CPF Associates, LLC

Environmental and Public Health Sciences

MEMORANDUM

TO: **Laura Haupert, OMI**
FROM: **Sarah Foster, CPF Associates, LLC**
DATE: **January 8, 2020**
RE: **Screening Health Assessment of Odor Control at Cannabis Greenhouses**

INTRODUCTION AND SUMMARY

OMI Industries manufactures odor control products which can be used to help mitigate odor issues, including odor issues associated with cannabis greenhouses and related facilities.

In December 2017, CPF Associates, LLC prepared a health assessment that evaluated the use of an OMI product, Ecosorb® CNB 100, in a waterless vapor phase odor control technology developed by Byers Scientific & Manufacturing. The Byers' technology produces a controlled release of the product in the vapor phase. The CPF health assessment was a screening-level evaluation that relied on conservative, health-protective assumptions to investigate the potential air impacts of CNB 100 relative to acute, short-term inhalation criteria derived to be protective of public health. The assessment showed that operation of the defined application scenario would not be expected to pose public health concerns. Potential air concentrations calculated using a screening-level model in the immediate vicinity of the distribution pipe were below available health-protective acute inhalation criteria.

Recently, OMI requested CPF Associates, LLC to conduct a follow-up health assessment of a similar product, Ecosorb® CNB 107, used in the Byers' odor control technology system. The application scenario was based on system configurations at several cannabis greenhouses in Santa Barbara County, CA. It assumed that Ecosorb® CNB 107 would be input at 7 gallons/day into the odor control technology and, once volatilized into a vapor, would be mixed with air from a 300 ft^3/min air blower through a 3,115-foot (949 m) distribution pipe encircling a greenhouse at a height of 10-15 feet (3.0-4.6 m). The product would then be released from upward-facing holes spaced at nine-foot intervals along the length of the pipe at an exit velocity of roughly 105 mph (154 ft/sec). The assessment evaluated emissions along the longest length of pipe on any one side of the building (1,113 feet or 339 m). The composition of CNB 107 was provided to CPF by OMI Industries, under the understanding that this is confidential business information.

The follow-up health assessment evaluated potential air impacts relative to chronic and acute inhalation criteria derived to be protective of public health. The assessment was a screening-level evaluation that relied on conservative, health-protective assumptions. These assumptions are expected to overestimate potential air concentrations, exposures and risks associated with the evaluated scenario.

