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2.12. Liability Insurance

2.12.1. Proposed Pilot-Scale Project (SzIBR)

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The operation of the proposed pilot process will be covered under existing Property Policy and renewals thereof will have responsibility for managing liability with respect to outside parties. Potential liabilities between the project team members will be covered in the contracts between them.

2.12.2. Forecasted Commercial Facility (ComIBR)

The forecasted commercial facility will be covered under comparable policies. The processes involved are similar to those in widespread use in many industries and pose no special hazards or environmental concerns. As a result, we do not anticipate any difficulty obtaining suitable coverage.

2.13. Prospective Customers

2.13.1. Proposed Pilot-Scale Project (SzIBR)

The disposition of biofuels produced within the project scope is discussed in PEP Section 9.6.

2.13.2. Forecasted Commercial Facility (ComIBR)

Prospective direct customers for algal oil produced at ComIBR include most domestic biodiesel and petroleum refiners. Renewable Energy Group, the largest refiner and marketer of biodiesel in the US, has expressed strong interest in selling algal biofuels derived from Solazyme's process. Solazyme has also entered into a joint development and testing agreement with Chevron and has held discussions with several other leading domestic energy companies.

2.14. Configuration Control Management Plan Summary

In the proposed project, no products will be sold, and no formal configuration control management plan will be implemented. (See PEP Section 9.6 for a discussion of the disposition of fuels produced at SzIBR.) REG, however, plans to handle the purified algal oil it receives and the biodiesel it refines in accordance with Solazyme will also systematically collect extensive process data throughout the project (cf. PEP Sections 6.4-6.5), record them in a robust database, and correlate them with REG and UOP's fuels data. Formal change control procedures, status accounting, verification and auditing are not necessary for SzIBR. At commercial scale, a formal configuration control plan will be documented and implemented at ComIBR. We anticipate, however.

2.15. Technology and Market Conditions

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2.15.1. Biodiesel

Biodiesel (ASTM D6751) is a certified and accepted fuel. Inspectorate America Corporation and the Southwest Research Institute have both independently verified that biodiesel refined from Solazyme's algal oil complies with all of the specifications. REG has determined that it exceeds the requirements for the company's highest value biodiesel, REG-9000-1. (See fuel analyses in PFD file.) The only issue remaining for certification is whether algal oil is considered to be a different type of fuel feedstock, and therefore requires additional EPA testing prior to certification. We believe that additional testing will not be required. The current ASTM specification identifies feedstocks "from vegetable oils or animal fat" as appropriate for biodiesel, though other feedstocks including brown grease and used cooking oil are currently in commercial use. According to Steve Howell, Chairman of the ASTM Biodiesel working group, when ASTM D6751 was approved, EPA accepted the argument that the final Fatty Acid Methyl Ester (FAME) produced in the biodiesel refining process is substantially similar whether derived from vegetable oils or from animal fats, so only one certification process was required. Don Scott of the National Biodiesel Board asserts that the list of vegetable oils and animal fat in the IRS code and EPA regulations is illustrative but not restrictive. As stated in the EPA biodiesel factsheet: *Guidance for Biodiesel Producers and Biodiesel Blenders/Users* (Document EPA420-B-07-019): "In the United States, most bio-

diesel is made from soybean oil. However, canola oil, sunflower oil, recycled cooking oils, palm oil, animal fats, and other oils are also used as feedstocks." Algal oil is an "other oil", and it is substantially similar to canola oil. To further clarify this issue, the ASTM biodiesel subcommittee intends to address this ambiguity and officially include oils derived from algae and other microorganisms as feedstocks for biodiesel.

Domestic sales of biodiesel had surged over the past few years to reach ~700 Mgal in 2008, but have since declined sharply with the fall of crude oil prices, which have made refining biodiesel unprofitable for most refiners at current feedstock prices. The ongoing trade dispute with the European Union has reduced exports. Many biodiesel production facilities are either idle or operating at very low production levels. On the positive side, consumer acceptance and awareness of biodiesel continue to increase, and the environmental benefits of biodiesel have been firmly established; the net energy balance of biodiesel has been investigated and found to be extremely positive.

