,P,P',P'-tetrakis(2-chloroethyl) ester (V6), however; there was no evidence of mutagenicity from genotoxicity studies. The OncoLogic program estimated a Low-Moderate concern for carcinogenicity and there was an increase in benign tumors of the adrenal cortex and liver in a 2-year study with an analog chemical 2-Propanol, 1,3- dichloro-, phosphate (CASRN 13674-87-8). Due to concerns based on structure and analogs, a moderate hazard designation is warranted.

Mutagenicity/Genotoxicity (M) Score (H, M or L): L

V6 was assigned a score of LOW for mutagenicity based on a low score within the EPA's DfE Alternatives Assessment. The EPA's classification is based on negative results in both *in vitro* and *in vivo* studies. The low designation for mutagenicity in both GreenScreen and EPA's Alternatives Assessment is based on the same criteria. The score was based on study data within EPA's Alternatives Assessment and therefore is bolded within the GreenScreen assessment.

The summary provided within the EPA's Alternatives Assessment was as follows:
LOW: Based on no evidence of mutagenicity in either *in vitro* or *in vivo* genotoxicity studies.

Reproductive Toxicity (R) Score (H, M, or L): L

V6 was assigned a score of LOW for reproductive toxicity based on a data provided within the EPA's DfE Alternatives Assessment. The EPA's moderate classification is based on the analog 2-Propanol, 1,3-dichloro-, phosphate which produced atrophy and decreased secretory product of the seminal vesicle in an oral two-year combined chronic toxicity and carcinogenicity assay in rats. The DfE report however, does include data reproductive toxicity data specific to V6 which indicates a low reproductive hazard. Specifically, V6 did not produce reproductive toxicity in an

oral 2-generation reproductive study or in a 4-week gavage study in rats at doses up to 600 mg/kg-day (LOAELs were not established). Therefore the hazard score herein is based on the data specific for V6. For reproductive toxicity, EPA's DFE uses numerical data quantifying the hazard associated with the 3 different hazard levels, whereas GreenScreen does not base the hazard score on a numerical rating system but bases classifications on listing under GHS, the EU, and NTP. Therefore the conversion of DfE's reproductive toxicity conclusion to comparable GreenScreen hazard scores is done on a case by case basis. The score was based upon study data included within the EPA's Alternatives Assessment and therefore is bolded within the GreenScreen assessment.

The summary provided within the EPA's Alternatives Assessment was summarized as follows:
MODERATE: Based on weight of evidence from multiple studies. Phosphoric acid, P,P'-[2,2-bis(chloromethyl)-1,3-propanediyl] P,P,P',P'-tetrakis(2-chloroethyl) ester (V6) did not produce reproductive toxicity in an oral 2-generation reproductive study or in a 4-week gavage study in rats at doses up to 600 mg/kg-day (LOAELs were not established). Data using the analog 2-Propanol, 1,3- dichloro-, phosphate reported a LOAEL of 5 mg/kg-day (NOAEL not established) for atrophy and decreased secretory product of the seminal vesicle in an oral two-year combined chronic toxicity and carcinogenicity assay in rats. A 12-week fertility study in rabbits using the analog 2-Propanol, 1,3- dichloro-, phosphate reported a NOAEL of 200 mg/kg-day; there is uncertainty if reproductive effect could occur at a dose up to 250 mg/kg-day (the cutoff for the Moderate hazard designation criteria range).

Developmental Toxicity incl. Developmental Neurotoxicity (D) Score (H, M or L): M
V6 was assigned a score of MODERATE for developmental toxicity based on a data presented within the EPA's DfE Alternatives Assessment. The EPA's classification is based on increased a NOAEL of 29 mg/kg-day (LOAEL of 86 mg/kg-day) for increased number of runts and decreased pup weight in an oral 2-generation study in rats. For developmental toxicity, EPA's DfE uses numerical data quantifying the hazard associated with the 3 different hazard levels, whereas GreenScreen does not base the hazard score on a numerical rating system but bases classifications on listing under GHS, the EU, and NTP. Therefore the conversion of DfE's developmental toxicity conclusions to comparable GreenScreen hazard scores is done on a case by case basis. It has been concluded herein that the developmental toxicity studies included within the DfE report fulfill the level of confidence required to assign a GHS category 2 developmental hazard classification and is adequately characterized as a moderate hazard under the GreenScreen. The score was based upon study data included within the EPA's Alternatives Assessment and therefore is bolded within the GreenScreen assessment.