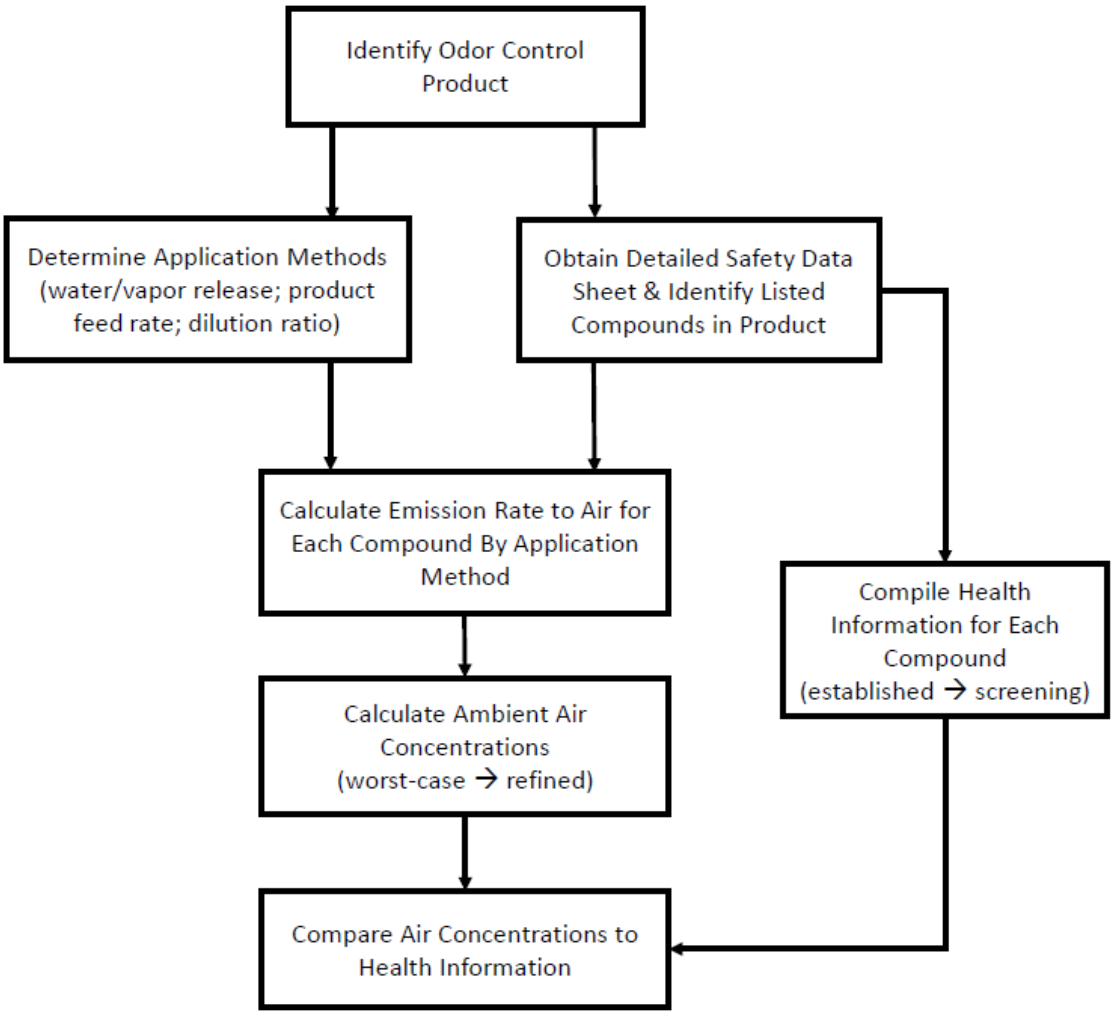
The assessment showed that, based on the methods and assumptions used, operation of the evaluated application scenario would not be expected to pose public health concerns. Potential air concentrations calculated using a screening-level model in the immediate vicinity of the distribution pipe were below available health-protective acute and chronic inhalation criteria.

SCREENING HEALTH ASSESSMENT

Methodology

CPF has developed a methodology to evaluate odor control product use at landfills and other potentially odiferous facilities. This methodology is based on well-accepted health risk assessment principles and has been used to objectively assess more than two dozen odor control products delivered using a variety of application systems. A flow chart of the methodology is provided in Figure 1. Broadly defined, the methodology combines information about odor control product composition, odor control application methods, health effects information and modeled ambient air concentrations to evaluate the potential for public health concerns via inhalation.

Figure 1
Overview of Odor Control Product Health Assessment Methodology



Consistent with standard health risk assessment practice, the methodology can be applied in a stepwise fashion of increasing refinement, as warranted. The initial screening-level evaluation employs conservative, health-protective assumptions which are intended to overestimate potential air concentrations, exposures and potential risks. If the screening-level results do not show a potential health concern, then no further assessment is needed. If not, more refined evaluations can be performed to further evaluate an odor control system under more realistic conditions.

