# ENVIRONMENTAL ASSESSMENT

**1. Date:** April 27, 2023

**2. Name of Applicant:** Alcresta Therapeutics, Inc.

**3. Address:** 130 Turner Street, Building 3, Suite 200
Waltham, MA 02543

All communications on this matter are to be sent in care of Counsel for Notifier:

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## 4. Description of the Proposed Action

The action requested in this notification is the establishment of a clearance to permit the use of ethylene glycol dimethacrylate (EGDMA), butyl methacrylate (BMA), and glycidyl methacrylate (GMA) copolymer (hereinafter the food-contact substance or FCS) as a fixing agent for the immobilization of a lipase enzyme that is considered generally recognized as safe (GRAS). The FCS-enzyme complex (FEC) is intended for single-use in contact with the Food and Drug Administration's (FDA) Food Type IV-B (Dairy products and modifications: Oil-in-water emulsions, high- or low-fat) under Condition of Use E (Room temperature filled and stored (no thermal treatment in the container)).[1]

The FCS will be used in producing a finished cartridge manufactured exclusively by the Notifier for people who have difficulties in obtaining nutrients from normal diets. For example, one potential application of the FCS involves the immobilization of a lipase enzyme that is designed to help people who are exocrine pancreatic insufficient or suffer from fat malabsorption. The application is already covered by Alcresta, Inc.'s effective Food Contact Notification (FCN) 1498. Specifically, as fatty acids are susceptible to oxidation, it is challenging to produce pre-hydrolyzed fat products in large scale and distribute them later for human consumption. The FCS can immobilize lipase and offers a practical solution by hydrolyzing fats into fatty acids and mono-glycerides just before consumption for people who have fat digestion impairments. The FCS will be conveniently contained within a cartridge that will be attached to a tube feeding line and intended for use primarily at home or in institutional environments. The notifier does not intend to sell the FCS to other manufacturers engaged in the

[1] FDA's Food Types and Conditions of Use are described at https://www.fda.gov/food/packaging-food-contact-substances-fcs/food-types-conditions-use-food-contact-substances.

production of food-contact applications. It is anticipated that the FCS will be utilized in patterns corresponding to the national population density and will be widely distributed across the country.

According to U.S. Environmental Protection Agency (EPA) data for 2018, approximately 50.0% of municipal solid waste (MSW) is currently deposited in land disposal sites, 11.8% is combusted, 23.6% is recycled, 8.5% is composted, and 6.1% is directed to other food management pathways.[2] The cartridge containing the FCS will not be recyclable or reusable. Because the cartridge is not recycled, we estimate that it will be placed in landfills and combusted in the same general proportion as the overall plastic waste stream. As such, we estimate that approximately 19.1% of the cartridges containing the FCS will be combusted annually while the remaining 80.9% will be landfilled.[3]

The types of environments present at and adjacent to the disposal locations are the same as the disposal of any other food-contact material in current use. Consequently, there are no special circumstances regarding the environment surrounding either the use or disposal of the FCS.

## 5. Identification of Chemical Substance that is the Subject of the Proposed Action

The subject of this notification is the reaction product of EGDMA (CAS Reg. No. 97-90-5), BMA (CAS Reg. No. 97-88-1), and GMA (CAS Reg. No. 106-91-2). The CAS Registry Number associated with the FCS is 133396-60-8.

## 6. Introduction of Substances into the Environment

The Notifier intends to produce the FCS at contract manufacturers' facilities located in the European Union (EU) that are operated in compliance with all local environmental laws and regulations. Information available to the Notifier does not suggest that there are any extraordinary circumstances, such as described under 21 C.F.R. § 25.21(a) and (b), that are in this case indicative of any adverse environmental impact as a result of the manufacture of the FCS.

No environmental release is expected upon the use of the FCS. After each use, the entire cartridge system containing the FCS beads will be discarded. Disposal by the consumers of the

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[2] *Advancing Sustainable Materials Management: 2018 Fact Sheet. Assessing Trends in Materials Generation and Management in the United States,* U.S. Environmental Protection Agency, Office of Land and Emergency Management, Dec. 2020, *see* https://www.epa.gov/sites/production/files/2021-01/documents/2018_ff_fact_sheet_dec_2020_fnl_508.pdf.