The summary provided within the EPA's Alternatives Assessment was as follows:
HIGH: Based on a NOAEL of 29 mg/kg-day (LOAEL of 86 mg/kg-day) for increased number of runts and decreased pup weight in an oral 2-generation study in rats. No developmental NOAEL/LOAEL could be established in a prenatal toxicity study in rats due to low survival of dams. There were no data located for the developmental neurotoxicity endpoint. Uncertain concern for the developmental neurotoxicity based on the potential for Cholinesterase (ChE) inhibition in dams that may result in alterations of fetal neurodevelopment.

Endocrine Activity (E) Score (H, M or L): M

V6 was assigned a score of MODERATE for endocrine activity based on endocrine glands effects in animal studies without clear evidence of related human health effects. The score was based upon study data included within the EPA's Alternatives Assessment and therefore is bolded within the GreenScreen assessment.

The summary provided within the EPA's Alternatives Assessment was as follows:
There were thyroid weight changes and associated histopathology in an oral 2-generation study in rats and there was an increase in benign tumors of the adrenal cortex and liver in a 2-year study with an analog chemical 2-Propanol, 1,3-dichloro-, phosphate (CASRN 13674-87-8).

Group II and II* Human Health Effects (Group II and II* Human)

Note: Group II and Group II endpoints are distinguished in the v 1.2 Benchmark system (the asterisk indicates repeated exposure). For Systemic Toxicity and Neurotoxicity, Group II and II* are considered sub-endpoints. When classifying hazard for Systemic Toxicity/Organ Effects and Neurotoxicity endpoints, repeated exposure results are required and preferred. Lacking repeated exposure results in a data gap. Lacking single exposure data does not result in a data gap when repeated exposure data are present (shade out the cell in the hazard table and make a note). If data are available for both single and repeated exposures, then the more conservative value is used.*

Acute Mammalian Toxicity (AT) Group II Score (vH, H, M or L): L

V6 was assigned a score of LOW for acute mammalian toxicity based on a low score within the EPA's DfE Alternatives Assessment. Acute mammalian toxicity classification in both the EPA's DfE and GreenScreen is based on the same criteria. The acute mammalian toxicity score was based on test data and therefore is bolded within the GreenScreen assessment.

The summary provided within the EPA's Alternatives Assessment was as follows:
LOW: Phosphoric acid, P,P'-[2,2-bis(chloromethyl)-1,3-propanediyl] P,P,P',P'-tetrakis(2-chloroethyl) ester (V6) is not acutely toxic via the oral or inhalation routes of exposure in rats or via the dermal route of exposure in rabbits.

Systemic Toxicity/Organ Effects incl. Immunotoxicity (ST)

(ST-single) Group II Score (single dose: vH, H, M or L):

DfE evaluates Systemic Toxicity based on repeated exposures. Lack of data for Systemic Toxicity based on a single exposure does not constitute a data gap when data for repeated exposures are available. This endpoint was not assessed by DfE in this evaluation and is assigned an 'NA'.

(ST-repeat) Group II* Score (repeated dose: H, M, L): M

V6 was assigned a score of MODERATE for repeated exposure systemic toxicity/organ effects based on a moderate score within the EPA's DfE report. The DfE score is based on liver and thyroid weight changes and associated histopathology in an oral 2-generation study in rats and liver effects following oral administration for 28 days. The moderate designation for repeated exposure systemic toxicity/organ effects in both GreenScreen and EPA's Alternatives Assessment is based on the same criteria. The data for immunotoxicity included in the DfE

report supports a moderate GreenScreen score. The score was based on study data and therefore is bolded within the GreenScreen assessment.