Assessment of Vapor Phase Odor Control System

Application Scenario

This screening-level assessment addressed an application scenario based on actual system configurations at several cannabis greenhouses in Santa Barbara County, CA. The configurations at greenhouses were provided to CPF by Byers Scientific. It was assumed that Ecosorb® CNB 107 would be fed into the vapor phase odor control technology at a rate of 7 gallons per day and, once volatilized, would be distributed as a vapor through a distribution pipe encircling a greenhouse. Air flow through the pipe would be generated by a fan set at 300 standard cubic feet per minute (8.5 m^3/min) and the product would be released from upward-facing holes, each roughly 1/8" in diameter (3.2 mm), spaced at nine-foot (2.7 m) intervals along the length of the pipe. Due to the pressure created by the fan, the vapor is expected to be emitted at a velocity of roughly 105 mph (154 ft/sec or 47 m/sec) from each hole. The pipe would be placed around the outside perimeter of the building at a height of 10-15 feet (3.0-4.6 m). The total pipe length encircling the building was assumed to be 3,115 feet (949 m). The assessment evaluated emissions along the longest length of pipe on any one side of the building (1,113 feet or 339 m).

Odor Control Product

The odor control product evaluated was Ecosorb® CNB 107, the latest cannabis specific odor neutralizing formula. Its composition was provided to CPF by its manufacturer, OMI Industries, under the understanding that this is confidential business information. The detailed composition of the product used in this assessment was based on an analysis of Ecosorb® CNB 107 using a Gas Chromatography-Mass Spectrometer (GCMS) which allowed for a complete identification of all substances present in the product. The detailed GCMS analysis identified 27 compounds which were all carried through this assessment. [1] A review of the ingredients in a similar odor control product, Ecosorb® CNB 100, by the Santa Barbara County Air Pollution Control District (APCD) confirmed that none are considered toxic air contaminants (TACs) as identified by the State of California.[2] The CNB 107 formula has also been provided under terms of confidentiality to the Santa Barbara County APCD which is currently conducting its own independent review. In general, the product is comprised of two polysorbate surfactants and a blend of plant oils with the remainder being water. Both polysorbate surfactants are widely used in hundreds of industrial, consumer, medicinal and personal care products. The Safety Data Sheet (SDS) for CNB 107 is provided in Attachment A. This

[1] The composition of Ecosorb CNB 107 is a proprietary trade secret, however, the GCMS results were provided to CPF for the purposes of this analysis. In accordance with a Confidentiality Agreement, this composition data is not specifically provided in this memo.

[2] Santa Barbara County Air Pollution Control District (SBCAPCD). 2091. APCD Incompleteness Items for Casitas Greenhouse LLC. Letter from D. Ho, Air Quality Specialist to M. Esparza, Santa Barbara County Planning and Development. June 25, 2019.

SDS includes information about the product, its hazards and instructions for handling, disposal, transport, first-aid, fire-fighting and exposure control measures.

Emission Rates into Air

Emission rates into air for the product as a whole and its individual constituents were calculated based on the application setup described above and the Ecosorb® CNB 107 composition. The method for calculating emission rates was designed to ensure that potential air impacts would be overestimated in the interest of health protectiveness. First, it was assumed that 100% of the product would be volatilized in the odor control technology and transported down the distribution pipe. Second, the calculated emission rates from all holes along the longest length of pipe on any one side of the building (124 holes along a 1,113-foot length of pipe) were summed and the resulting cumulative emission rate was then assumed to be released from one concentrated location, rather than dispersed along the long distribution pipe. These assumptions are expected to overestimate potential emission rates, and thus also air concentrations.

Ambient Air Concentrations

Potential air concentrations were calculated in the immediate vicinity of the distribution pipe using a screening method called a box model. This approach assumes that emissions are completely mixed in a box having a specified width and height through which wind is blowing.[3] It is generally considered more likely to overestimate than underestimate concentrations because the model does not take into account air mixing and dispersion outside the box, atmospheric reactions or settling (deposition). All of these processes, which naturally occur in the outdoor environment, would result in lower concentrations than those modeled. Moreover, the simple box model does not take into account the upward-facing, high velocity of the emissions (i.e., roughly 154 ft/sec), which would result in enhanced mixing and dispersion in air. As a result, the air concentrations due to emissions are expected to be overestimated.

