EARTHJUSTICE
BECAUSE THE EARTH NEEDS A GOOD LAWYER

NORTHEAST REGIONAL OFFICE
48 WALL STREET, 15TH FLOOR
NEW YORK, NY 10005-2903
T: 212.845.7376
F: 212.918.1556

November 1, 2024

Via electronic mail
United States Department of Agriculture
sm.rd.saratogacomments@usda.gov

Re: Comments on Saratoga Biochar Environmental Assessment

To whom it may concern:

Earthjustice, on behalf of Clean Air Action Network of Glens Falls ("CAAN") respectfully submits this second set of Comments on the Updated Environmental Assessment of Saratoga Biochar Solutions LLC ("SBS").

Introduction

SBS has filed an application for funding from the United States Department of Agriculture's Rural Business-Cooperative Service ("RBS") for a proposed facility in an industrial park in the Town of Moreau. RBS is required to comply with elements of the National Environmental Policy Act ("NEPA") prior to acting on this application. On June 19, 2024, pursuant to the NEPA process RBS solicited comments on an Environmental Assessment ("EA") prepared by SBS. Earthjustice submitted its first set of comments to RBS regarding the environmental impacts of the proposed SBS facility on behalf of CAAN on June 28, 2024. In response to this first set of comments and comments received by other parties, SBS submitted an Updated Environmental Assessment ("UEA") to RBS, and the agency opened a second comment period on the UEA beginning on October 3, 2024.

The UEA did not respond substantively to the issues raised in CAAN's first set of comments including, but not limited to: CAAN's concerns about CLCPA Section 7(3) compliance; CAAN's concerns about the double-counting of projected greenhouse gas ("GHG") emissions reductions; CAAN's concerns about the lack of a system to pretreat any PFAS that may end up in the facility's wastewater from truck wash, cooling water, or air treatment systems; and CAAN's concerns about the absence of a substantive alternatives analysis by SBS. CAAN also remains concerned about the ability of the facility to detect and destroy PFAS and PFAS products of incomplete combustion at scale.[1] Accordingly, CAAN preserves and reiterates all objections and arguments raised in its first set of comments here.

The following three sections of this second set of comments supplement the first set of CAAN's comments with additional rebuttals and elaboration. On the basis of these issues as well as those raised in CAAN's first set of comments, RBS must conclude that the SBS facility is likely to have significant adverse impacts and requires an Environmental Impact Statement.

[1] CAAN notes that the science of PFAS detection and destruction continues to develop, and that at present detection methods exist for only a tiny fraction of nearly 15,000 PFAS compounds.

I. SBS Has Not Demonstrated That its Proposed Pyrolysis Facility Would Be Compliant with CLCPA Section 7(3).

The proposed SBS facility will have a significant adverse impact because it fails to comply with environmental protections in state law. CLCPA Section 7(3) states that the New York State Department of Environmental Conservation ("DEC") can only approve permits for the SBS facility, if the facility does not disproportionately burden New York State-designated disadvantaged communities. CAAN's first set of comments offered a lengthy statutory analysis of the proposed pyrolysis facility's noncompliance with CLCPA Section 7(3), which SBS has almost entirely ignored in its UEA. SBS's implausible reading of Section 7(3) is short on legal citations and evinces a fundamental misunderstanding of agency guidance regarding CLCPA implementation as well as the CLCPA's legislative purpose, history, and text.

The degree to which SBS misunderstands CLCPA Section 7(3) was laid bare in DEC's last publicly available statement on the topic. In a request for additional information sent to SBS in June, DEC indicated that SBS had failed to provide information to the agency necessary for CLCPA Section 7(3) compliance:

> Your air permit application does not identify quantifiable mitigation efforts and instead includes a discussion of carbon sequestration and avoided GHG emissions that *DEC would not accept as a mitigation measure*. Please prepare and submit a more detailed suite of quantifiable, feasible mitigation options for review under CLCPA Section 7(3).[2]

SBS's response to DEC's question can be found in UEA Appendix P5. In said response, the Company stubbornly rebuffed DEC's request to propose quantifiable mitigation measures to offset the air pollutant emissions impacts of the SBS facility on surrounding disadvantaged communities as required by CLCPA Section 7(3).

Commenters maintain that an approval for the pyrolysis facility would violate CLCPA Section 7(3) unless SBS moves the site of the project away from New York State-designated disadvantaged communities in Hudson Falls and Glens Falls or finds some way to wholly offset the pollution burdens it will create in those two communities.

