

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 10/2015)

CALIFORNIA ENERGY COMMISSION

New Agreement EPC-18-009 (To be completed by CGL Office)

ERDD	Rachel Salazar	51	916-445-5316
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Porifera, Inc.	26-2704998
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Energy Savings Through Osmotic Concentration for the Food and Beverage Processing Industry
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4/1/2019	01/30/2023	\$ 2,800,687
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☐ ARFVTP agreements under \$75K delegated to Executive Director.

Proposed Business Meeting Date	3/12/2019	<input type="checkbox"/> Consent	<input checked="" type="checkbox"/> Discussion
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Business Meeting Presenter	Rachel Salazar	Time Needed:	5 minutes
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Please select one list serve. EPIC (Electric Program Investment Charge)

Agenda Item Subject and Description

1. Is Agreement considered a "Project" under CEQA?

☒ Yes (skip to question 2)☐ No (complete the following (PRC 21065 and 14 CCR 15378)):

Explain why Agreement is not considered a "Project":

2. If Agreement is considered a "Project" under CEQA:

☒ a) Agreement **IS** exempt. (Attach draft NOE)☐ Statutory Exemption. List PRC and/or CCR section number: _____☒ Categorical Exemption. List CCR section number: Cal. Code Regs., tit. 14, § 15303☐ Common Sense Exemption. 14 CCR 15061 (b) (3)

Explain reason why Agreement is exempt under the above section:

This project involves laboratory research, equipment design and assembly, and equipment operation. All proposed activities will take place within existing, fully permitted buildings or facilities, without need for expansion or significant modification of the facilities. The new forward osmosis system will be installed and operated at a warehouse designated for fruit juice production and concentration. The system will be skid-mounted and will use existing infrastructure (plumbing, electrical, water, and sewer). The system has an approximate footprint of 10 feet by 15 feet, and will not impact operations at the facility. Furthermore, the electrical consumption of the system will be less than one percent of the facility's current electrical consumption. Finally, none of the proposed activities will cause a direct or reasonably foreseeable indirect physical change in the environment. California Code of Regulations, title 14, section 15303 exempts construction and location of limited numbers of new, small facilities or structures, along with water main, sewage, electrical, gas, and other utility extensions of reasonable length to serve such construction. The proposed project's activities will have no significant effect on the environment and fall within the categorical exemption of section 15303.

☐ b) Agreement **IS NOT** exempt. (Consult with the legal office to determine next steps.)

Check all that apply

☐ Initial Study☐ Negative Declaration☐ Mitigated Negative Declaration☐ Environmental Impact Report☐ Statement of Overriding Considerations

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CALIFORNIA ENERGY COMMISSION



Legal Company Name:		Budget
Agricultural Research Services, U. S. Department of Agriculture		\$ 19,500
To Be Determined		\$ 25,000
To Be Determined #2		\$ 30,000
CDM Smith Inc.		\$ 16,000
TBD - Contractor		\$ 20,000
James Coyle		\$ 30,000
		\$
		\$
		\$

Legal Company Name:	
Van Groningen & Sons, Inc.	

Funding Source	Funding Year of Appropriation	Budget List No.	Amount
EPIC	17/18	301.001E	\$2,800,687.00
			\$
			\$
			\$
			\$
			\$
R&D Program Area:	EERO: IAW		\$2,800,687
Explanation for "Other" selection			
Reimbursement Contract #:		Federal Agreement #:	

Name:	Jeffrey Mendelssohn	Name:	Olgica Bakajin
Address:	1575 Alvarado St	Address:	1575 Alvarado St
City, State, Zip:	San Leandro, CA 94577-2640	City, State, Zip:	San Leandro, CA 94577-2640
Phone:	510-999-5189 /	Fax:	- -
E-Mail:	Jeffrey.mendelssohn@poriferanano.com	E-Mail:	olgica@poriferanano.com

<input checked="" type="checkbox"/> Competitive Solicitation	Solicitation #: GFO-17-308
<input type="checkbox"/> First Come First Served Solicitation	

1. Exhibit A, Scope of Work	<input checked="" type="checkbox"/> Attached
2. Exhibit B, Budget Detail	<input checked="" type="checkbox"/> Attached
3. CEC 105, Questionnaire for Identifying Conflicts	<input checked="" type="checkbox"/> Attached
4. Recipient Resolution	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Attached
5. CEQA Documentation	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Attached

Agreement Manager

Date

Office Manager

Date

Deputy Director

Date

Exhibit A

Scope of Work

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR¹	Task Name
1		General Project Tasks
2		Pre-Installation Preparations and System Development
3		Season 1 Operation and Analysis
4	X	Season 2&3 Operation, Optimization, and Product Analysis
5		Product Analysis for Additional Products
6		Measurement and Verification
7		Evaluation of Project Benefits
8		Technology/Knowledge Transfer Activities
9		Production Readiness Plan

B. Acronym/Term List

Acronym/Term	Meaning
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CIP	Clean-In-Place
CPR	Critical Project Review
FO	Forward Osmosis
PFO	Porifera Forward Osmosis
pH	Potential of Hydrogen. A measurement of acidity or alkalinity of water soluble substances
TAC	Technical Advisory Committee
USDA	United States Department of Agriculture

II. PURPOSE OF AGREEMENT, PROBLEM/SOLUTION STATEMENT, AND GOALS AND OBJECTIVES

A. Purpose of Agreement

The purpose of this Agreement is to fund the installation of a commercial-scale Porifera Forward Osmosis (PFO) Concentrator for California food and beverage processors that will be able to produce a sellable product and will demonstrate the benefits of Porifera's technology in producing non-thermal juice concentrates and freeze-dried powder products. The demonstration will take place over three years at a watermelon processing facility where three different demonstration attempts will be made during each year's watermelon processing seasons (typically July-October). Evaluation and continuous improvement efforts will be the focus in between the watermelon processing seasons. The PFO Concentrator will go through three phases of design, referred to as Mark I, Mark II, and Mark III, respectfully.