For this assessment, the box was defined to conservatively estimate potential air concentrations that might occur in the immediate vicinity of the distribution pipe (i.e., within roughly 15 feet). It was assumed to extend outward 15 feet (4.57 m) from the side of the building and upwards to a building height of 15 feet (4.57 m), with air flowing through this cross-section at a velocity of 1 mile per hour (0.447 m/sec), representative of a calm wind speed. Air concentrations would be lower if a larger box and higher wind speed were used.[4]

Health Criteria for Odor Control Product

The next step in the assessment involved compilation of available health criteria for the constituents in the product. These criteria reflect concentrations in air (in mg/m^3) or acceptable daily intakes (in mg/kg body weight/day) that are protective of public health. They are developed by regulatory agencies and public health scientists based on scientific information about the toxicity of chemical

[3] American Society for Testing and Materials (ASTM). 1994. Emergency Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites. Philadelphia, PA. ES 38-94.

[4] The equation for calculating air concentrations in the simple well-mixed box model is: $Ca = (ER*1{,}000)/(H*W*V)$, where Ca = Air concentration (mg/m^3), ER = Emission rate (g/sec), 1,000 = Conversion factor (1,000 mg/g), H = Box height (5.5 m), W = Box width (4.57 m), and V = Air velocity through box (0.447 m/sec).

substances. When these values are derived, safety factors are generally incorporated to ensure that they are protective of human health.

Numerous information sources were searched to identify available health effects criteria.[5] Identifying health criteria for the constituents in CNB 107 was, however, challenging because the compounds are common flavorings, food additives or surfactants that are widely present in industrial, consumer, medicinal and personal care products and none of the compounds are included in traditional US databases relied on for inhalation health assessments.[6] Chronic inhalation criteria were able to be identified for all but two of the constituents in Ecosorb® CNB 107 - either for the listed compound itself, a chemical class representative of the compound, or for a structurally similar compound. These chronic, long-term inhalation health criteria were derived no effect levels (DNELs) for inhalation exposure for the general public from the European Chemicals Agency (ECHA). The DNELs are defined as safe exposure levels (i.e., the level of exposure above which a human should not be exposed to a substance), and they are developed following guidance provided by ECHA which requires incorporation of adjustment (safety) factors to ensure the DNELs are protective of public health.[7] Chronic health criteria for two constituents (the surfactants) were available only as oral acceptable daily intakes (i.e., doses in mg/kg/day rather than air concentrations in mg/m^3). Acute, short-term inhalation criteria were able to be identified for most but not all of the constituents, again either for the listed compound itself, a chemical class representative of the compound, or for a structurally similar compound. Most of the acute, short-term inhalation criteria were Temporary Emergency Exposure Limits (TEELs) derived by the Department of Energy's Subcommittee on Consequence Assessment and Protective Actions (SCAPA), as no values were provided in two other more commonly used databases.[8] The TEELs reflect the airborne concentration of a substance below which the general population, including susceptible individuals, is not expected to experience adverse effects from a one-hour or more inhalation exposure (e.g., mild, transient effects such as irritation).[9]

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[5] Information sources searched included: California Environmental Protection Agency (CALEPA) Reference Exposure Levels (RELs), US Environmental Protection Agency's (USEPA) Integrated Risk Information System (IRIS) and Risk-Based Screening Levels (RSLs), Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs), USEPA's Acute Exposure Guideline Levels (AEGLs), American Industrial Hygiene Association's Emergency Response Planning Guidelines (ERPGs), Temporary Emergency Exposure Limits (TEELs) developed by the DOE Office of Emergency Management, US National Library of Medicine PubChem databases, derived no effect levels (DNELs) for inhalation exposure for the general public from the European Chemicals Agency (ECHA), European Food Safety Authority (EFSA) assessments on food additives, Safety Assessments prepared by the Research Institute For Fragrance Materials and by Cosmetic Ingredient Review Expert Panels, and Japan Food Safety Commission reports on food additives.

[6] None of the constituents in CNB 107 are included in the California Environmental Protection Agency (CALEPA) list of Reference Exposure Levels (RELs), the US Environmental Protection Agency's (USEPA) Integrated Risk Information System (IRIS), USEPA's Risk-Based Screening Levels (RSLs) tables or the Agency for Toxic Substances and Disease Registry (ATSDR) list of Minimum Risk Levels (MRLs).