II. SBS Has Refused to Conduct a Legally Required Analysis of All Reasonable Alternatives.

CAAN's first set of comments noted that SBS had failed to explore reasonable alternatives to the project, including but not limited to an alternative whereby the throughput of the facility is less than 75,000 tons of biosolids annually; an alternative whereby the facility's size is reduced such that SBS facility pyrolyzes *only* the 8,000 tons of biosolids a year that are already sent from the Glens Falls WWTP to the Hudson Falls incinerator; an alternative whereby the thermal oxidizer temperature is increased;[3] an alternative whereby a single central processing

[2] Saratoga Biochar UEA Appendix P4, June 6, 2024 NYSDEC Request for Additional Information at 2 (emphasis added).

[3] A higher thermal oxidizer temperature may be more likely to destroy PFAS. As one DEC email to SBS notes "[t]he current research level literature on PFAS destruction has values of 2300 *to 2500 F* for complete destruction." CAAN Comment 2 Attachment D (emphasis added).

facility is replaced by smaller facilities across New York; and an alternative whereby biochar produced at the facility is used for purposes other than in agriculture.

The UEA provides a brief discussion of SBS's decision to site this pyrolysis near two New York State-designated disadvantaged communities, stating that "alternative locations … were not advanced for reasons including local zoning limitations and development moratoriums."[4] But this statement is belied by public statements made by SBS's CEO as late as this July stating that the company is in talks with "a couple of other" municipalities that may be interested in siting a pyrolysis facility locally and that said talks were "moving pretty far along fairly quickly."[5] Commenters maintain that it is both reasonable and necessary to require this pyrolysis facility to be sited away from a New York State-designated disadvantaged community.

SBS did not bother to consider the other reasonable alternatives to the project outlined in CAAN's first set of comments on the grounds that according to 7 CFR § 1970.13(a) "applicants of single-site actions are only required to consider the 'No Action' alternative in the EA."[6] SBS misunderstands or misreads 7 CFR § 1970.13(a), in particular, 7 CFR § 1970 more generally.

7 CFR § 1970.13(a) creates no exceptions for "single-site actions." The regulatory provision never uses that term. Rather, 7 CFR § 1970.13 states that "[t]he purpose of considering alternatives to a proposed action" in an EA "is to explore and evaluate whether there may be reasonable alternatives to that action that may have fewer or less significant negative environmental impacts." 7 CFR § 1970.13(a) states that in addition to evaluating the "No Action" alternative, an applicant "*must evaluate other reasonable alternatives* whenever the proposal involves potential adverse effects to environmental resources" (emphasis added). The "other reasonable alternatives" proposed for evaluation in CAAN's first set of comments have the potential to diminish the SBS facility's adverse effects on environmental resources. SBS is obligated to evaluate them.

The broader text of 7 CFR § 1970 buttresses this point. For example, 7 CFR § 1970.5(b)(3)(iii) states that "[a]s necessary, applicants must develop and document *reasonable alternatives* that meet their purpose and need while improving environmental outcomes" (emphasis added). Similarly, 7 CFR § 1970.102(a)(2) states that "[a]t a minimum, the EA must discuss … [t]he affected environment, including baseline conditions that may be impacted by the proposed action and alternatives." The use of the plural "alternatives" in this provision rather than a term like "at least one alternative" indicates that the drafters of 7 CFR § 1970 envisioned that applicants completing EAs would need to explore multiple alternatives to their proposed projects, not simply a single "No Action" alternative.

General NEPA case law also supports the view that all reasonable alternatives to a project must be considered at the EA stage:

---

[4] Saratoga Biochar UEA at 2.
[5] Tylar A. McNeil, *Northeastern Biochar: Fulton County Site 'Not Panning Out,'* The Daily Gazette (June 2, 2024), https://www.dailygazette.com/leader_herald/news/northeastern-biochar-fulton/article_ca7a94a8-37cd-11ef-9a94-47174a341909.html.
[6] Saratoga Biochar Comment Matrix at 4.

NEPA's requirement that agencies study, develop, and describe appropriate alternatives ... applies whether an agency is preparing an [EIS] or an [EA]… an agency must still give full and meaningful consideration to all reasonable alternatives in an environmental assessment… The existence of a viable but unexamined alternative renders an [EA] inadequate.[7]

III. CAAN Remains Concerned That SBS's Biosolids-Derived Biochar Is Not Suitable for Agricultural Land Application, and a Global Review of Biochar Regulations and Standards Supports CAAN's Concerns.

CAAN's first set of comments raised concerns that SBS's biosolids (colloquially, "sewage sludge") derived biochar may result in significant adverse impacts to the environment if applied to agricultural land due to the wide range of contaminants that may be present in this biochar. Here, CAAN reiterates this concern and draws RBS's attention to just two classes of contaminants that are likely to be present in SBS's biochar: 1) heavy metals and 2) potentially carcinogenic polyaromatic hydrocarbons ("PAHs").