¹ Please see subtask 1.3 in Part III of the Scope of Work (General Project Tasks) for a description of Critical Project Review (CPR) Meetings.

Exhibit A

Scope of Work

B. Problem/ Solution Statement

Problem

While membrane systems have been used to concentrate dilute food and beverage products, most membrane systems have significant operation limitations in the food and beverage industry due to fouling of the membrane and operational pressure limits. These render most membrane systems unusable for most food and beverage processing, such as the concentration of fruits and vegetable juices, and dairy products. There is a need for energy-efficient methods to concentrate food and beverage products with high tolerance to processing conditions (temperature, pH, viscosity) that will not degrade product quality. Today's mainstream technologies, (i.e., thermal evaporators) degrade the product and are energy intensive.

Solution

Porifera's PFO Concentrator uses forward-osmosis (a non-thermal process) to more efficiently produce superior food and beverage concentrates. Porifera has made significant advances in the development and piloting of forward-osmosis systems. Compared to thermal evaporators, the PFO Concentrator saves energy, has lower costs, has a smaller system footprint, and does not degrade product taste, color, or nutritional content. Porifera will install a commercial PFO Concentrator at a grower and processor site to demonstrate the benefits and energy savings to food and beverage customers. Additionally, Porifera will collaborate with the United States Department of Agriculture (USDA) to demonstrate the PFO Concentrator's benefits and energy savings associated with making freeze-dried products.

C. Goals and Objectives of the Agreement

Agreement Goals

The goal of this Agreement is to:

- Demonstrate Porifera's PFO Concentrator at commercial-scale.

Ratepayer Benefits:² This agreement will result in significant savings for California's food and beverage processors. Food and Beverage processors are amongst the largest industrial consumers of energy in California. Replacement of energy-intensive thermal evaporators with the PFO Concentrator is estimated to provide an average of 40%-80% energy savings for each facility that utilizes this technology. Assuming 25% replacement of food and beverage evaporators, the estimated energy savings would be equivalent to a reduction of 781,000 metric tons of carbon dioxide emissions per year. In addition, reduced energy demand will improve reliability of the state's electrical grid and reduce costs associated with energy production and transmission. The PFO Concentrator will also contribute to improved development of more nutritious and better tasting food and beverage products, giving California processors a competitive advantage in the growing consumer market for healthy, natural products. Lastly, increased water reuse onsite will improve groundwater and surface water availability.

² California Public Resources Code, Section 25711.5(a) requires projects funded by the Electric Program Investment Charge (EPIC) to result in ratepayer benefits. The California Public Utilities Commission, which established the EPIC in 2011, defines ratepayer benefits as greater reliability, lower costs, and increased safety (See CPUC "Phase 2" Decision 12-05-037 at page 19, May 24, 2012, http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/167664.PDF).

Exhibit A Scope of Work

Technological Advancement and Breakthroughs:³ This Agreement will lead to technological advancement and breakthroughs that overcome barriers to the achievement of the State of California's statutory energy goals by demonstrating advantages of Porifera's breakthrough technology and accelerating its adoption. The PFO Concentrator can concentrate food and beverage products to very high concentrations that conventional membrane systems cannot achieve alone. In addition, PFO technology requires significantly less energy than evaporators, the only competing systems that can achieve the same sugar concentration targets, and does not degrade or alter the food and beverage product. The PFO Concentrator can create concentrates and freeze-dried powders of higher quality than competing technologies.

Agreement Objectives

The objectives of this Agreement are to:

- Demonstrate the benefits of the PFO Concentrator for food and beverage product concentration, such as: superior aroma, flavor and color, nutritional content, and energy savings.
- Advance the abilities of the PFO Concentrator system between multiple watermelon processing seasons of operation.
- Demonstrate market readiness of the PFO Concentrator by validating the concentration of other food and beverage products.
- Demonstrate the freeze-drying of Concentrator products.

III. TASK: 1 GENERAL PROJECT TASKS

PRODUCTS

Subtask 1.1 Products

The goal of this subtask is to establish the requirements for submitting project products (e.g., reports, summaries, plans, and presentation materials). Unless otherwise specified by the Commission Agreement Manager (CAM), the Recipient must deliver products as required below by the dates listed in the **Project Schedule (Part V)**. Products that require a draft version are indicated by marking “**(draft and final)**” after the product name in the “Products” section of the task/subtask. If “(draft and final)” does not appear after the product name, only a final version of the product is required. With respect to due dates within this Scope of Work, “**days**” means working days.

³ California Public Resources Code, Section 25711.5(a) also requires EPIC-funded projects to lead to technological advancement and breakthroughs to overcome barriers that prevent the achievement of the state's statutory and energy goals.

Exhibit A

Scope of Work

The Recipient shall:

For products that require a draft version, including the Final Report Outline and Final Report

- Submit all draft products to the CAM for review and comment in accordance with the Project Schedule (Part V). The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt, unless otherwise specified in the task/subtask for which the product is required.
- Consider incorporating all CAM comments into the final product. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product.
- Submit the revised product and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period, or approves a request for additional time.

For products that require a final version only

- Submit the product to the CAM for acceptance. The CAM may request minor revisions or explanations prior to acceptance.

For all products

- Submit all data and documents required as products in accordance with the following:

Instructions for Submitting Electronic Files and Developing Software:

○ **Electronic File Format**

- Submit all data and documents required as products under this Agreement in an electronic file format that is fully editable and compatible with the Energy Commission's software and Microsoft (MS)-operating computing platforms, or with any other format approved by the CAM. Deliver an electronic copy of the full text of any Agreement data and documents in a format specified by the CAM, such as memory stick or CD-ROM.