[7] European Chemicals Agency (ECHA). 2012. Guidance on information requirements and chemical safety assessment. Chapter R.8: Characterization of dose [concentration]-response for human health; and European Centre for Ecotoxicology and Toxicology of Chemicals (ECETOC). 2010. Guidance on Assessment Factors to Derive a DNEL. ECETOC Technical Report No. 110. October 2010.

[8] None of the constituents in CNB 107 are included in USEPA's Acute Exposure Guideline Levels (AEGLs) database or the American Industrial Hygiene Association's Emergency Response Planning Guidelines (ERPGs).

[9] https://www.energy.gov/ehss/protective-action-criteria-pac-aegls-erpgs-teels-rev-29-chemicals-concern-may-2016

In addition to identifying criteria for constituents in Ecosorb® CNB 107, the results from acute inhalation toxicity studies were used to derive an acute inhalation criterion for the product as a whole. Acute inhalation toxicity studies have been conducted for two Ecosorb® products that are very similar to CNB 107 (Ecosorb® 606 and Ecosorb® 206). The acute inhalation toxicity studies examined the occurrence of adverse effects on rats exposed to each product for four hours at a high concentration in aerosolized form (2,220 mg/m^3 for Ecosorb® 606 and 2,080 mg/m^3 for Ecosorb® 206). Observations of the test animals for 12 different health endpoints were tabulated during the exposure period and for 14 days after the exposure ceased, and no adverse effects were observed at either tested air concentration. [10] The lowest of the two no observed adverse effect levels (NOAELs) was divided by an uncertainty factor of 100 to derive the acute inhalation criterion for this assessment (21 mg/m^3). [11] This criterion is likely to overstate potential risks because the actual NOAEL may be much higher than the single tested exposure level.

Compare Air Concentrations to Health Criteria

The potential for a health concern was evaluated by comparing the calculated air concentrations to the health criteria. If the calculated air concentration for a compound or odor control product is lower than the corresponding inhalation health criterion, adverse public health effects would not be expected to occur under the assumed odor control application scenario. If an air concentration exceeds its criterion, this does not mean that adverse effects would occur among the general public because of the conservative assumptions included in both the derivation of the criterion and the calculation of air concentrations. Rather it indicates that further investigation may be warranted, using more refined and realistic assumptions, to help determine whether or not levels in air may present a potential public health concern.

The potential air concentrations calculated in the immediate vicinity of the distribution pipe were all below the available health-protective criteria. As noted above, the air concentrations were calculated using a screening-level box model, assuming emissions from 124 holes along a 1,113-foot length distribution pipe would all be released from one concentrated location on the side of a building. The calculated air concentrations of the individual constituents in CNB 107 were 10 to more than 33,000 times lower than their respective chronic criteria, and 148 to more than 89,000 times lower than their acute inhalation criteria. The calculated air concentration of the product as a whole was 1.8 times lower than its acute inhalation criterion.

Discussion of Uncertainties

The results of health assessments inherently reflect some uncertainty because of the complexities involved in the analysis. In accordance with standard practice, key uncertainties affecting this assessment are discussed here. In general, uncertainties in health assessments, including this one,

[10] The acute inhalation toxicity tests were conducted by Tox Monitor Laboratories, Inc. (Oak Park, IL) according to guidelines from the US Environmental Protection Agency (Health Effects Test Guidelines, OPPTS 870.1300, Acute Inhalation Toxicity, August 1998) and the Organization for Economic Cooperation and Development (OECD Guidelines for the Testing of Chemicals, Test No. 403: Acute Inhalation Toxicity, September 2009). These guidelines include monitoring tested animals for a wide variety of effects including, for example, changes in eyes and mucous membranes, respiratory and nervous systems effects, and behavior patterns.