[3] 11.8% combusted ÷ (11.8% combusted + 50.0% land disposed) = 19.1% combusted. The remaining 80.9% will be land-disposed.

cartridge will be by conventional rubbish disposal and, hence, primarily by sanitary landfill and combustion.

The FCS is a polymer composed exclusively of carbon, oxygen, and hydrogen, all elements that are commonly found in municipal solid waste. The products of complete combustion are water and carbon dioxide. As discussed in more detail in the confidential attachment, the estimated market volume of the FCS constitutes a *de minimis* fraction of the total plastic materials to be landfilled or combusted.

To evaluate the significance of the environmental impact of this notification becoming effective, we considered whether the action threatens a violation of Federal, State, or local laws or requirements imposed for the protection of the environment. In this context, 40 C.F.R. § 98.2(a)(3) requires stationary fuel combustion sources which emit 25,000 metric tons (MT) $CO_2$ equivalents ($CO_2$-e) or more per year to report their greenhouse gas (GHG) emissions to the U.S. Environmental Protection Agency (EPA). MSW combustion facilities are stationary fuel combustion sources pursuant to 40 C.F.R. 98.30(a). The GHG emissions resulting from the use and disposal of the FCS relate to the incineration of articles containing the FCS in MSW combustion facilities. Such facilities are regulated by EPA under 40 C.F.R. § 98, which "establishes mandatory GHG reporting requirements for owners and operators of certain facilities that directly emit GHG." Part 2 of this regulation (40 C.F.R. § 98.2) describes the facilities that must report GHG emissions and sets an annual 25,000 metric ton carbon dioxide equivalent ($CO_2$-e) emission threshold for required reporting.

Based on the confidential market volume, the expected $CO_2$-e emissions, as shown in the confidential attachment to the EA, are far below 25,000 metric tons on an annual basis. As the estimated GHG emissions are below the threshold for mandatory reporting, no significant environmental impacts are anticipated resulting from combustion of the FCS in MSW combustion facilities. Further, the FCS will not significantly alter the emissions from properly operating MSW combustors, as the FCS contains elements that are commonly found in MSW. Therefore, incineration of the FCS will not cause MSW to threaten a violation of applicable emission laws and regulations (*i.e.,* 40 C.F.R. Parts 60 and 98, and/or relevant state and local laws). Accordingly, no significant adverse environmental impacts are anticipated resulting from the combustion of the FCS in MSW combustion facilities.

Only extremely small amounts, if any, of the FCS constituents are expected to enter the environment as a result of the landfill disposal of used cartridges containing the FCS. EPA regulations require all solid-waste landfill units and lateral expansions of existing units to have composite liners and leachate collection systems to prevent leachate from entering ground and surface water and to have ground-water monitoring systems (40 C.F.R. Part 258). These requirements are enforced by state solid-waste management programs. Therefore, based on MSW landfill regulations preventing leaching and state enforcement of these requirements, the FCS is not expected to reach the aquatic or terrestrial environment when disposed of via landfill.

## 7. Fate of Emitted Substances in the Environment

### A. Air

No significant effect on the concentrations of and exposures to any substances in the atmosphere is anticipated due to the proposed use of the FCS. The FCS is a solid polymer and does not volatilize. Thus, no significant quantities of any substances will be released upon the use and disposal of cartridges manufactured with the FCS. The complete combustion of the FCS will produce carbon dioxide and water. As discussed above in Item 6, the FCS will make up a very small portion of the total MSW currently combusted, will not significantly alter the emissions from properly operating MSW combustors, and will not cause MSW combustors to threaten a violation of applicable emissions laws and regulations when it is incinerated.

### B. Water

As discussed in Item 6, no significant quantities of any substance will be added to fresh water, estuarine, or marine ecosystems upon the proper incineration of the FCS, nor upon its disposal in landfills. Thus, no significant effects on the concentrations of and exposures to any substances are anticipated as a result of the proposed use of the subject FCS.