The following describes the accepted formats for electronic data and documents provided to the Energy Commission as products under this Agreement, and establishes the software versions that will be required to review and approve all software products:

- Data sets will be in MS Access or MS Excel file format (version 2007 or later), or any other format approved by the CAM.
- Text documents will be in MS Word file format, version 2007 or later.
- Documents intended for public distribution will be in PDF file format.
- The Recipient must also provide the native Microsoft file format.
- Project management documents will be in Microsoft Project file format, version 2007 or later.

Exhibit A

Scope of Work

○ **Software Application Development**

Use the following standard Application Architecture components in compatible versions for any software application development required by this Agreement (e.g., databases, models, modeling tools), unless the CAM approves other software applications such as open source programs:

- Microsoft ASP.NET framework (version 3.5 and up). Recommend 4.0.
- Microsoft Internet Information Services (IIS), (version 6 and up) Recommend 7.5.
- Visual Studio.NET (version 2008 and up). Recommend 2010.
- C# Programming Language with Presentation (UI), Business Object and Data Layers.
- SQL (Structured Query Language).
- Microsoft SQL Server 2008, Stored Procedures. Recommend 2008 R2.
- Microsoft SQL Reporting Services. Recommend 2008 R2.
- XML (external interfaces).

Any exceptions to the Electronic File Format requirements above must be approved in writing by the CAM. The CAM will consult with the Energy Commission's Information Technology Services Branch to determine whether the exceptions are allowable.

MEETINGS

Subtask 1.2 Kick-off Meeting

The goal of this subtask is to establish the lines of communication and procedures for implementing this Agreement.

The Recipient shall:

- Attend a "Kick-off" meeting with the CAM, the Commission Agreement Officer (CAO), and any other Energy Commission staff relevant to the Agreement. The Recipient will bring its Project Manager and any other individuals designated by the CAM to this meeting. The administrative and technical aspects of the Agreement will be discussed at the meeting. Prior to the meeting, the CAM will provide an agenda to all potential meeting participants. The meeting may take place in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

The administrative portion of the meeting will include discussion of the following:

- Terms and conditions of the Agreement;
- Administrative products (subtask 1.1);
- CPR meetings (subtask 1.3);
- Match fund documentation (subtask 1.7);
- Permit documentation (subtask 1.8);
- Subcontracts (subtask 1.9); and
- Any other relevant topics.

The technical portion of the meeting will include discussion of the following:

- The CAM's expectations for accomplishing tasks described in the Scope of Work;
- An updated Project Schedule;
- Technical products (subtask 1.1);

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Scope of Work

- Progress reports and invoices (subtask 1.5);
 - Final Report (subtask 1.6);
 - Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
 - Any other relevant topics.
- Provide an *Updated Project Schedule*, *List of Match Funds*, and *List of Permits*, as needed to reflect any changes in the documents.

The CAM shall:

- Designate the date and location of the meeting.
- Send the Recipient a *Kick-off Meeting Agenda*.

Recipient Products:

- Updated Project Schedule (*if applicable*)
- Updated List of Match Funds (*if applicable*)
- Updated List of Permits (*if applicable*)

CAM Product:

- Kick-off Meeting Agenda

Subtask 1.3 Critical Project Review (CPR) Meetings

The goal of this subtask is to determine if the project should continue to receive Energy Commission funding, and if so whether any modifications must be made to the tasks, products, schedule, or budget. CPR meetings provide the opportunity for frank discussions between the Energy Commission and the Recipient. As determined by the CAM, discussions may include project status, challenges, successes, advisory group findings and recommendations, final report preparation, and progress on technical transfer and production readiness activities (if applicable). Participants will include the CAM and the Recipient, and may include the CAO and any other individuals selected by the CAM to provide support to the Energy Commission.

CPR meetings generally take place at key, predetermined points in the Agreement, as determined by the CAM and as shown in the Task List on page 1 of this Exhibit. However, the CAM may schedule additional CPR meetings as necessary. The budget will be reallocated to cover the additional costs borne by the Recipient, but the overall Agreement amount will not increase. CPR meetings generally take place at the Energy Commission, but they may take place at another location, or may be conducted via electronic conferencing (e.g., WebEx) as determined by the CAM.

The Recipient shall:

- Prepare a *CPR Report* for each CPR meeting that: (1) discusses the progress of the Agreement toward achieving its goals and objectives; and (2) includes recommendations and conclusions regarding continued work on the project.
- Submit the CPR Report along with any other *Task Products* that correspond to the technical task for which the CPR meeting is required (i.e., if a CPR meeting is required for Task 2, submit the Task 2 products along with the CPR Report).
- Attend the CPR meeting.
- Present the CPR Report and any other required information at each CPR meeting.

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The CAM shall:

- Determine the location, date, and time of each CPR meeting with the Recipient's input.
- Send the Recipient a *CPR Agenda* and a *List of Expected CPR Participants* in advance of the CPR meeting. If applicable, the agenda will include a discussion of match funding and permits.
- Conduct and make a record of each CPR meeting. Provide the Recipient with a *Schedule for Providing a Progress Determination* on continuation of the project.
- Determine whether to continue the project, and if so whether modifications are needed to the tasks, schedule, products, or budget for the remainder of the Agreement. If the CAM concludes that satisfactory progress is not being made, this conclusion will be referred to the Deputy Director of the Energy Research and Development Division.
- Provide the Recipient with a *Progress Determination* on continuation of the project, in accordance with the schedule. The Progress Determination may include a requirement that the Recipient revise one or more products.

Recipient Products:

- CPR Report(s)
- Task Products (draft and/or final as specified in the task)

CAM Products:

- CPR Agenda
- List of Expected CPR Participants
- Schedule for Providing a Progress Determination
- Progress Determination

Subtask 1.4 Final Meeting

The goal of this subtask is to complete the closeout of this Agreement.