[11] Consistent with screening-level methods for deriving reference air concentrations, the uncertainty factor of 100 incorporated one factor of 10 for animal to human extrapolation and another factor of 10 for human variability.

are addressed by using conservative (i.e., health protective) assumptions which collectively produce results much more likely to be overestimated than underestimated. This adds a margin of safety to the results.

There were several very conservative assumptions used in this assessment that will overestimate air concentrations and thus health impact results. Emissions from 124 holes spread out along a long 1,113-foot distribution pipe were summed, and this cumulative emission was then assumed to be released from a concentrated single location. It was also assumed that each constituent would be completely (100%) volatilized in the odor technology system. Small dimensions (i.e., 15 feet by 15 feet) were assigned to the simple box model and a very low wind speed was used for mixing in the box. The box model does not take into account air mixing and dispersion outside the box, atmospheric reactions or deposition, or the high velocity of the emissions, all processes that would tend to lower air concentrations.

The health criteria used to evaluate the calculated air concentrations were obtained from a variety of public health and research organization data sources. Each criterion incorporated adjustment factors in its derivation to help ensure protection of public health. Acute inhalation criteria were not able to be identified for some of the constituents identified in the GCMS analysis, however, this limitation was offset by the availability of an acute inhalation criterion derived for the product as a whole based on a NOAEL from an acute inhalation toxicity study. The calculated air concentration for the product as a whole in the immediate vicinity of the distribution pipe was 1.8 times lower than its acute inhalation criterion indicating that, even with the many conservative assumptions noted above, potential short-term exposure would be below a level of concern. And this result is likely to be further overestimated because the acute toxicity study evaluated only one exposure level at which there were no adverse effects, meaning that the actual NOAEL, and thus the health criterion, could be much higher.

Some uncertainties could not be explicitly addressed in this study, such as whether the form of emissions might vary in sub-freezing temperatures (e.g., vapor versus aerosols), whether the composition of volatilized constituents might vary after long periods of operation and the effect of buildings on dispersion and mixing of emissions. Potential air concentrations were, however, calculated along one side of a long building using a simple screening-level box model with very conservative input assumptions; more refined calculations of potential air concentrations could be estimated using more sophisticated methods (e.g., refined air dispersion modeling, wind tunnel modeling or computational fluid dynamic modeling). Overall, these uncertainties are not expected to change the conclusions of this assessment.

This assessment addressed only the inhalation route of exposure with a focus on the general public. Not considering other exposure routes (e.g., dermal) is appropriate given that the general public would not be expected to come into contact with the odor control product in any manner other than through the air. With respect to occupational situations, which were not addressed here, this product should only be used in accordance with its SDS, any label instructions, and regulatory requirements of Cal/OSHA.

Conclusions

Based on the methods and assumptions used, this screening-level assessment showed that the evaluated application scenario of the Byers' odor control technology system using Ecosorb® CNB 107 would not be expected to pose public health concerns. Potential air concentrations calculated using a screening-level model in the immediate vicinity of a distribution pipe were below available health-protective chronic and acute inhalation criteria. The calculated air concentrations of the individual constituents in CNB 107 were 10 to more than 33,000 times lower than their respective chronic criteria, and 148 to more than 89,000 times lower than their acute inhalation criteria. The calculated air concentration of the product as a whole was 1.8 times lower than its acute inhalation criterion. In general, the methods and assumptions used in this analysis were conservative (i.e., health protective) and, therefore, the results are much more likely to be overestimated than underestimated.