We expect that as oil prices return over the next few years to the EIA's trend predictions, biodiesel sales will resume their climb, further aided by the RFS. By the time ComIBR is operational, the market dynamic will have reversed itself completely. Rather than being demand limited, biodiesel production will be constrained by limited supply of oil feedstocks to at most a few billion gallons per year. Capacity to expand agricultural production of oilseed crops is extremely limited and on the margin encroaches on corn production. REG and all the other biodiesel companies cannot foresee any other practical source of oil feedstocks to expand production, except for algae. Solazyme's process will utilize agricultural by-products or wastes, energy crops that grow on marginal land unsuitable for cultivation of traditional oil crops, or other types of lignocellulosic feedstocks that do not compete with food production.

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2.15.2. Renewable Diesel

Renewable diesel meets the same specification as petroleum diesel (ASTM D975) and therefore more closely resembles currently available petroleum diesel products than biodiesel. However, the EPA has not yet certified renewable diesel for sale in the United States. In Europe, Neste Oil has been producing and selling renewable diesel since 2007. Dynamic Fuels (a joint venture between Syntroleum, Inc. and Tyson Foods) is expected to complete construction of the first renewable diesel fuel refining facility in the US in early 2010. ConocoPhillips has already received certification for a renewable diesel fuel made from co-processing triglycerides. Other groups, including team member UOP, have been producing certification quantities of renewable diesel. Because the hydrotreating process takes all feedstocks to normal paraffins, which are then isomerized and fractionated, the chemical composition of the final product is independent of the feedstock. Thus, once a renewable diesel facility is certified for fuel production, no further testing will be required in order to use algae oil as a renewable diesel feedstock.

UOP has refined Solazyme's algal oil into renewable diesel that fully complies with ASTM D975 using the company's proprietary Ecofining process. Jennifer Holmgren, UOP's Director of Renewable Energy and Chemicals, has stated that "Solazyme's algal oil can be converted to 'true' diesel fuel at high yield with desirable properties."

The process for registering renewable diesel with the EPA includes filing Form 3520-12. This form will be accompanied with support information including:

- Detailed description of the renewable diesel production
- Description of pre-treatment/cleanup for each of the feeds and quality targets achieved
- Details on feedstock types pilot tested and converted to renewable diesel
- Data that demonstrate consistent product quality irrespective of feedstock used (if product properties vary, present data or analysis to demonstrate the impact of any difference on composition and effect on emission controls)
- Detailed analytical data on renewable diesel with comparison to ULSD – Chemical, Distillation, Viscosity, Gravity, Aromatics, etc.

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- All analytical and other support data to demonstrate that renewable diesel meets ASTM D975.
- Analytical data to demonstrate that contaminants such as halogens, phosphorous, metals, etc. are not present in renewable diesel (if any contaminants are present, data or analysis to demonstrate the impact of purities on composition and effect on emission controls).

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Although Solazyme intends to take a leading role in ensuring the fuels derived from algal oil comply with all applicable standards and meet all applicable licensing and certification requirements, ultimately the refiners that purchase algal oil from Solazyme will bear responsibility for the regulatory compliance of the finished fuels that they refine and sell. PEP Section 9.6 describes how Solazyme intends to use the fuel produced as part of the project to help ensure market acceptance.

Renewable diesel will be completely fungible with petroleum diesel, but it will likely sell at a premium because it will help blenders to comply with RFS requirements; the high cetane number and low sulfur content of Solazyme's renewable diesel also increases its value as a blend stock. Alternatively, neat renewable algal diesel could potentially command a premium from environmentally-aware consumers and businesses. At this point, it is difficult to predict whether biodiesel or renewable diesel, and whether neat formulations or blends will return the greatest value on algal oil. Solazyme's commercialization pathway is flexible and remains agnostic on these questions. (The product pricing in the pro forma financials reflects blended biodiesel for definiteness and because reliable market data is available, but does not imply an early preference.)