The Recipient shall:

- Meet with Energy Commission staff to present project findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement. This meeting will be attended by the Recipient and CAM, at a minimum. The meeting may occur in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be divided into two separate meetings at the CAM's discretion.

- The technical portion of the meeting will involve the presentation of findings, conclusions, and recommended next steps (if any) for the Agreement. The CAM will determine the appropriate meeting participants.
- The administrative portion of the meeting will involve a discussion with the CAM and the CAO of the following Agreement closeout items:
 - Disposition of any state-owned equipment.
 - Need to file a Uniform Commercial Code Financing Statement (Form UCC-1) regarding the Energy Commission's interest in patented technology.
 - The Energy Commission's request for specific "generated" data (not already provided in Agreement products).
 - Need to document the Recipient's disclosure of "subject inventions" developed under the Agreement.

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- “Surviving” Agreement provisions such as repayment provisions and confidential products.
- Final invoicing and release of retention.
- Prepare a *Final Meeting Agreement Summary* that documents any agreement made between the Recipient and Commission staff during the meeting.
- Prepare a *Schedule for Completing Agreement Closeout Activities*.
- Provide *All Draft and Final Written Products* on a CD-ROM or USB memory stick, organized by the tasks in the Agreement.

Products:

- Final Meeting Agreement Summary (*if applicable*)
- Schedule for Completing Agreement Closeout Activities
- All Draft and Final Written Products

REPORTS AND INVOICES

Subtask 1.5 Progress Reports and Invoices

The goals of this subtask are to: (1) periodically verify that satisfactory and continued progress is made towards achieving the project objectives of this Agreement; and (2) ensure that invoices contain all required information and are submitted in the appropriate format.

The Recipient shall:

- Submit a monthly *Progress Report* to the CAM. Each progress report must:
 - Summarize progress made on all Agreement activities as specified in the scope of work for the preceding month, including accomplishments, problems, milestones, products, schedule, fiscal status, and an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. See the Progress Report Format Attachment for the recommended specifications.
- Submit a monthly or quarterly *Invoice* that follows the instructions in the “Payment of Funds” section of the terms and conditions, including a financial report on Match Fund and in-state expenditures.

Products:

- Progress Reports
- Invoices

Subtask 1.6 Final Report

The goal of this subtask is to prepare a comprehensive Final Report that describes the original purpose, approach, results, and conclusions of the work performed under this Agreement. The CAM will review the Final Report, which will be due at least **two months** before the Agreement end date. When creating the Final Report Outline and the Final Report, the Recipient must use the Style Manual provided by the CAM.

Subtask 1.6.1 Final Report Outline

The Recipient shall:

- Prepare a *Final Report Outline* in accordance with the *Style Manual* provided by the CAM. (*See Task 1.1 for requirements for draft and final products.*)

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Recipient Products:

- Final Report Outline (draft and final)

CAM Product:

- Style Manual
- Comments on Draft Final Report Outline
- Acceptance of Final Report Outline

Subtask 1.6.2 Final Report

The Recipient shall:

- Prepare a *Final Report* for this Agreement in accordance with the approved Final Report Outline, Style Manual, and Final Report Template provided by the CAM with the following considerations:
 - Ensure that the report includes the following items, in the following order:
 - Cover page (**required**)
 - Credits page on the reverse side of cover with legal disclaimer (**required**)
 - Acknowledgements page (optional)
 - Preface (**required**)
 - Abstract, keywords, and citation page (**required**)
 - Table of Contents (**required**, followed by List of Figures and List of Tables, if needed)
 - Executive summary (**required**)
 - Body of the report (**required**)
 - References (if applicable)
 - Glossary/Acronyms (If more than 10 acronyms or abbreviations are used, it is required.)
 - Bibliography (if applicable)
 - Appendices (if applicable) (Create a separate volume if very large.)
 - Attachments (if applicable)
 - Ensure that the document is written in the third person.
 - Ensure that the Executive Summary is understandable to the lay public.
 - Briefly summarize the completed work. Succinctly describe the project results and whether or not the project goals were accomplished.
 - Identify which specific ratepayers can benefit from the project results and how they can achieve the benefits.
 - If it's necessary to use a technical term in the Executive Summary, provide a brief definition or explanation when the technical term is first used.
 - Follow the Style Guide format requirements for headings, figures/tables, citations, and acronyms/abbreviations.
 - Ensure that the document omits subjective comments and opinions. However, recommendations in the conclusion of the report are allowed.
 - Include a brief description of the project results in the Abstract.
- Submit a draft of the report to the CAM for review and comment. The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt
- Consider incorporating all CAM comments into the Final Report. If the Recipient disagrees with any comment, provide a written response explaining why the comment

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was not incorporated into the final product

- Submit the revised Final Report and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period or approves a request for additional time.
- Submit one bound copy of the *Final Report* to the CAM along with *Written Responses to Comments on the Draft Final Report*.

Products:

- Final Report (draft and final)
- Written Responses to Comments on the Draft Final Report

CAM Product:

- Written Comments on the Draft Final Report

MATCH FUNDS, PERMITS, AND SUBCONTRACTS

Subtask 1.7 Match Funds

The goal of this subtask is to ensure that the Recipient obtains any match funds planned for this Agreement and applies them to the Agreement during the Agreement term.

While the costs to obtain and document match funds are not reimbursable under this Agreement, the Recipient may spend match funds for this task. The Recipient may only spend match funds during the Agreement term, either concurrently or prior to the use of Energy Commission funds. Match funds must be identified in writing, and the Recipient must obtain any associated commitments before incurring any costs for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a *Match Funds Status Letter* that documents the match funds committed to this Agreement. If no match funds were part of the proposal that led to the Energy Commission awarding this Agreement and none have been identified at the time this Agreement starts, then state this in the letter.