ABOUT CPF ASSOCIATES, LLC

CPF Associates, LLC is an independent Maryland-based scientific and research consulting firm with in-depth experience and expertise in the health and environmental evaluation of air emission sources, waste management technologies, industrial facilities and waste sites. The principal investigator was Ms. Sarah Foster, Founder of CPF Associates, LLC. CPF applies well-accepted scientific tools to address public health and environmental issues. In over 35 years of professional consulting, Ms. Foster has conducted dozens of projects for energy-from-waste (EfW) facilities, landfills, hazardous waste incinerators, medical waste incinerators, biosolids management facilities, recycling plants, transfer stations and hazardous waste sites. She has also conducted odor control product health assessments for over two dozen different products and application scenarios. Previous to CPF Associates, LLC, Ms. Foster was a Principal and Founding Partner of CPF Associates, Inc., a Senior Consultant with The Weinberg Group, a Project Manager with Clement Associates/ICF Consulting, a Data Reviewer for the Six Cities Study at Harvard School of Public Health, and an Environmental Protection Specialist at the US Environmental Protection Agency.

ATTACHMENT A

SAFETY DATA SHEET

ECOSORB CNB 107

Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
Date of issue: 04/04/2019 Revision date: 12/23/2019 Version: 1.1

SECTION 1: Identification

1.1. Identification

Product form : Mixture

Product name : ECOSORB CNB 107

1.2. Recommended use and restrictions on use

Use of the substance/mixture : Odor Neutralizer

Recommended use : Odor Neutralizer

Restrictions on use : None known

1.3. Supplier

Manufacturer
OMI Industries
1300 Barbour Way
Rising Sun, IN 47040 - U.S.A
T 1-847-304-9111

1.4. Emergency telephone number

Emergency number : 1-800-662-6367, Monday - Friday 8 am to 5 pm CST

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS US classification
Not classified

2.2. GHS Label elements, including precautionary statements

GHS US labeling
No labeling applicable

2.3. Other hazards which do not result in classification

Other hazards not contributing to the classification : None under normal conditions. Keep out of reach of children.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

This mixture does not contain any substances to be mentioned according to the criteria of section 3.2 of HazCom 2012

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general : Call a poison center/doctor/physician if you feel unwell.

First-aid measures after inhalation : Move to fresh air if necessary.

First-aid measures after skin contact : Wash skin with plenty of water.

First-aid measures after eye contact : Rinse eyes with water as a precaution.

First-aid measures after ingestion : Call a poison center/doctor/physician if you feel unwell.

4.2. Most important symptoms and effects (acute and delayed)

Potential Adverse human health effects and symptoms : No other effects known.

Expected Symptoms/Effects, Acute and Delayed : No known effects from this product.

Symptoms/effects : None under normal use.

Symptoms/effects after inhalation : No effects known.

Symptoms/effects after skin contact : No effects known.

Symptoms/effects after eye contact : No effects known.

Symptoms/effects after ingestion : No effects known.

Symptoms/effects upon intravenous administration : No other effects known.

4.3. Immediate medical attention and special treatment, if necessary

Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Dry powder. Foam. Carbon dioxide.

Unsuitable extinguishing media : No unsuitable extinguishing media known.

5.2. Specific hazards arising from the chemical

Fire hazard : Not flammable.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Cool tanks/drums with water spray/remove them into safety.

Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Stop leak if safe to do so.

6.1.1. For non-emergency personnel

Protective equipment : Gloves and safety glasses recommended.

Emergency procedures : Ventilate spillage area.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Avoid release to the environment. Prevent liquid from entering sewers, watercourses, underground or low areas.

6.3. Methods and material for containment and cleaning up

For containment : Collect spillage.

Methods for cleaning up	: Take up liquid spill into absorbent material.
Other information	: Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 13. For further information refer to section 8: "Exposure controls/personal protection".

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling	: Ensure good ventilation of the work station. Wear personal protective equipment.
Hygiene measures	: Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures	: Does not require any specific or particular technical measures.
Storage conditions	: Store in a well-ventilated place. Keep cool.
Incompatible products	: Oxidizing agent. Strong acids.
Incompatible materials	: Keep away from strong acids and strong oxidizers.
Storage temperature	: 4 - 29 °C 40°F and 85°F Allowing product to freeze may cause layering.
Heat-ignition	: KEEP SUBSTANCE AWAY FROM: heat sources. ignition sources.
Information on mixed storage	: KEEP SUBSTANCE AWAY FROM: (strong) acids. oxidizing agents.
Storage area	: Keep container in a well-ventilated place. Store in a cool area. Keep out of direct sunlight. Store in a well-ventilated place.
Special rules on packaging	: Keep only in original container.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Appropriate engineering controls

Appropriate engineering controls	: Ensure good ventilation of the work station.
Environmental exposure controls	: Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Gloves and safety glasses recommended.