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3. Feedstocks for a Commercial-Scale Facility

3.1. Projected First Commercial-Scale Facility

According to the EPA, more than 200 billion tons of municipal solid waste (MSW) are being generated annually in the United States. With current recovery technologies (including recycling and source separation), more than 160 billion tons of this material are landfilled and unutilized. The organic fraction of this material will undergo slow anaerobic digestion and, unless captured for energy generation, will release the resulting GHG to the atmosphere. A significant fraction of this material can be recovered and used as a source of feedstock for the production of transportation fuels.

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4. NEPA and Other Environmental Compliance for a Forecasted Commercial Facility

Although Solazyme anticipates that ComIBR will be designed, constructed, and operated entirely with private funds, the project may still be subject to review under the NEPA. If ComIBR will be located on federal lands or will require authorization by a federal agency (e.g., if the facility will impact wetlands or waterbodies, requiring a federal permit from the U.S. Corps of Engineers), it will be the individual permit authorizing agency's discretion to determine if issuing the permit will constitute a major federal undertaking necessitating a NEPA review. If ComIBR is privately funded and will not require issuance of a permit or authorization of an activity by a federal agency, then review of the project under NEPA will not be required. Examples of environmental permits that may be required for ComIBR are listed in Table BCP-2.

Agency	Permit/Approval/Consultation
Potential Federal	
Advisory Council on Historic Preservation	Consultation regarding impacts on cultural resources under Section 106 of the National Historic Preservation Act (NHPA)
U.S. Army Corps of Engineers	Permits under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act
U.S. Environmental Protection Agency	Review and comment on Section 404 permits issued by the COE (if applicable); National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges in certain states.
U.S. Department of Agriculture, Natural Resources Conservation Service	Consultation regarding erosion control and revegetation; Consultation for construction on lands enrolled in the Conservation Reserve Program (if applicable)
U.S. Department of the Interior, U.S. Fish & Wildlife Service	Consultation on threatened and endangered species under Section 7 of the Endangered Species Act (ESA); Consultation under the Migratory Bird Treaty Act and the Fish and Wildlife Coordination Act
Potential State Permits	
State Dept. of Environmental Quality	Environmental Review for consistency with state environmental regulations (Document required may be similar to EA or EIS - Not required in all states); Industrial Facility Siting Permit (if applicable); NPDES permit for construction stormwater discharges; Water quality certification under Section 401 of the CWA (required with the COE permit); NPDES industrial storm water discharge permit; NPDES individual industrial process water discharge permit; Ground water well permit (if applicable); Construction Air Emission Permit; Operating Air Emission Permit
State Division of Wildlife	Consultation for state-listed sensitive species
State Dept. of Natural Resources	Land use license for crossing navigable waterways (if applicable); Right-of-way grant for crossing state lands (if required)
State Dept. of Transportation	Encroachment permits for roads to the facility
State Floodplain Administrator	Permit for new construction within designated 100-year floodplains (if applicable)
State Historic Preservation Office	Consultation regarding impacts on cultural resources under Section 106 of the NHPA or state cultural resource laws if Section 106 is not applicable
Potential Local Permits	
County Authority	Land use zoning amendment; Dust Control Permit; Grading Permit; Building Permits

Table BCP-2. Potential Environmental Permits, Approvals, and Consultations

5. Energy and Environmental Life-Cycle Analysis

The separate LCA_GHG Attachment analyzes the

as well as for an alternate scenario (utilizing switchgrass as the feedstock with Abengoa as the front-end partner).

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Waste streams and emissions at commercial scale are discussed in Section 2.11.2 and PEP Section 3.8.2. Waste streams and emissions at pilot scale are discussed in PEP Section 8 and the Environmental Questionnaire.

6. Solazyme's Core Competencies and Experience for Commercialization

This section complements PEP Section 13 and focuses on the experience of Solazyme's business staff.