If match funds were a part of the proposal that led to the Energy Commission awarding this Agreement, then provide in the letter:

- A list of the match funds that identifies:
 - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied.
 - The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the source (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.
 - If different from the solicitation application, provide a letter of commitment from an authorized representative of each source of match funding that the funds or contributions have been secured.

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- At the Kick-off meeting, discuss match funds and the impact on the project if they are significantly reduced or not obtained as committed. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide a *Supplemental Match Funds Notification Letter* to the CAM of receipt of additional match funds.
- Provide a *Match Funds Reduction Notification Letter* to the CAM if existing match funds are reduced during the course of the Agreement. Reduction of match funds may trigger a CPR meeting.

Products:

- Match Funds Status Letter
- Supplemental Match Funds Notification Letter *(if applicable)*
- Match Funds Reduction Notification Letter *(if applicable)*

Subtask 1.8 Permits

The goal of this subtask is to obtain all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track. Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement, with the exception of costs incurred by University of California recipients. Permits must be identified and obtained before the Recipient may incur any costs related to the use of the permit(s) for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a *Permit Status Letter* that documents the permits required to conduct this Agreement. If no permits are required at the start of this Agreement, then state this in the letter. If permits will be required during the course of the Agreement, provide in the letter:
 - A list of the permits that identifies: (1) the type of permit; and (2) the name, address, and telephone number of the permitting jurisdictions or lead agencies.
 - The schedule the Recipient will follow in applying for and obtaining the permits.

The list of permits and the schedule for obtaining them will be discussed at the Kick-off meeting (subtask 1.2), and a timetable for submitting the updated list, schedule, and copies of the permits will be developed. The impact on the project if the permits are not obtained in a timely fashion or are denied will also be discussed. If applicable, permits will be included as a line item in progress reports and will be a topic at CPR meetings.

- If during the course of the Agreement additional permits become necessary, then provide the CAM with an *Updated List of Permits* (including the appropriate information on each permit) and an *Updated Schedule for Acquiring Permits*.
- Send the CAM a *Copy of Each Approved Permit*.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the CAM within 5 days. Either of these events may trigger a CPR meeting.

Products:

- Permit Status Letter
- Updated List of Permits *(if applicable)*
- Updated Schedule for Acquiring Permits *(if applicable)*
- Copy of Each Approved Permit *(if applicable)*

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Subtask 1.9 Subcontracts

The goals of this subtask are to: (1) procure subcontracts required to carry out the tasks under this Agreement; and (2) ensure that the subcontracts are consistent with the terms and conditions of this Agreement.

The Recipient shall:

- Manage and coordinate subcontractor activities in accordance with the requirements of this Agreement.
- Incorporate this Agreement by reference into each subcontract.
- Include any required Energy Commission flow-down provisions in each subcontract, in addition to a statement that the terms of this Agreement will prevail if they conflict with the subcontract terms.
- If required by the CAM, submit a draft of each *Subcontract* required to conduct the work under this Agreement.
- Submit a final copy of the executed subcontract.
- Notify and receive written approval from the CAM prior to adding any new subcontractors (see the discussion of subcontractor additions in the terms and conditions).

Products:

- Subcontracts (*draft if required by the CAM*)

TECHNICAL ADVISORY COMMITTEE

Subtask 1.10 Technical Advisory Committee (TAC)

The goal of this subtask is to create an advisory committee for this Agreement. The TAC should be composed of diverse professionals. The composition will vary depending on interest, availability, and need. TAC members will serve at the CAM's discretion. The purpose of the TAC is to:

- Provide guidance in project direction. The guidance may include scope and methodologies, timing, and coordination with other projects. The guidance may be based on:
 - Technical area expertise;
 - Knowledge of market applications; or
 - Linkages between the agreement work and other past, present, or future projects (both public and private sectors) that TAC members are aware of in a particular area.
- Review products and provide recommendations for needed product adjustments, refinements, or enhancements.
- Evaluate the tangible benefits of the project to the state of California, and provide recommendations as needed to enhance the benefits.
- Provide recommendations regarding information dissemination, market pathways, or commercialization strategies relevant to the project products.

The TAC may be composed of qualified professionals spanning the following types of disciplines:

- Researchers knowledgeable about the project subject matter;
- Members of trades that will apply the results of the project (e.g., designers, engineers, architects, contractors, and trade representatives);
- Public interest market transformation implementers;

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- Product developers relevant to the project;
- U.S. Department of Energy research managers, or experts from other federal or state agencies relevant to the project;
- Public interest environmental groups;
- Utility representatives;
- Air district staff; and
- Members of relevant technical society committees.

The Recipient shall:

- Prepare a *List of Potential TAC Members* that includes the names, companies, physical and electronic addresses, and phone numbers of potential members. The list will be discussed at the Kick-off meeting, and a schedule for recruiting members and holding the first TAC meeting will be developed.
- Recruit TAC members. Ensure that each individual understands member obligations and the TAC meeting schedule developed in subtask 1.11.
- Prepare a *List of TAC Members* once all TAC members have committed to serving on the TAC.
- Submit *Documentation of TAC Member Commitment* (such as Letters of Acceptance) from each TAC member.

Products:

- List of Potential TAC Members
- List of TAC Members
- Documentation of TAC Member Commitment

Subtask 1.11 TAC Meetings

The goal of this subtask is for the TAC to provide strategic guidance for the project by participating in regular meetings, which may be held via teleconference.