Commenters are deeply concerned that SBS has stubbornly refused to provide any data whatsoever on the PAHs that might be present in the Company's biochar.[8] Concerns about contamination resulting from PAHs in sewage-sludge derived biochar are science-based.[9] As mentioned in CAAN's first set of comments, PAHs can be produced by the pyrolysis process itself. Some environmental advocates, like Friends of the Earth Germany and European Environmental Citizens Organisation for Standardisation, have taken the position that existing tests to detect PAHs may underestimate the level of PAHs present in biochar.[10] On the other hand, advocates for the production and use of biochar contend that accurate test methods exist, that it is possible to deduce limit values for PAHs in agricultural biochar, and that PAH levels in biochar can be reduced below these limit values if biochar is produced with the right controls.[11] What is clear is that there is a widely shared view among environmental advocates, regulators, and knowledgeable standard-setting organizations that data on PAHs is necessary to determine whether biochar is suitable for land application.

Commenters are also deeply concerned that the heavy metal contents of SBS's biochar are too high for agricultural land application. SBS has supplied estimates of some of the heavy metals it expects to be present in its biosolids derived biochar:

---

[7] *See W. Watersheds Project v. Abbey*, 719 F.3d 1035, 1050 (9th Cir. 2013) (internal quotation marks omitted) (citations omitted).
[8] Saratoga Biochar UEA Appendix P5, August 6, 2024 Letter to NYSDEC at 9–10.
[9] Xiaoyang Chen et al., *Leaching of Polycyclic Aromatic Hydrocarbons (PAHs) from Sewage Sludge Derived Biochar*, 373 Chem. Eng'g J. 840 (2019) ("CAAN Comment 2 Attachment A").
[10] *See* European Commission, Feedback from: Friends of the Earth Germany (BUND) (Feb. 14, 2021), https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12136-Fertilising-products-pyrolysis-and-gasification-materials/F1798083_en; European Commission, Feedback from: European Environmental Citizens Organisation for Standardisation (ECOS) (Feb. 15, 2021), https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12136-Fertilising-products-pyrolysis-and-gasification-materials/F1854208_en.
[11] CAAN's second set of comments does not take a position on this debate, but merely highlights it to showcase the widespread concerns about PAHs among both critics and advocates of the widespread use of biochar in agriculture.

Figure 1

Metal	Saratoga Biochar "anticipated… heavy metal content" based on 950°F Illinois Biosolids-Derived Test Batch Biochar (mg/kg)
Arsenic	22
Cadmium	1.2
Chromium	25
Copper	690
Lead	38
Mercury	<1
Molybdenum	15
Nickel	39
Selenium	<1
Zinc	1,300

Source: Saratoga Biochar UEA Appendix P5, August 6, 2024 Letter to NYSDEC at 8–9

The data in this estimate raises several alarms. First, the Test Biochar used to generate the data above was produced from biosolids sourced from Illinois, not New York. There is no guarantee that the heavy metals levels in this feedstock will be equivalent to the levels found in the New York biosolids that would serve the SBS facility.

Second, SBS notes that the "SBS Facility will achieve a material temperature up to 1,150° F, which may result in higher metal concentrations" than those in the 950°F Test Biochar[12] — presumably because cooking biosolids at higher temperatures concentrates more metals in the final biochar product. SBS contends that it can nonetheless control the level of heavy metals in the final product by averaging incoming biosolids batches and by diluting the feedstock with wood waste.[13] But these are totally different production conditions than those used to produce the Test Biochar. Commenters doubt whether biochar produced under totally different conditions can serve as an accurate proxy for biochar that would be produced at the SBS facility.

Third, SBS's Test Biochar data is worrisome even if it accurately anticipates the actual heavy metal content of Saratoga Biochar's product. The heavy metals levels in SBS's Test Biochar exceed the maximum contaminant levels for safe agricultural use established by the biochar industry's leading standard setting organizations.

The remaining subsections of CAAN's second set of comments demonstrate that SBS's Test Biochar likely would not qualify for certification for agricultural use from a number of credible regulatory bodies and standard-setting organizations around the globe. In the absence of applicable regulatory limits or standards in the United States, the failure to meet agricultural use

[12] Saratoga Biochar UEA Appendix P5, August 6, 2024 Letter to NYSDEC at 9.
[13] *Id*. at 7–9.

qualifications of multiple international standard-setting organizations demonstrates that use of SBS's product as an agricultural amendment is likely to have a significant adverse impact on the environment.