The summary provided within the EPA's Alternatives Assessment was as follows:
MODERATE: Based on a NOAEL of 29 mg/kg-day (LOAEL= 86 mg/kg-day) for liver and thyroid weight changes and associated histopathology in an oral 2-generation study in rats. Liver effects were also observed in rats at a dose of 150 mg/kg-day following oral administration for 28 days (NOAEL = 15 mg/kg-day). No neurological effects were reported in a 4-week repeated-dose oral study in rats at a dose of 600 mg/kg-day (highest dose tested). In a 2-year combined oral chronic toxicity and carcinogenicity study in rats using analog chemical, 2-Propanol, 1,3-dichloro-, phosphate (CASRN 13674-87-8), a LOAEL of 5 mg/kg-day (lowest dose tested) was established for anomalies of the liver, kidneys, testes, renal cortex, and adrenal cortex.

In addition, decreased absolute and relative spleen weights and decreased absolute thymus weights were observed in pups in an oral 2-generation reproductive toxicity study in rats.

Neurotoxicity (N)
(N-single) Group II Score (single dose: vH, H, M or L):
DfE evaluates Neurotoxicity based on repeated exposures. Lack of data for Neurotoxicity based on a single exposure does not constitute a data gap when data for repeated exposures are available. This endpoint was not assessed by DfE in this evaluation and is assigned an 'NA'.

(N-repeat) Group II* Score (repeated dose: H, M, L): L
V6 was assigned a score of LOW for neurotoxicity based on a low score within the EPA's DfE Alternatives Assessment. The low designation in both GreenScreen and EPA's Alternatives Assessment is based on the same criteria. The score was based on study data within EPA's Alternatives Assessment and therefore is bolded within the GreenScreen assessment.

The summary provided within the EPA's Alternatives Assessment was as follows:
LOW: Phosphoric acid, P,P'-[2,2-bis(chloromethyl)-1,3-propanediyl] P,P,P',P'-tetrakis(2-chloroethyl) ester (V6) was not neurotoxic to rats in a 4-week gavage study at doses up to 600 mg/kg-day (LOAEL not established). The only effect in several acute studies in rats was depressed serum cholinesterase activity following oral gavage of 250-1,500 mg/kg-day. In addition, no changes indicative of neurotoxicity were observed in an acute and a 90-day delayed neurotoxicity study in hens gavaged with analog chemical 2- Propanol, 1,3-dichloro-, phosphate (CASRN 13674-87-8).

Skin Sensitization (SnS) Group II* Score (H, M or L): L
V6 was assigned a score of LOW for skin sensitization based on a low score within the EPA's DfE Alternatives Assessment. This conclusion was based on all available studies presented within the DfE report for V6 not fulfilling the requirements of GHS Skin Sensitizer classification 1A or 1B. The low designation for skin sensitization in both GreenScreen and EPA's Alternatives Assessment is based on the same criteria. The score was based on study data within EPA's Alternatives Assessment and therefore is bolded within the GreenScreen assessment.

The summary provided within the EPA's Alternatives Assessment was as follows:

LOW: Phosphoric acid, P,P'-[2,2-bis(chloromethyl)-1,3-propanediyl] P,P,P',P'-tetrakis(2-chloroethyl) ester (V6) did not produce dermal sensitization in guinea pigs or in human volunteers. A single submitted confidential study reported mild skin sensitization in 17% of tested guinea pigs; however, these data could not be validated.

Respiratory Sensitization (SnR) Group II* Score (H, M or L): DG
V6 was assigned a score of data gap for respiratory sensitization. This conclusion was made based on no data located.

Skin Irritation/Corrosivity (IrS) Group II Score (vH, H, M or L): M
V6 was assigned a score of MODERATE for Skin Irritation/Corrosivity based on a low score within the EPA's DfE Alternatives Assessment. The DfE score is based on slight irritation (erythema, but no edema) in rabbits which resolved within 48 or 72 hours. The DfE's low dermal irritant score corresponds to a moderate score under GreenScreen Skin Irritation/Corrosivity. The score was based on study data within EPA's Alternatives Assessment and therefore is bolded within the GreenScreen assessment.