The Recipient shall:

- Discuss the TAC meeting schedule with the CAM at the Kick-off meeting. Determine the number and location of meetings (in-person and via teleconference) in consultation with the CAM.
- Prepare a *TAC Meeting Schedule* that will be presented to the TAC members during recruiting. Revise the schedule after the first TAC meeting to incorporate meeting comments.
- Prepare a *TAC Meeting Agenda* and *TAC Meeting Back-up Materials* for each TAC meeting.
- Organize and lead TAC meetings in accordance with the TAC Meeting Schedule. Changes to the schedule must be pre-approved in writing by the CAM.
- Prepare *TAC Meeting Summaries* that include any recommended resolutions of major TAC issues.

Products:

- TAC Meeting Schedule (draft and final)
- TAC Meeting Agendas (draft and final)
- TAC Meeting Back-up Materials
- TAC Meeting Summaries

Exhibit A

Scope of Work

IV. TECHNICAL TASKS

TASK 2: PRE-INSTALLATION PREPARATIONS AND SYSTEM DEVELOPMENT

The goal of this task is to prepare the host facility for demonstration and to design, manufacture, and troubleshoot the PFO Concentrator system (or “system”) for concentration of juice. The first version of the PFO Concentrator system will be designed before any feedback from onsite operation is available, and will be referred to as ‘Mark I’.

The Recipient shall:

- Perform Preliminary Analysis and Develop Mark I System Design.
 - Evaluate the juice for the physical properties, such as brix⁴ and pH.
 - Perform preliminary experiments which includes, but is not limited to coordination with the host to select target final brix concentrations, operating temperature, clean-in-place (CIP) procedures, biological testing and procedures and targets, sanitization procedures, and draw solution testing and processing.
 - Consult with the host to determine whether the quality of the juice concentrate produced is acceptable for its intended use.
 - Coordinate with the host to estimate system requirements, including but not limited to, the processing capacity, flow rates, and energy consumption.
 - Design the Mark I PFO Concentrator system based on the analyses conducted in this subtask, the site inputs and outputs (product flows, ambient temperature, heating cooling, and electrical), and the needs of the host.
- Prepare Host Facility for Installation.
 - Conduct site inspections and perform minor improvements to the host facility, with as little impact on the facility’s existing production activities, as possible. This includes, space allocation, installing new heating or cooling lines, and tank installation.
- Manufacture and Troubleshoot the Mark I System.
 - Manufacture the PFO Concentrator system at Porifera’s facilities.
 - Perform startup activities at Porifera’s facilities to test for installation readiness, and provide all necessary adjustments to debug the system and improve overall efficiency. Components and sub-systems may be tested individually before assembly of the full system.
- Develop a draft *Installation Guidelines* for the PFO Concentrator. This document is intended to prepare the host for the PFO Concentrator installation, based on the preliminary analysis and Mark I design.
 - The guidelines will include the anticipated electrical and fluid inputs, site requirements (e.g., heating and cooling), installation procedures, operational footprint, and tank(s) necessary for processing and storage.
 - The guidelines will be updated for final approval at the end of the project.

Products:

- Installation Guidelines (draft) (Final version to be delivered under Task 4)

⁴ Brix is the measurement of dissolved sugar or carbohydrates in an aqueous solution.

Exhibit A

Scope of Work

TASK 3: SEASON 1 OPERATION AND ANALYSIS

The goal of this task is to install and operate the Mark I system for concentration of juice during the first watermelon processing season at the host site. The system will be tested and product samples will be collected for analysis and customer feedback throughout the first season.

The Recipient shall:

- Install and Operate the Mark I System.
 - Install the system at the host site.
 - Perform startup and troubleshooting activities to ensure the system is installed and operating correctly.
 - Operate the system at the site and collect product.
 - Monitor the system's performance.
- Analyze Product and Process.
 - Analyze samples of both the initial juice and the product to quantify the flavor, color, draw solute, and/or nutrient content and compare the samples to thermally-processed concentrates.
 - Recommend process and system improvements for the Mark II, based on the sample analysis.
 - Develop a *Test Plan for PFO Concentrator System*, that includes, but is not limited to: detailed descriptions of measurements that will be performed to demonstrate product quality, factors to monitor for performance optimization, and appropriate sampling procedures.
- Create a *Season 1 Summary Report*.
 - Develop a draft report that summarizes the installation and operational efforts of the first season. The report shall include, but not be limited to: the test plan and data from initial testing, product quality, lessons learned, a process flow diagram of the system, and photographs of the Mark I system installed at the site.
 - Submit the draft *Season 1 Summary Report* to the CAM and TAC for review and feedback.
 - Incorporate edits as necessary, based on CAM and TAC feedback, and submit the final summary report to the CAM for approval.

Products:

- Test Plan for PFO Concentrator System
- Season 1 Summary Report (draft and final)

TASK 4: SEASONS 2 & 3 OPERATION, OPTIMIZATION, AND PRODUCT ANALYSIS

The goal of this task is to optimize the conditions and the system to demonstrate benefits for the customer. The recipient will install and operate the Mark II and Mark III systems in seasons 2 and 3 of the watermelon processing, respectively, and perform analyses throughout the processing and post-seasons.

The Recipient shall:

- Recommend Improvements and Modify System.
 - Troubleshoot technical hurdles that arose during Mark I and Mark II operation.
 - Recommend improvements to the system, procure components, and modify the system for improved product and/or for more efficient operation during the second and the third season. The system improvements for the Mark II and

Exhibit A

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Mark III shall take into account recommendations from previous tasks, analysis of product samples, and host feedback, as necessary, for improved system operation.