A. Saratoga Biochar's Test Biochar is not Compliant with the EU Fertilising Product Regulation.

As stated in CAAN's first set of comments, in 2021, the European Commission, a legislative-regulatory body of the European Union, promulgated a regulation stating that it would certify the sale of biochar as a fertilizer if the biochar complied with certain standards. SBS's biochar does not meet the European Commission's "EU Fertilising Product" standard for at least two reasons. First, sewage sludge-derived biochar is excluded from the standard because in the regulatory agency's judgment "it is, for the moment, unclear whether contaminants of emerging concern, such as pharmaceuticals… are completely eliminated [from sewage sludge-derived biochar] following the processing methods for pyrolysis."[14] Second, SBS has failed to produce any data on PAHs that are likely to be found in its biochar. The Commission sets strict PAH limits on biochar:[15]

> 3. The pyrolysis and gasification materials shall have a molar ratio of hydrogen (H) to organic carbon (H / C_{org}) of less than 0,7, with testing to be performed in the dry and ash-free fraction for materials that have an organic carbon (C_{org}) content of less than 50 %. They shall have no more than:
>
> (a) 6 mg/kg dry matter of PAH_{16} (**),
>
> (b) 20 ng WHO toxicity equivalents (***) of PCDD/F(****) /kg dry matter,
>
> (c) 0,8 mg/kg dry matter of ndl-PCB(*****),

B. Saratoga Biochar's Test Biochar is not compliant with the Swiss Federal Office for Agriculture's biochar standard.

The Swiss Federal Office for Agriculture also maintains a biochar standard.[16] SBS's biochar is not compliant with this standard. Sewage-sludge biochar is prohibited by the Swiss standard, and the standard sets strict limits on PAH's that can be present found in biochar.[17]

---

[14] *See* Explanatory Memorandum for Commission Delegated Regulation 2021/2088 at 2 (Appendix 4, Exhibit 2).
[15] 2021 EU Fertilising Product Regulation (CAAN Comment 2 Attachment B).
[16] Swiss Federal Office for Agriculture's Biochar Standard (CAAN Comment 2 Attachment C).
[17] The Swiss Standard is presently even more restrictive than the European Commission's standard, as it only allows for the land application of biochar made from "natural wood." However, the list of acceptable feedstocks is likely to be expanded this year to align with the limited list of acceptable feedstocks in the European Commission's 2021 Fertilising Products Regulation. *See* BAFU, *Pflanzenkohle in der Schweizer Landwirtschaft Risiken und Chancen für Boden und Klima* at 6 (2023), https://www.bafu.admin.ch/dam/bafu/de/dokumente/klima/fachinfo-daten/faktenblatt-pflanzenkohle-2022.pdf.download.pdf/D_Faktenblatt_Pflanzenkohle.pdf.

C. Saratoga Biochar's Test Biochar is not compliant with the Ithaka Institute's EBC standard for use of biochar in agriculture.

The EBC is a biochar standard that has served as a model for several national regulatory bodies that have adopted biochar-specific regulations.[18] The standard was developed by the Ithaka Institute, a global non-profit research foundation specializing in biochar "to provide customers with a reliable quality standard, while giving producers the opportunity to prove that their products meet well-defined and recognized quality standards."[19] The standard is updated periodically "to provide a firm state-of-the-art knowledge transfer" to stakeholders interested in the use and regulation of biochar.[20] The standard was last updated in 2023.[21]

Recognizing that biochar can be used for purposes other than agriculture, the EBC standard divides biochar into seven classes: EBC-FeedPlus & EBC-Feed, EBC-AgroOrganic, EBC-Agro, EBC-Urban, EBC-ConsumerMaterials, and EBC-BasicMaterials.

Whereas, EBC-Agro biochar can be used for agricultural and home gardening purposes, EBC-BasicMaterials "can be used in basic industry such as to produce building materials, road construction asphalt, electronics, sewage drains, and composite materials like skis, boats, cars, rockets without risk to the environment and users."[22] The Ithaka Institute stresses "EBC-BasicMaterials [biochar] must not be used in agriculture or other soil applications such as planting urban trees, remediating polluted areas, or mine reclamation."[23]

According to the Ithaka Institute "Sludges from wastewater treatment," including biosolids, only qualify for the EBC-BasicMaterials certification.[24] Biosolids-derived biochar is categorically barred from an EBC-Agro certification.[25] And even if biosolids-derived biochar was eligible for EBC-Agro certification, SBS's Test Biochar would not be. The EBC-Agro standard sets the following heavy metals limits for EBC-Agro biochar:

---

[18] *See* European Biochar Certificate (EBC), https://www.european-biochar.org/en/home (last visited Oct. 30, 2024).
[19] *See id*. Day to day operation of the certification is managed by another organization, Carbon Standards International. *See* Costs of Certification, https://www.european-biochar.org/en/ct/154-Costs-of-certification (last updated Oct. 25, 2021).
[20] *See* European Biochar Certificate (EBC), https://www.european-biochar.org/en/home (last visited Oct. 30, 2024).
[21] Updates, https://www.european-biochar.org/en/ct/7-Updates (last visited Oct. 30, 2024).
[22] EBC Guidelines for a Sustainable Production of Biochar Version 10.3 at 11–13 (Apr. 5, 2023), https://www.european-biochar.org/media/doc/2/version_en_10_3.pdf.
[23] *Id.* at 13.
[24] *See* Positive List of Permissible Biomasses for the Production of Biochar at 4, https://www.european-biochar.org/media/doc/2/positivlist_en_v10_3_v4.pdf (last updated June 20, 2024).
[25] *Id*.

Tab. 2: Limit values for heavy metals according to the EBC application classes.

	EBC-FeedPlus / EBC-Feed	EBC-AgroBio	EBC-Agro / EBC-Urban / EBC-ConsumerMaterials	EBC-BasicMaterials
Pb	10 g t^{-1} (88%DM)	45 g t^{-1} DM	120 g t^{-1} DM	no limit value, only declaration required
Cd	0.8 g t^{-1} (88% DM)	0.7 g t^{-1} DM	1,5 g t^{-1} DM	
Cu	70 g t^{-1}DM	70 g t^{-1}DM	100 g t^{-1} DM	
Ni	25 g t^{-1} DM	25 g t^{-1} DM	50 g t^{-1} DM	
Hg	0.1 g t^{-1} (88% DM)	0.4 g t^{-1} DM	1 g t^{-1} DM	
Zn	200 g t^{-1} DM	200 g t^{-1} DM	400 g t^{-1} DM	
Cr	70 g t^{-1} DM	70 g t^{-1} DM	90 g t^{-1} DM	
As	2 g t^{-1} (88% DM)	13 g t^{-1} DM	13 g t^{-1} DM	
Ag	no limit value, only declaration required			

Source: EBC Guidelines for a Sustainable Production of Biochar Version 10.3 at 23

If one cross-references these limits with the heavy metal concentrations in Figure 1 above, one finds that Saratoga Biochar's Test Biochar is non-compliant with the EBC-Agro standards for arsenic, copper, and zinc.

The EBC-Agro standard also sets strict limits on the PAHs that may be present in biochar used in agriculture:

7.12 Limit values for PAH contents must not be exceeded

EBC -Certification Class	Certification Class	EBC-FeedPlus	EBC-Feed	EBC-Agro / EBC-AgroOrganic	EBC-Urban	EBC-ConsumerMaterials*	EBC-BasicMaterials
Organic contaminents	16 EPA PAH	6.0+2.4 g t^{-1} DM	CSI-declaration	6.0+2.4 g t^{-1} DM	CSI-declaration	CSI-declaration	CSI-declaration
	8 EFSA PAH	1.0 g t^{-1} DM					4 g t^{-1} DM
	benzo[e]pyrene benzo[j]fluoran-thene	< 1.0 g t^{-1} DM for each of both substances					

* medical and health care products are not included

Source: EBC Guidelines for a Sustainable Production of Biochar Version 10.3 at 26.

D. Saratoga Biochar's Test Biochar is not compliant with the Carbon Standards International WBC standard for use of biochar in agriculture.

An alternative, more lax biochar standard than the EBC is Carbon Standards International's WBC.[26] Like the EBC, the WBC divides biochars into categories: "WBC-Agro" and "WBC-Material." Whereas "WBC-Agro defines the requirements for safe biochar application in agriculture… WBC-Material… can be used in basic industries such as to produce building materials, road construction asphalt, electronics, sewage drains, and composite materials like skis, boats, cars, and rockets."[27]

Unlike the EBC, the WBC standard states that "[b]iosolids may be used as feedstock to produce WBC-Agro… provided that health risks for workers during the handling of the biosolids are prevented."[28] However, the WBC standard adds "[u]nfortunately, the heavy metal contents of most biosolids are too high for WBC-Agro and, thus, for soil application."[29]

Table 2: Limit values for heavy metals according to the WBC certification classes.