Troy J. Campione, **Senior Vice President of Business Development** will assume responsibility for all business milestones related to commercialization activities that will run separately from but in parallel with the proposed project. Dr. Campione was most recently Vice President and General Manager, Research Collaborations, Strategic Alliances and Materials Licensing for Symyx Technologies, Inc., a high throughput materials discovery company. During his seven years at Symyx, he was directly responsible for securing over $400 million dollars of research and development commitments, hardware and software purchases and advanced royalties. Prior to that Dr. Campione enjoyed a 15 year career with ExxonMobil where he held a variety of business, operations and technology leadership positions. His responsibilities at Exxon included management, strategy, and planning for Intermediates' $1B Vinyl business segment; laboratory, pilot plant, commercial and multi-site operations management; and leadership of a wide range of R&D activities, including major ventures, corporate, academic, institution and JV partner research across the full spectrum of Exxon Chemicals' business interests. He received a PhD in Chemical Engineering from the University of Texas at Austin, and ME and BS degrees in Chemical Engineering from Tulane University in New Orleans.

Tyler Painter, Chief Financial Officer, will assume responsibility for financing activities. Tyler has over 15 years experience in senior financial positions at companies such as PMC Sierra and Wind River Systems Inc. He has extensive capital structuring experience raising over $500 million in equity and debt in both private and public markets, was a corporate officer of a $1B public software company (Wind River Systems) with direct responsibility for managing corporate assets in excess of $200 million, and winner of the 2006 Pinnacle Award for Risk Management from the Association of Financial Professionals for creating industry leading approach to global treasury and finance operations that enhanced internal controls and resulted in over $500K of annual savings. He received his BS in Business Administration and Finance from Cal Poly in San Luis Obispo, California.

Dr. Harrison Dillon, President, Chief Technology Officer and Co-Founder, is an expert in microalgal genetics. He completed his Ph.D. research, including X-ray crystallography and quantitative trait loci characterization, under the direction of Dr. Jean-Marc Lalouel at the University of Utah. Dr. Dillon formerly managed the biotechnology patent portfolio in the University of Utah's Technology Transfer Office. Dr. Dillon received a J.D. cum laude from Duke University School of Law and is licensed to practice before the United States Patent and Trademark Office. He is a member of the State Bar of California and he also worked as an Associate in the Biotechnology Group at Townsend and Townsend and Crew. Dr.

Dillon has authored articles in scientific, business, and legal journals, and is an inventor on over 30 patents and patent applications owned by Solazyme.

Jonathan Wolfson, CEO and Co-Founder, has negotiated a range of commercial relationships with international energy, chemical, and other companies while at Solazyme. He was most recently the Vice President of Finance and Business Development for 7thOnline, a venture-backed supply chain software company where he was responsible for overseeing legal issues, finance and the development and implementation of corporate strategy, which resulted in annualized revenue growth of over 100% during his tenure. Mr. Wolfson was also a primary interface between the company's management and its board and investors. Prior to that Mr. Wolfson was a co-founder and President and Chief Operating Officer of InvestorTree, a financial software and ASP services firm. At InvestorTree, he was responsible for operations and for obtaining major clients including Fidelity Investments, AXA, Fiserv, Raymond James and others. Previously he worked as an investment banker for Morgan Stanley, in the M&A department of Fried, Frank, Harris, Shriver & Jacobson and as a business/legal analyst for Triarc Companies. Mr. Wolfson holds J.D. and M.B.A. degrees from the NYU School of Law and the NYU Stern School of Business. Additionally, he spent several years as an Adjunct Assistant Professor of Economics at Hunter College of the City University of New York.

7. Commitment to the Project

I am Jonathan Wolfson, Co-Founder, Chief Executive Officer, and member of the Board of Directors of Solazyme. I declare that

- Among many others, six of the company's seven most senior executives have been actively engaged in preparing this proposal. I personally have devoted approximately one-third of my time over the past six weeks to issues directly relating to this proposal and I have reviewed the Project Execution Plan, and supporting materials. Every element of the proposal has been prepared or reviewed by at least two senior executives and accurately represents the company's plans.
- The proposed effort lies directly on Solazyme's critical business path.
- Negotiations and discussions with all of the project team members have involved senior executives of the partner companies.
- If DOE selects this proposal for an award, negotiating and closing the contract will be a top priority for the company. Solazyme is ready to begin executing this project, and can and will begin in earnest as soon as funding is committed.
- I understand the risks associated with the proposal and the proposed project.