- Install and Operate Mark II and Mark III.
 - Install and operate the Mark II system for the second season under various processing conditions to fine tune operating parameters.
 - Generate samples under different processing conditions (watermelon cleaning, juicing process, operating conditions) with the Mark II system.
 - Install and operate the Mark III system (the final configuration) for the third season, implementing its final process conditions.
 - Generate samples under different processing conditions (watermelon cleaning, juicing process, operating conditions) with the Mark III system.
 - Develop a draft *Season 2 Summary Report* and a *Season 3 Summary Report* at the end of each respective season. These reports will summarize Porifera's efforts on improved processing and product quality. The reports shall include, but are not limited to, activities performed in the operating season, data from sample analysis, a process flow diagram of the system, photographs of the system installed at the site, and results of the products produced.
 - Submit the draft Season 2 Summary Report and draft Season 3 Summary Report to the CAM for review and approval.
 - Incorporate edits as necessary, based on CAM feedback, and submit the final Season 2 Summary Report and final Season Summary Report to the CAM for review and approval.
 - Update and finalize *Installation Guidelines* based on Season 3 operation requirements and submit it to the CAM for review and approval.
- Perform Product and Process Analysis on Watermelon Samples.
 - Analyze samples of both the initial juice and the product concentrate from the Mark II, and Mark III systems to quantify the flavor, color, draw solute, and/or nutrient content and compare the samples to thermally-processed concentrates.
 - Draw solution and water produced from the system shall be tested as needed. The recipient shall analyze the samples to quantify the flavor, color, and/or nutrient content and compare to thermally-processed concentrates.
 - Recommend process and system improvements for Mark III based on the sample analysis.
- Study and Recommend Clean-in-Place Procedures
 - Study and recommend CIP procedures for long-term operation to maintain steady membrane performance during operation. CIP procedures are highly dependent on operating conditions, such as temperature, pH, and brix.
 - After the second season, develop a draft *Operation and Clean-in-Place Manual* that outlines the cleaning solution and long-term operation strategies determined earlier in the task, as well a maintenance schedule. Submit this manual to the CAM.
 - After the third season, finalize the *Operation and Clean-in-Place Manual* that outlines the cleaning solution and long-term operation strategies determined earlier in the task, as well a maintenance schedule. Submit this manual to the CAM for review and approval.
- Prepare a *CPR Report #1* in accordance with Subtask 1.3 (CPR Meetings).
- Participate in a CPR meeting.

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Products:

- Season 2 Summary Report (draft and final)
- Season 3 Summary Report (draft and final)
- Installation Guidelines (final)
- Operation and Clean-in-Place Manual (draft and final)
- CPR Report #1

TASK 5: PRODUCT ANALYSIS FOR ADDITIONAL PRODUCTS

The goal of this task is to demonstrate the applications of the PFO Concentrator system with other products. This will prove the breadth of possibilities with small single-batch pilot studies.

The Recipient shall:

- Study Concentrator Food and Beverage Processing.
 - Perform sample studies on products including, but not limited to, strawberries, blueberries, oranges, coffee, tea, and milk.
 - Generate samples for freeze-drying studies of the concentrator-produced watermelon, as well as other products with PFO bench-scale equipment.
 - Prepare a *Juice Processing Report* that is graphic heavy and includes, but is not limited to, a high-level and non-technical summary of the completed food and beverage processing, sample results, and points out any innovative or unique features. Submit this report to the CAM for review and approval.
 - Prepare an *Applications Beyond Watermelon Processing Memo* that includes but is not limited to a high-level and non-technical summary of the tested food and beverages, results, lessons learned, and market readiness of the potential products beyond watermelon concentration. Submit this memo to the CAM for review and approval.

Products:

- Juice Processing Report
- Applications Beyond Watermelon Processing Memo

TASK 6: MEASUREMENT AND VERIFICATION

The goal of this task is to perform measurement and verification (M&V) of the Mark II and Mark III systems to test for product quality, as well as the energy use, and clean water production. The recipient will perform internal testing of the Mark II system. An independent third-party will conduct M&V of the Mark III system.

The Recipient shall:

- Conduct internal and independent, third-party M&V testing of the Mark II and Mark III systems. Key performance factors include, but are not limited to, the brix of the source and concentrated product quality, flow and volumes, water volumes and quality removed from the product for reuse, and the energy inputs necessary to create both a concentrated liquid and a freeze-dried powder.
- Submit the unedited *Independent Third-party Evaluator's Measurement and Verification Report* on the Mark III, to the CAM.
- Prepare a *Measurement and Verification Report*.

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- Develop a draft report that includes, but is not limited to, the detailed description of the Mark III system's operation performance, measurements performed, the results for the site and whether agreement goals and objectives were met (e.g., including the product quality and energy consumption).
- Submit the draft report for the CAM and TAC review, and incorporate necessary edits, per the feedback provided.
- Submit the final report for CAM review and approval.

Products:

- Independent Third-Party Evaluator's Measurement and Verification Report
- Measurement and Verification Report (draft and final)

TASK 6: EVALUATION OF PROJECT BENEFITS

The goal of this task is to report the benefits resulting from this project.

The Recipient shall:

- Complete three Project Benefits Questionnaires that correspond to three main intervals in the Agreement: (1) *Kick-off Meeting Benefits Questionnaire*; (2) *Mid-term Benefits Questionnaire*; and (3) *Final Meeting Benefits Questionnaire*.
- Provide all key assumptions used to estimate projected benefits, including targeted market sector (e.g., population and geographic location), projected market penetration, baseline and projected energy use and cost, operating conditions, and emission reduction calculations. Examples of information that may be requested in the questionnaires include:
 - For Product Development Projects and Project Demonstrations:
 - Published documents, including date, title, and periodical name.
 - Estimated or actual energy and cost savings, and estimated statewide energy savings once market potential has been realized. Identify all assumptions used in the estimates.
 - Greenhouse gas and criteria emissions reductions.
 - Other non-energy benefits such as reliability, public safety, lower operational cost, environmental improvement, indoor environmental quality, and societal benefits.
 - Data on potential job creation, market potential, economic development, and increased state revenue as a result of the project.
 - A discussion of project product downloads from websites, and publications in technical journals.
 - A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.
 - Additional Information for Product Development Projects:
 - Outcome of product development efforts, such copyrights and license agreements.
 - Units sold or projected to be sold in California and outside of California.
 - Total annual sales or projected annual sales (in dollars) of products developed under the Agreement.