		WBC-Premium	WBC-Agro	WBC-Material
Heavy metals	Pb	120 g t^{-1} DM	300 g t^{-1} DM	no limit value, only declaration required
Potential toxic	Cd	1,5 g t^{-1} DM	5 g t^{-1} DM	
elements (PTE)	Cu	140 g t^{-1} DM	200 g t^{-1} DM (*)	
	Ni	50 g t^{-1} DM	100 g t^{-1} DM	
	Hg	1 g t^{-1} DM	2 g t^{-1} DM	
	Zn	420 g t^{-1} DM	1000 g t^{-1} DM (*)	
	Cr	100 g t^{-1} DM	200 g t^{-1} DM	
	As	13 g t^{-1} DM	20 g t^{-1} DM	
	Ag, Se	no limit value, only declaration required	no limit value, only declaration required	

(*) = guide value

Source: WBC Guidelines for a Sustainable Production of Biochar Version 1.0 at 23.

Indeed, SBS's Test Biochar bears out this observation. As Figure 1 above illustrates, the SBS Test Biochar levels for arsenic exceed the limit values allowed by the WBC-Agro standard. The limit values for Copper and Zinc are also exceeded (except for soils deficient in Copper and Zinc).[30]

---

[26] This standard is likely to become increasingly important to biochar proponents as, in May of this year, another leading organization dedicated to the promotion of biochar, the International Biochar Initiative, announced that it was retiring its own certification program and collaborating on updating the WBC moving forward. International Biochar Initiative, *Driving Confidence in Biochar: IBI and CSI Merge Standards for Industry Growth* (May 20, 2024), https://biochar-international.org/news/driving-confidence-in-biochar-ibi-and-csi-merge-standards-for-industry-growth/.

[27] *See* WBC Guidelines for a Sustainable Production of Biochar Version 1.0 at 12–13 (Sept. 15, 2023), https://www.european-biochar.org/media/doc/2/wbc_1_0b.pdf.

[28] *Id.* at 15.

[29] *Id.* at 16.

[30] *Id.* at 24.

The WBC Standard also includes stringent limits for PAHs in biochar used for agricultural purposes, which SBS has not demonstrated compliance with:

Tab. 3: PAH limit values for the WBC certification classes.

WBC -Certification Class		WBC-Premium	WBC-Agro	WBC-Material
Organic contaminents	8 EFSA PAH	1.0 g t^{-1} DM	1.0 g t^{-1} DM	4 g t^{-1} DM
	16 EPA PAH	6.0 g t^{-1} DM	declaration	declaration

Source: WBC Guidelines for a Sustainable Production of Biochar Version 1.0 at 26.

E. Saratoga Biochar's Test Biochar is not compliant with the Australia New Zealand Biochar Industry Group's standard for most uses of biochar in agriculture.

The Australia New Zealand Biochar Industry Group ("ANZBIG") is a "cluster industry group" that aims to "to streamline Biochar education, research, collaboration, and commercialisation activities" and "facilitate the safe and effective use of Biochar" in Australia and New Zealand.[31] The group developed a "Code of Practice for the Sustainable Production and Use of Biochar in Australia and New Zealand" that "sets out industry best practice for the sustainable production and use of biochar."[32]

Much like the EBC and WBC standards, the ANZBIG Code of Practice categorizes biochar into distinct classes based on the quality of and best uses for the product. Biochar in the "Standard" class is "[g]enerally suitable for most agricultural use excluding animal feed," and "[g]enerally, can be safely used for other applications."[33] By contrast, biochar in the "Industrial A" class is "[s]uitable for some industrial uses" and "[g]enerally, not suitable for agriculture accept when applied in low concentrations and / or application rates."[34] The lowest quality biochar in the "Industrial B" class is only "[s]uitable for specified industrial uses where impurities do not present as an environmental or health hazard."[35] The contaminant limits for the ANZBIG Code of Practice can be found below:

[31] *See* ANZBIG, Mission, https://anzbig.org/about/ (last visited Oct. 30, 2024).
[32] *See* ANZBIG, Code of Practice for the Sustainable Production and Use of Biochar in Australia and New Zealand at 4 (Nov. 22, 2021), https://anzbig.org/wp-content/uploads/2021/11/ANZBIG-Biochar-Code-of-Practice_22Nov2021_Version1.0-1.pdf.
[33] *Id.* at 10.
[34] *Id*.
[35] *Id*.