Affirmed by

Jonathan Wolfson
CEO Solazyme Inc.

The data contained in every page (pages 1 to 15) of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government's right to use or disclose data obtained without restriction from any source, including the applicant.

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Environmental Questionnaire for FOA Applicants
(To Be Completed by Applicant)

PART I: General Information

Applicant Name: Solazyme, Inc.
Proposed Project Title: Solazyme Integrated Biorefinery
Solicitation Number: DOE FOA-0000096
Applicant Preparer:
Applicant Phone: REDACTED EXEMPTION 4 REDACTED EXEMPTION 6
Applicant Email:

1. Please describe the intended use of DOE funding in your proposed project. For example, would the funding be applied to the entire project or only support a phase of the project? Describe the activity as specifically as possible, i.e. planning, feasibility study, design, data analysis, education or outreach activities, construction, capital purchase and/or equipment installation or modification.

   Solazyme, Inc. (Solazyme) intends to use DOE funding for all aspects of the Solazyme Integrated Biorefinery (SzIBR) project proposed for funding under DOE FOA-0000096. *Solazyme proposes to build, operate, and optimize a pilot-scale integrated biorefinery in order to demonstrate an integrated scale-up of its heterotrophic algal oil biomanufacturing process and to validate the projected commercial-scale economics.*

   One of Solazyme's main intents is to show that the SzIBR process can be used to produce inexpensive, high-quality renewable oil with current industrial biomanufacturing technology usable by the existing petroleum refining, distribution, and retail infrastructure grid. In order to demonstrate this concept, Solazyme will be utilizing multiple facilities for the feedstock, bench-scale fermentation optimization, processing of algae biomass into algal oil, and refining of algal oil into diesel fuels. A detailed description of the design, facilities, installation and use of existing equipment, data analysis, schedule, capital purchases, and processes associated with the SzIBR can be found in Project Execution Plan. For purposes of the environmental questionnaire, the main components of the SzIBR are summarized below:

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Feedstock

The SzIBR project will use domestically-sourced sucrose as a transitional feedstock. During the later phases of the pilot-scale project, Solazyme intends to run several small batches of cellulosic sugars derived from switchgrass, wheat straw, corn stover and municipal green waste. An existing and fully permitted facility in York, Nebraska operated by Abengoa BioEnergy Corporation will convert switchgrass, wheat straw, and / or corn stover biomass to cellulosic sugars via enzymatic hydrolysis and deliver them to one of several locations associated with the project (discussed below). Additionally, an existing and fully permitted facility in Irvine, California operated by Blue Fire Ethanol will convert municipal green waste to cellulosic sugars via acid hydrolysis and deliver them to Solazyme.

R & D Laboratory Work

Solazyme will utilize feedstock supplies delivered to their preexisting and fully permitted laboratory facilities in South San Francisco, California to optimize fermentation processes during set up of the pilot-scale equipment. Work at this facility will only include ordinary, on-going laboratory activities and no algal oil refining will occur at this location.

Pilot Scale SzIBR

Solazyme will construct the pilot-scale SzIBR at the site of Cherokee Pharmaceuticals' (Cherokee) existing commercial chemical manufacturing and fermentation plant in Riverside, Pennsylvania. Cherokee has extensive spare fermentation capacity and the necessary supporting infrastructure, which will avoid the need for Solazyme to construct a new facility. No structural modifications will be required at Cherokee to accommodate the SzIBR and will only require the installation of skid mounted process equipment needed for EX 4 *Only relatively minor remodeling of the interior space will be required to install the equipment necessary for the SzIBR. The fermentation, drying, extraction, and algal oil purification process is described in detail in Section 2.2 of the Project Management Plan.*

Refining Algal Oil to Biodiesel and Renewable Diesel

The SzIBR project will utilize an existing biorefinery in order to transesterify the refined algal oil into ASTM D6751 standard biodiesel. Solazyme will transport a majority of the refined algal oil produced at Cherokee (200,000 gallons) to a transesterification refining facility operated by Renewable Energy Group (REG) in Iowa. The remaining 25,000 gallons of algal oil produced at Cherokee will be transported to a biodiesel refining facility operated by UOP near Houston, Texas, for conversion to renewable diesel.