The summary provided within the EPA's Alternatives Assessment was as follows:
LOW: Phosphoric acid, P,P'-[2,2-bis(chloromethyl)-1,3-propanediyl] P,P,P',P'-tetrakis(2-chloroethyl) ester (V6) produced slight irritation (erythema, but no edema) in rabbits which resolved within 48 or 72 hours.

Eye Irritation/Corrosivity (IrE) Group II Score (vH, H, M or L): M
V6 was assigned a score of MODERATE based on a low score within the EPA's DfE Alternatives Assessment. The DfE score is based on slight conjunctival irritation in rabbits which resolved within 24 or 48 hours. The DfE low hazard score for eye irritation corresponds to a moderate score under GreenScreen Eye Irritation/Corrosivity. The score was based on test data within EPA's Alternatives Assessment and therefore is bolded within the GreenScreen assessment.

The summary provided within the EPA's Alternatives Assessment was as follows:
LOW: Phosphoric acid, P,P'-[2,2-bis(chloromethyl)-1,3-propanediyl] P,P,P',P'-tetrakis(2-chloroethyl) ester (V6) produced slight conjunctival irritation in rabbits which resolved within 24 or 48 hours.

Ecotoxicity (Ecotox)

Acute Aquatic Toxicity (AA) Score (vH, H, M or L): M
V6 was assigned a score of MODERATE for acute aquatic toxicity based on a moderate score within the EPA's DfE Alternatives Assessment. The moderate designation for acute aquatic toxicity in both GreenScreen and EPA's Alternatives Assessment is based on the same criteria. The score was based on study data and therefore is bolded within the GreenScreen assessment.

The summary provided within the EPA's Alternatives Assessment was as follows:

MODERATE: Based on experimental fish acute LC_{50} of 52 and a daphnid EC_{50} of 42 mg/L. Phosphoric acid, P,P'-[2,2-bis(chloromethyl)-1,3-propanediyl] P,P,P',P'-tetrakis(2-chloroethyl) ester (V6) is not acutely toxic to algae according to experimental studies.

Chronic Aquatic Toxicity (CA) Score (vH, H, M or L): *H*
V6 was assigned a score of HIGH chronic aquatic toxicity based on a high score within the EPA's DfE Alternatives Assessment. The high designation for chronic aquatic toxicity in both GreenScreen and EPA's Alternatives Assessment is based on the same criteria. The hazard score is based on expert judgment in the absence of chronic fish toxicity data and therefore is reported in italics within the GreenScreen assessment.

The summary provided within the EPA's Alternatives Assessment was as follows:
HIGH: Estimated based the estimated chronic aquatic toxicity value for fish of 0.022 mg/L (ECOSAR class: esters, phosphate). Experimental data indicate that 2,2-Bis(chloromethyl) trimethylene bis(bis(2- chloroethyl)phosphate (V6) does not produce chronic toxicity to daphnia and algae; in the absence of experimental data for fish, an estimated High hazard designation was assigned.

Environmental Fate (Fate)

Persistence (P) Score (vH, H, M, L, or vL): vH
V6 was assigned a score of VERY HIGH for persistence based on a high persistence score within the DfE report. The score was based on study data indicating a 5-37% biodegradation of V6 over 28 days in OECD testing. These results indicate a possible half-life of >60 in aqueous environments. A half-life greater than 60 days results in a Very High rating for persistence in water by GreenScreen. The hazard score is based on measured values within EPA's Alternatives Assessment and therefore is bolded within the GreenScreen assessment.