Hand protection:

Protective gloves. Recommended

Eye protection:

Safety glasses. Recommended

Skin and body protection:

None under normal use

Respiratory protection:

Respiratory protection not required in normal conditions

Thermal hazard protection:

Not applicable.

Other information:

Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: White liquid.
Color	: White
Odor	: Characteristic odour
Odor threshold	: No data available
pH	: 5 - 8.5
Melting point	: Not applicable
Freezing point	: No data available
Boiling point	: ≈ 99 °C
Flash point	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Flammability (solid, gas)	: Not applicable.
Vapor pressure	: No data available
Relative vapor density at 20 °C	: No data available
Relative density	: ≈ 0.99
Solubility	: Soluble in water.
Partition coefficient n-octanol/water	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, kinematic	: ≈ 1.1 cSt
Viscosity, dynamic	: No data available
Explosion limits	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

Oxidizing agent. Strong acids.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Not classified
Skin corrosion/irritation	: Not classified pH: 5 - 8.5
Serious eye damage/irritation	: Not classified pH: 5 - 8.5
Respiratory or skin sensitization	: Not classified.
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
STOT-single exposure	: Not classified
STOT-repeated exposure	: Not classified
Aspiration hazard	: Not classified
Viscosity, kinematic	: ≈ 1.1 cSt
Likely routes of exposure	: Inhalation. Dermal.
Potential Adverse human health effects and symptoms	: No other effects known.
Expected Symptoms/Effects, Acute and Delayed	: No known effects from this product.
Symptoms/effects	: None under normal use.
Symptoms/effects after inhalation	: No effects known.
Symptoms/effects after skin contact	: No effects known.
Symptoms/effects after eye contact	: No effects known.
Symptoms/effects after ingestion	: No effects known.
Symptoms/effects upon intravenous administration	: No other effects known.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	: The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.

12.2. Persistence and degradability

ECOSORB CNB 107	
Persistence and degradability	Biodegradability in water: no data available.

12.3. Bioaccumulative potential

ECOSORB CNB 107	
Bioaccumulative potential	Not established.

12.4. Mobility in soil

ECOSORB CNB 107	
Ecology - soil	The product is predicted to have high mobility in soil. Soluble in water.

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods

Regional legislation (waste) : Disposal must be done according to official regulations.

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.

Sewage disposal recommendations : Disposal must be done according to official regulations.

Product/Packaging disposal recommendations : Avoid release to the environment.

Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Not applicable

Transportation of Dangerous Goods

Not applicable

Transport by sea

Not applicable

Air transport

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

15.2. International regulations

CANADA

ECOSORB CNB 107
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

ECOSORB CNB 107
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

National regulations

ECOSORB CNB 107
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on INSQ (Mexican National Inventory of Chemical Substances)

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision date : 12/23/2019

Training advice : Normal use of this product shall imply use in accordance with the instructions on the packaging.

Other information : None.

Abbreviations and acronyms:		
	ATE	Acute Toxicity Estimate
	BCF	Bioconcentration factor
	IATA	International Air Transport Association
	IMDG	International Maritime Dangerous Goods
	LC50	Median lethal concentration
	IARC	International Agency for Research on Cancer
	OECD	Organisation for Economic Co-operation and Development
	LD50	Median lethal dose
	SDS	Safety Data Sheet
	STP	Sewage treatment plant

Hazard Rating

Health : 0 Minimal Hazard - No significant risk to health

Flammability : 0 Minimal Hazard - Materials that will not burn

Physical : 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

Personal protection : B

B - Safety glasses, Gloves

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.