2. Does any part of your project require review and/or permitting by any other federal, state, regional, local, environmental, or regulatory agency? If yes, please describe.

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Yes. Permit modifications required for the Project area are described by resource below:

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3. Has any review (e.g., NEPA documentation, permits, agency consultations) been completed? If yes, is a finding or report available and how can a copy be obtained?

   No NEPA documentation, permit applications, or agency consultations have been completed for the project.

4. Is the proposed project part of a larger scope of work? If yes, please describe.

   Yes. Solazyme anticipates upgrading and increasing throughput of the pilot-scale SzIBR in place, into a demonstration-scale SzIBR as part of an accelerated pathway to commercialization. The ultimate goal of the pilot-scale project is to demonstrate economic feasibility of the process for eventual commercialization.

   a. Do you anticipate requesting additional federal funding for subsequent phases of this project? If yes, please describe.

      At this time it is unclear if Solazyme will request additional federal funding for the demonstration-scale SzIBR. Funding sources for the demonstration-scale and commercial scale SzIBR are not currently defined.

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5. Does the scope of your project **only** involve one or more of the following:
   - Information gathering such as literature surveys, inventories, audits,
   - Data analysis including computer modeling,
   - Document preparation such as design, feasibility studies, analytical energy supply and demand studies, or
   - Information dissemination, including document mailings, publication, distribution, training, conferences, and informational programs.

   No, the project will involve activities beyond the scope of the activities listed above.

PART II: Environmental Considerations

Section A. Please indicate if any of the following conditions or special areas is present, required, or could be affected by your project. For each item listed below please indicate:

- Yes or No,
- The specific nature or type of activity or condition,
- Whether a consultation, approval, or permit applies and a description and status of the permitting/approval/documentation process.
- Where appropriate, please indicate if additional documentation is available.

1. Clearing or Excavation (indicate if greater than 1 acre)
   No. The project will not involve any ground disturbing activities (i.e. clearing or excavation). All construction and operation activities associated with the project will occur in existing structures.

2. Dredge and/or Fill. Specify the number of acres.
   No dredge or fill activities, which would potentially require U.S. Corps of Engineers Section 10, 401, and 404 permits, will be conducted for the project.

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4. Pre-Existing Contamination
   Solazyme is not aware of any pre-existing contamination at any of the facility locations associated with the project. No ground disturbing

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activities that could expose existing contamination will occur associated with the project.

5. Asbestos
   No asbestos will be produced, present, or disturbed by construction and operation of the project.

6. Criteria Pollutants

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   Potential criteria emissions are negligible compared to a commercial scale facility. Cherokee Pharmaceuticals staff will ensure that proper permit coverage either through exemption or permit is obtained. The SzIBR project will

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7. Non-Attainment Areas
   The Cherokee facility, in Riverside, Pennsylvania, is not located within in any area designated by the EPA for non-attainment of CO, NO2, Ozone (1-hour and 8-hour), SO2, PM 2.5, PM10, or Pb pollutants. The laboratory facility in South San Francisco is located in a non-attainment area for 8-hour Ozone. The project will generate a small amount of Ozone emissions in the non-attainment area associated with transportation of feedstock materials and algae to/from the Solazyme lab facility. These emission levels would be minor and would not significantly contribute to Ozone levels present in the San Francisco area.

8. Class I Air Quality Control Region
   The project facility locations are not located within or near any Class I Air Quality Control Regions.

9. Navigable Air Space
   The project will not be located in or interfere with any navigable air space.

10. Areas with Special Designation (e.g., National Forests, Parks, Trails)
    The project will not be located within or near any special designation areas including National Forests, National Parks, or trail systems.