The summary provided within the EPA's Alternatives Assessment was summarized as follows:
HIGH: The persistence hazard designation for Phosphoric acid, P,P`-[2,2-bis(chloromethyl)-1,3-propanediyl] P,P,P`,P`-tetrakis(2-chloroethyl) ester (V6) is based on guideline biodegradation studies. There is evidence for biodegradation to occur at rates resulting in a high hazard designation. 37% removal was found in 28 days with an OECD 302C guideline study. Under aerobic conditions in ready biodegradability test OECD 301B, 5% biodegradation occurred after 28 days. This compound is relatively stable to hydrolysis, with experimental half-lives of >1 year at pH 4, pH 7, and pH 9. This compound is not expected to be susceptible to direct photolysis by sunlight, since it does not absorb light at wavelengths >290 nm. It is expected to be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 0.14 days.

Bioaccumulation (B) Score (vH, H, M, L, or vL): *vL*
V6 was assigned a score of VERY LOW for bioaccumulation based on a low score within the EPA's DfE Alternatives Assessment. The low designation for bioaccumulation in EPA's Alternatives Assessment is equivalent to a very low score in GreenScreen. The score is based on estimated study data and therefore is reported in italics within the GreenScreen assessment.

The summary provided within the EPA's Alternatives Assessment was as follows:
LOW: Based on estimated BCF and BAF values.

Physical Hazards (Physical)

Reactivity (Rx) Score (vH, H, M or L): *L*
V6 was assigned a score of LOW for reactivity based upon its use as a flame retardant, information available in a material safety data sheet and a review of potential degradation products. DfE does not assess reactivity and this data is added to the information found in the DfE alternatives assessment. For these reasons, V6 is assumed to be non-reactive. This conclusion was based on expert judgment and is reported in italics.

Flammability (F) Score (vH, H, M or L): *L*
V6 was assigned a score of LOW for flammability based its use as a flame retardant. This conclusion was based on expert judgment and is reported in italics.

Reactivity References:

Hamchem Material Safety Data Sheet (MSDS), V6, Product No. hm767663, Version 1.0, published 05/05/2009, 4 pages, Section 8: Stability and Reactivity '*Chemical Stability: Stable under recommended storage conditions*', accessed 11/16/2014.

European Union Risk Assessment 2,2-Bis(chloromethyl) trimethylene bis[bis)2-chloroethyl) phosphate] (V6), Cas No: 38051-10-4, EINECS No: 253-760-4, 262 pages, '.... *Unlikely to possess explosive properties ...unlikely to possess oxidising properties*'.

Expert judgment:

V6 is a halogenated phosphate compound which contains among other impurities a high (5-10% by weight) of the flame retardant TCEP. TCEP has been shown to be non-reactive. V6 is assumed to have similar reactivity and is assigned a low level of concern based upon professional judgment.

APPENDIX A: Hazard Benchmark Acronyms (alphabetical order)

(AA)	Acute Aquatic Toxicity
(AT)	Acute Mammalian Toxicity
(B)	Bioaccumulation
(C)	Carcinogenicity
(CA)	Chronic Aquatic Toxicity
(Cr)	Corrosion/ Irritation (Skin/ Eye)
(D)	Developmental Toxicity
(E)	Endocrine Activity
(F)	Flammability
(IrE)	Eye Irritation/Corrosivity
(IrS)	Skin Irritation/Corrosivity
(M)	Mutagenicity and Genotoxicity
(N)	Neurotoxicity
(P)	Persistence
(R)	Reproductive Toxicity
(Rx)	Reactivity
(SnS)	Sensitization- Skin
(SnR)	Sensitization- Respiratory
(ST)	Systemic/Organ Toxicity

Appendix B
Optional Exposure Stratified GreenScreen Hazard Summary Table

Exposure Route	GreenScreen Hazard Ratings: [*Chemical Name*]																			
	Group I Human					Group II and II* Human								Ecotox		Fate		Physical	
	C	M	R	D	E	AT	ST		N		SnS*	SnR*	IrS	IrE	AA	CA	P	B	Rx	F
							single	repeated	single	repeated†										
oral																				
dermal																				
inhalation																				

Appendix C
Modeling Results

Attach:

- **EPISuite Results for Chemical Name (CAS #)**
- **ECOSAR Results for Chemical Name (CAS #)**
- **Other**