### C. Land

No significant effects on the concentrations of and exposures to any substances in terrestrial ecosystems are anticipated as a result of the proposed use of the subject FCS. The FCS is a solid, spherical macromolecule. It is insoluble in acid, base, aqueous liquids, and organic solvents (*e.g.*, tetrahydrofuran and chloroform). Given the nature of the FCS, it is expected that there will be virtually no leaching of the components of the FCS under normal environmental conditions when the cartridges are disposed. The polyethylene membranes prevent the FCS from migrating out of the cartridge. The FCS is also thermally stable under the intended conditions of use (*i.e.*, room temperature). Further, given the very small volume of the FCS that will be landfilled (discussed in the confidential attachment), there is no expectation of any meaningful exposure of terrestrial organisms to these substances as a result of the proposed use of the FCS.

Considering the foregoing, we respectfully submit that there is no reasonable expectation of a significant impact on the concentration of any substance in the environment due to the proposed use of the FCS. As no significant introduction of substances into the environment as a result of the proposed use of the FCS were identified as discussed under Item 6, the environmental fate of such substances does not need to be addressed.

## 8. Environmental Effects of Released Substances

As discussed previously, the only substances that may be expected to be released to the environment upon the use and disposal of the cartridges fabricated with the FCS consist of extremely small quantities of combustion products and extractables, if any. Thus, no adverse effect on organisms in the environment is expected as a result of the disposal of articles containing the FCS. In addition, the use and disposal of finished articles containing the FCS are not expected to threaten a violation of applicable laws and regulations, such as EPA's regulations

in 40 C.F.R. Parts 60 and 98 that pertain to MSW combustors or Part 258 that pertains to landfills.

## 9. Use of Resources and Energy

As with other food-contact materials, the production, use, and disposal of the FCS involve the use of natural resources such as petroleum products and coal. If allowed to become effective, this FCN is expected to result in an increase in the total quantity of the FCS that is produced and used in the intended application beyond the level currently used under FCN 1498; however, unlike typical food contact substances, the subject FCS is intended for use in a finished medical device and, therefore, will be used by only a small subset of the overall population. As a result, the total quantity (mass) of FCS used in the intended application will remain small – as evidenced by the market information in the confidential attachment – and the amount of resources and energy required to produce, use, and dispose of the final product will be correspondingly low. Thus, no significant increase in total usage of energy or other resources is expected to result from this action.

The cartridges that contain the FCS are not expected to be recycled. Thus, there will be no impact on recycling programs.

## 10. Mitigation Measures

The intended use of the FCS is not reasonably expected to create new environmental impacts that would require mitigation measures of any kind. Thus, no mitigation measures are necessary.

## 11. Alternatives to the Proposed Action

There are no significant adverse environmental effects identified herein that would necessitate alternative actions to that proposed in this FCN. The alternative of not approving this FCN would simply result in the continued use of similar applications, such as that authorized under FCN 1498; such action would, therefore, have no significant environmental impact.

## 12. List of Preparers

Rachel A. Bond, Counsel for Notifier, Keller and Heckman LLP, 1001 G Street, N.W., Suite 500 West, Washington, DC 20001. Ms. Bond has a J.D., with many years of experience drafting FCN submissions and environmental assessments.

Holly H. Foley, Staff Scientist, Keller and Heckman LLP, 1001 G Street, N.W., Suite 500 West, Washington, DC 20001. Ms. Foley has over 35 years of experience drafting food additive petitions, 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 her knowledge.

Date: April 27, 2023

Rachel A. Bond, Counsel for Notifier
Alcresta Therapeutics, Inc.

## 14. References

The following footnotes are found within the Environmental Assessment document:

1. FDA's food types and Conditions of Use are defined in Tables 1 and 2 at .

2. *Advancing Sustainable Materials Management: 2018 Fact Sheet. Assessing Trends in Materials Generation and Management in the United States,* U.S. Environmental Protection Agency, Office of Resource Conservation and Recovery, December 2020, *available at*: https://www.epa.gov/sites/production/files/2020-11/documents/2018_ff_fact_sheet.pdf.

## 15. Attachment

Confidential Attachment – Attachment 28