11. Prime, Unique or Important Farmland
    The project will not disturb any prime, unique, or important farmland. The project will not involve any ground disturbing activities and will be located within existing facilities.

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12. Archeological/Cultural Resources
    No known archeological or cultural resources will be impacted by the project. No ground disturbing activities will occur. Additionally, the facility modifications and equipment installation will not occur in any structures listed as eligible or potentially eligible for listing on the National Register of Historic Places.

13. Threatened/Endangered Species and/or Critical Habitat
    No threatened or endangered species will be impacted by construction and operation of the project. No critical habitat will be impacted or modified as a result of the project. Development of the project will not involve any ground disturbing activities that would impact species or habitat.

14. Other Protected Species (Wild Burros, Migratory Birds)
    No other species will be impacted by construction and operation of the project. Development of the project will not involve any ground disturbing activities that would impact species or habitat. No structures or overhead transmission lines, which could lead to impacts on migratory birds, will be constructed in association with the project.

15. Floodplains
    Floodplains will not be impacted by the project. No buildings or other structures that could change surrounding floodplain elevations will be constructed in association with the SzIBR project.

16. Special Sources of Groundwater (e.g., Sole Source Aquifer)
    No groundwater will be used in association with the project. All water supplies for the project will come from municipal sources and/or permitted surface water intakes.

17. Underground Extraction/Injection (non-hazardous substances)
    No underground extraction or injection will occur during the course of the project.

18. Wetlands
    The project will not be located within or near any wetland areas. Additionally, no ground disturbing activities will occur as a result of the project.

19. Coastal Zones
    No coastal zone consistency determinations or associated permits will be required for the construction and operation of the project.

20. Public Issues or Concerns

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Solazyme has not identified any public issues or concerns associated with construction and operation of the proposed project. None are expected because the project will use existing facilities. The SzIBR project will be a very small operation amongst a large existing industrial operation. All newly installed equipment will be enclosed in an existing building. No outward impact can be observed.

21. Noise
    Noise above ambient conditions could be generated from the installation of process equipment at the Cherokee facility, but would be short term in nature and only occur during daylight hours. Operation of the fermenters at Cherokee would generate noise levels that necessitate the use of ear protection, but would not increase ambient noise levels due to current noise mitigation measures at the facility. Because noise will be short term and minimal, no permits, consultations, additional mitigation measures or approvals associated with noise will be required for construction and operation of the project.

22. Depletion of a Non-Renewable Resource
    Non-renewable resources that will be used in association with the project include diesel fuel used to transport the feedstocks and algal oil. Other non-renewable resources for the project include natural gas used to operate the burner associated with the dryer at Cherokee.

23. Aesthetics
    Construction and operation of the project will occur in existing structures, therefore no changes or negative impacts to aesthetics will occur.

24. Odor
    Odor generated from the project will be minimal and at levels below that which could be considered a nuisance outside of the facility boundaries.

Section B. Would your project use, disturb, or produce any chemicals or biological substances? (i.e., pesticides, industrial process, fuels, lubricants, bacteria) For each materials or processes listed below please indicate:

- Yes or No,
- Quantity,
- Whether a permit is required and if so what type of permit,
- Specific type, use, or condition,
- Where appropriate, please indicate if additional documentation is available.

1. Polychlorinated Biphenyls (PCBs)
   The proposed project would not use, disturb, or produce any Polychlorinated Biphenyls.

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2. Import, Manufacture, or Processing of Toxic Substances
   The SzIBR project will not import, manufacture, or process any toxic substances listed on the Toxic Substances Control Act of 1976. The transesterification of algal oil into biodiesel at the REG facilities will involve the use of methanol. The methanol is contained within a closed loop system for the refining process and only trace amounts are present in the glycerin byproduct. REG currently has small quantity hazardous waste permits to properly dispose of methanol. UOP will not import, manufacture, or process any toxic substances during the refining process.