Impurity	Units	Biochar Grade			
		Feed	Standard	Industrial A	Industrial B
Lead	mg/kg	<0.2	<20	<300	Use specific
Cadmium	mg/kg	<0.5	<1	<20	Use specific
Mercury	mg/kg	<0.02	<0.2	<10	Use specific
Arsenic	mg/kg	<2	<13	<100	Use specific
Copper	mg/kg	<70	<200	<6000	Use specific
Nickel	mg/kg	<25	<60	<400	Use specific
Selenium	mg/kg	<1	<3	<200	Use specific
Zinc	mg/kg	<200	<600	<7400	Use specific
Chromium	mg/kg	<70 (<1 for CrVI)	<90 (<1 for CrVI)	<100	Use specific
Polycyclic aromatic hydrocarbons (PAHs)	mg/kg	<4	<5	<300	Use specific
Benzo(a) Pyrene	ng/kg	<25	NS	NS	NS
Dioxin/furans	ng/kg	See below	<17	<17	Use specific
Fluorine (soluble salts as fluoride)	mg/kg	<40	NS	NS	NS
PCBs	mg/kg	See below	<0.2	<1	Use specific

Notes

DM = Dry Matter, commonly at 88% DM (12% moisture).

Australian soils are commonly deficient in certain trace metals (eg Zinc and Copper) and some crops require replacement balance (eg wheat). This should be considered by biochar users on a case-by-case basis.

Note that Cu in animal feeds in WA must be <15 mg/kg.

Declaration values should also be made for chlorine in all chars, and for Bo, Mn, Nitrite and Melamine in Feed chars.

For biochars derived from municipal biosolids, a range of additional tests should be undertaken in consultation with regulators (eg organochlorines/POPs, PFAS, Pthalates, and otehr emerging contaminants). For biochars sourced from feedstocks treated with pesticides and herbicides, additional tests should be considered.

All standard and feed grade chars should pass a germination inhibition test.

Comparing this table with Figure 1 above, it is clear that Saratoga Biochar's Test Biochar contains heavy metals in excess of the maximums allowed by the ANZBIG Code of Practice for Standard-grade biochar. Specifically, Saratoga Biochar's Test Biochar exceeds the limits for Lead, Cadmium, and Arsenic, Copper and Zinc. It is also notable that, like every other biochar standard listed above, the ANZBIG Code of Practice sets PAH limits on biochar.

F. Saratoga Biochar's Test Biochar is not compliant with the Singapore Standards Council's standard for use of biochar in agriculture.

The Singapore Standards Council is an industry-led national standards body, which is overseen by Singapore's government.[36] The Singapore Standards Council has issued a "Code of practice for the production and application of biochar" setting limits on contaminant levels in biochar.[37] Like the other biochar standards listed above the Singapore Standard Council's guidelines set strict limits on the concentrations of PAHs that are allowed to be present in biochar used in agriculture (<4 mg/kg).[38] The standard also sets forth stringent allowable limits for heavy metals in agricultural biochar that are greatly exceeded by SBS's Test Biochar—including for Zinc (< 200 mg/kg); Nickel (< 20 mg/kg); Lead (< 10 mg/kg); and Arsenic (< 2 mg/kg).[39]

G. Saratoga Biochar's Biosolids-Derived Biochar likely does not comply with the Natural Resource Conservation Service's ("NRCS") Conservation Practice Standard for Soil Carbon Amendments.

NRCS Conservation Practice Standard Code 336 for Soil Carbon Amendments states that the land application of some biochar qualifies as an agricultural conservation practice.[40] In contrast to the standards described above, this Conservation Practice Standard sets very lax heavy metals limits.[41] Nevertheless, SBS's biosolids-derived biochar would likely not qualify as a conservation practice standard under Code 336 for at least one of two reasons.

First, the standard applies only to biochar "derived from plant materials or treated animal byproducts."[42] Biosolids contain a mix of wastes, not just plant and animal, but also household, medical, chemical, and industrial waste—so it is not clear that land application of biosolids-derived biochar is an eligible conservation practice under Code 336.[43] Second, even if biosolids-derived biochar can in some circumstances qualify as a conservation practice, Code 336 indicates that biochar with a "higher risk of synthetic organic or heavy metal contaminants" must be

---

[36] *See* International Trade Administration, Singapore Country Commercial Guide (Jan. 5, 2024), https://www.trade.gov/country-commercial-guides/singapore-standards-trade; Enterprise Singapore, About the SSC, https://www.enterprisesg.gov.sg/Grow-Your-Business/boost-capabilities/quality-and-standards/singapore-standards-council (last updated Sept. 1, 2024).

[37] Singapore Standards, SS 698:2023 Code of Practice for the Production and Application of Biochar, https://www.singaporestandardseshop.sg/Product/SSPdtDetail/c39c65f7-15fa-42a8-a924-5079bdf25056 (last visited Oct. 30, 2024).