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- Investment dollars/follow-on private funding as a result of Energy Commission funding.
- Patent numbers and applications, along with dates and brief descriptions.
- Additional Information for Product Demonstrations:
 - Outcome of demonstrations and status of technology.
 - Number of similar installations.
 - Jobs created/retained as a result of the Agreement.
- For Information/Tools and Other Research Studies:
 - Outcome of project.
 - Published documents, including date, title, and periodical name.
 - A discussion of policy development. State if the project has been cited in government policy publications or technical journals, or has been used to inform regulatory bodies.
 - The number of website downloads.
 - An estimate of how the project information has affected energy use and cost, or have resulted in other non-energy benefits.
 - An estimate of energy and non-energy benefits.
 - Data on potential job creation, market potential, economic development, and increased state revenue as a result of project.
 - A discussion of project product downloads from websites, and publications in technical journals.
 - A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.
- Respond to CAM questions regarding responses to the questionnaires.

The Energy Commission may send the Recipient similar questionnaires after the Agreement term ends. Responses to these questionnaires will be voluntary.

Products:

- Kick-off Meeting Benefits Questionnaire
- Mid-term Benefits Questionnaire
- Final Meeting Benefits Questionnaire

TASK 7: TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES

The goal of this task is to develop a plan to make the knowledge gained, experimental results, and lessons learned available to the public and key decision makers.

The Recipient shall:

- Prepare an *Initial Fact Sheet* at start of the project that describes the project. Use the format provided by the CAM.
- Prepare a *Final Project Fact Sheet* at the project's conclusion that discusses results. Use the format provided by the CAM.
- Prepare a *Technology/Knowledge Transfer Plan* that includes:
 - An explanation of how the knowledge gained from the project will be made available to the public, including the targeted market sector and potential outreach to end

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- users, utilities, regulatory agencies, and others.
- A description of the intended use(s) for and users of the project results.
- Published documents, including date, title, and periodical name.
- Copies of documents, fact sheets, journal articles, press releases, and other documents prepared for public dissemination. These documents must include the Legal Notice required in the terms and conditions. Indicate where and when the documents were disseminated.
- A discussion of policy development. State if project has been or will be cited in government policy publications, or used to inform regulatory bodies.
- The number of website downloads or public requests for project results.
- Additional areas as determined by the CAM.
- Conduct technology transfer activities in accordance with the Technology/Knowledge Transfer Plan. These activities will be reported in the Progress Reports.
- When directed by the CAM, develop *Presentation Materials* for an Energy Commission-sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the California Energy Commission.
- Provide at least (6) six *High Quality Digital Photographs* (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.
- Prepare a *Technology/Knowledge Transfer Report* on technology transfer activities conducted during the project.

Products:

- Initial Fact Sheet (draft and final)
- Final Project Fact Sheet (draft and final)
- Presentation Materials (draft and final)
- High Quality Digital Photographs
- Technology/Knowledge Transfer Plan (draft and final)
- Technology/Knowledge Transfer Report (draft and final)

TASK 8 Production Readiness Plan

The goal of this task is to determine the steps that will lead to the manufacturing of technologies developed in this project or to the commercialization of the project's results.

The Recipient shall:

- Prepare a *Production Readiness Plan*. The degree of detail in the plan should be proportional to the complexity of producing or commercializing the proposed product, and to its state of development. As appropriate, the plan will discuss the following:
 - Critical production processes, equipment, facilities, personnel resources, and support systems needed to produce a commercially viable product.
 - Internal manufacturing facilities, supplier technologies, capacity constraints imposed by the design under consideration, design-critical elements, and the use of hazardous or non-recyclable materials. The product manufacturing effort may include "proof of production processes."
 - The estimated cost of production.
 - The expected investment threshold needed to launch the commercial product.
 - An implementation plan to ramp up to full production.

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- The outcome of product development efforts, such as copyrights and license agreements.
- Patent numbers and applications, along with dates and brief descriptions.
- Other areas as determined by the CAM.

Products:

- Production Readiness Plan (draft and final)

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: CERRITOS COMMUNITY COLLEGE DISTRICT

RESOLVED, that the State Energy Resources Conservation and Development Commission (Energy Commission) adopts the staff CEQA findings contained in the Agreement or Amendment Request Form (as applicable); and

RESOLVED, that the Energy Commission approves Amendment 2 to Agreement 600-16-005 with Cerritos Community College District for an augmentation of \$1,000,000 and an 18-month time extension, and adopting staff's determination that this action is exempt from the California Environmental Quality Act (CEQA). Cerritos Community College District is the host for Advanced Transportation and Logistics (ATL), an initiative of the California Community Colleges Chancellor's Office. Under this contract, the District's ATL will continue to develop and implement clean fuel career pilot programs for high schools, focusing on underserved communities, minority groups and regions impacted by poor air quality. The amendment could potentially double the number of high schools receiving the program; and

FURTHER BE IT RESOLVED, that the Executive Director or his/her designee shall execute the same on behalf of the Energy Commission.

CERTIFICATION

The undersigned Secretariat to the Commission does hereby certify that the foregoing is a full, true, and correct copy of a Resolution duly and regularly adopted at a meeting of the California Energy Commission held on March 12, 2019.

AYE: [List of Commissioners]

NAY: [List of Commissioners]

ABSENT: [List of Commissioners]

ABSTAIN: [List of Commissioners]

Cody Goldthrite,
Secretariat