[38] *Id.* at 9.

[39] *Id*.

[40] *See* USDA, NRCS Conservation Practice Standard Code 336 for Soil Carbon Amendments at 4 (Nov. 2022), https://www.nrcs.usda.gov/sites/default/files/2022-11/336-NHCP-CPS-Soil-Carbon-Amendment-2022.pdf.

[41] *Id.* at 3.

[42] *Id.* at 1.

[43] *See* Tom Perkins, *Biosolids: Mix Human Waste with Toxic Chemicals, Then Spread on Crops*, The Guardian (Oct. 5, 2019), https://www.theguardian.com/environment/2019/oct/05/biosolids-toxic-chemicals-pollution; Center for Food Safety, *What is Sewage Sludge?*, https://www.centerforfoodsafety.org/issues/1050/sewage-sludge/what-is-sewage-sludge (last visited Oct. 30, 2024).

evaluated for PAHs "as appropriate."[44] As mentioned repeatedly above, SBS has stubbornly refused to conduct such an evaluation.

H. 40 CFR § 503 does not apply to biochar and is not an adequate standard for regulating biochar.

SBS suggests that any public health concerns presented by the agricultural use of its biochar will be addressed by the company's compliance with EPA's 40 CFR § 503.13 limits.[45] This argument is fundamentally flawed. [46] 40 CFR § 503.13 applies only "to *sewage sludge* applied to the land."[47] Plainly, biochar is not included in the regulation's definition of "sewage sludge."[48] In fact, an EPA Office of Water report dated June 2019 states clearly that "Biochar... are residuals from burning biosolids, which are... excluded by 40 CFR Part 503."[49] EPA's regulatory judgment is sound, in part, because biochar products are chemically distinct from biosolids.[50] For example, as noted repeatedly, the pyrolysis process can produce carcinogenic PAHs in biochar that may present risks to human health and the environment. Since Part 503 was not designed to regulate biochar, it does not set limits on PAHs or prescribe a method for testing for these pollutants. The Part 503 standard is therefore not sufficient to guard against the distinctive contamination risks presented by biosolids-derived biochar.

---

[44] *See* USDA, NRCS Conservation Practice Standard Code 336 for Soil Carbon Amendments at 3 (Nov. 2022), https://www.nrcs.usda.gov/sites/default/files/2022-11/336-NHCP-CPS-Soil-Carbon-Amendment-2022.pdf.It may be worth noting here that Code 336 includes the EBC and International Biochar Initiative guidelines among its list of references. *See id.* at 7. This would suggest that "as appropriate" should be interpreted in light of these guideposts.
[45] *See* Saratoga Biochar UEA Appendix P5, August 6, 2024 Letter to NYSDEC at 7, 9–10.
[46] Even with regard to biosolids, as noted in CAAN's March 18, 2024 comments to DEC, 40 CFR Part 503 rules are "deeply flawed and outdated" for assessing the safety of land-applied sewage sludge/biosolids. *See* CAAN March 18, 2024 Comments, Trabbic-Pointer Declaration ¶¶ 9, 28, https://earthjustice.org/wp-content/uploads/2024/03/2024.03.18-ej-comments-appendices.pdf.
[47] *See* 40 CFR § 503.10(a).
[48] *See id.* at § 503.9(w).
[49] *See* Biosolids Biennial Review Reporting Period 2016–2017 at 5 (June 2019), https://www.epa.gov/sites/default/files/2019-06/documents/2016-2017-biosolids-biennial-review.pdf; *see also* USDA California Climate Hub, Climate-Smart Agriculture Fact Sheet Series: On Biochar Amendments at 2, https://www.climatehubs.usda.gov/sites/default/files/%20WLIC%20Fact%20Sheet%204_Biochar.pdf (noting that "there are no current regulatory standards for biochar contaminant levels") (last visited Oct. 30, 2024).
[50] *See* CAAN March 18, 2024 Comments at 25, https://earthjustice.org/wp-content/uploads/2024/03/2024.03.18-ej-comments-appendices.pdf (noting that it is inappropriate to rely on frameworks designed to regulate biosolids when assessing the quality of land-applied biochar).

IV. Conclusion

For the reasons stated above and in CAAN's first set of comments, RBS must find that significant adverse impacts will result from the SBS project and must ensure that a more thorough and comprehensive NEPA analysis of the project is conducted.

Respectfully submitted,

Michael Youhana
Rachel Spector
Fabiana Castillo
Earthjustice
48 Wall Street, 15th Fl.
New York, NY 10005
rspector@earthjustice.org
myouhana@earthjustice.org
fcastillo@earthjustice.org