3. Chemical Storage, Use, and Disposal

   Solazyme
   During laboratory activities very small amounts of chemicals for work supporting the SzIBR effort, including media nutrients, ammonia, and potassium hydroxide that will be stored, used, and disposed of at the Solazyme laboratory facility. Solazyme utilizes protocols outlined in their Laboratory Chemical Hygiene Plan and Hazardous Materials Business Plan to properly handle, store, and dispose of these chemicals.

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4. Pesticide Use
   The proposed project would not use, disturb, or produce any pesticides.

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5. Hazardous, Toxic, or Criteria Pollutant Air Emissions
   Emissions of Hazardous Air Pollutants (HAPs) or toxics not listed as HAPs will be negligible. SzIBR will not trigger new applicability of any NESHAP regulation or emit toxic air emissions of any concern.

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   Potential criteria emissions are negligible compared to a commercial scale facility. Cherokee Pharmaceuticals staff will ensure that proper permit coverage either through exemption or permit is obtained. The SzIBR project REDACTED EXEMPTION 4 *will involve new emission units but will emit at levels below the PSD Significant Emission Rates (SER).*

6. Liquid Effluent

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7. Underground Extraction/Injection (hazardous substances)
   The project will not involve underground extraction or injection of hazardous substances.

8. Hazardous Waste
   Based on the current regulations regarding hazardous waste (Title 10 CFR § 261.31-33) no materials used or produced by the SzIBR are classified as hazardous waste. The transesterification of algal oil into biodiesel at the facility will involve the use of methanol. The methanol is contained within a closed loop system for the refining process and only trace amounts are present in the glycerin byproduct. REG currently has a small quantity hazardous waste permits to properly dispose of methanol.

9. Underground Storage Tanks

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The project will not involve the use of any underground storage tanks.

10. Biological Materials. Indicate if genetically altered materials are involved.

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EXEMPTION 4

Section C. Would your project require or produce any radiological materials? For each item below, please indicate:

- Yes or No,
- Quantity,
- Whether a permit is required and if so what type,
- Specific nature of use,
- Where appropriate, please indicate if additional documentation is available.

1. Radioactive Mixed Waste
   The project will not require or produce any radioactive mixed waste.

2. Radioactive Waste
   The project will not require or produce any radioactive waste.

3. Radiation Exposures
   The project will not generate any radiation exposure.

Section D. The following questions are designed specifically to guide applicants who are doing laboratory/bench-scale projects or who will have laboratory work associated with their projects.

NEPA R&D Laboratory Questions

In order for a recipient to receive financial assistance, their project must be reviewed under the National Environmental Policy Act (NEPA) for potential environmental impacts. For research and development laboratory activities, the following questions must be sufficiently answered before the review can be completed. Please add as much detail as possible.

1. Please provide and describe the location of the facility or facilities where lab work will take place.

Laboratory activities, mainly consisting of algae fermentation optimization, will occur at the Solazyme facility located at 561 Eccles Avenue, South San Francisco, California, 94080.

Fermentation and algal oil refining activities will occur at the Cherokee facility, which is located at Avenue C, Riverside, Pennsylvania, 17868.

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2. What type of safety protocols are in place in the areas where work will take place? Who monitors these? Internally and externally? OSHA standards?

Solazyme

Solazyme is committed to protecting employee health and complying with all applicable laws and regulations. This is accomplished through the implementation of OSHA compliant safety policies and procedures. These policies and procedures include: A Hazardous Materials Business Plan compliant with the California Health and Safety Code, an Injury and Illness Prevention Program, a Laboratory Chemical Hygiene Plan as well as a Radiation Safety Program and License. These programs are monitored internally by Solazyme and externally by the California Department of Health. These plans include provisions to identify and prevent safety and health hazards, inspection protocols, safety training, communication and record keeping protocols, emergency action planning, fire prevention and planning, personal protective equipment use, and hazardous substance handling procedures.

Cherokee

Cherokee is committed to protecting employee health and complying with all applicable laws and regulations. This is accomplished through the implementation of OSHA compliant safety policies and procedures. These policies and procedures include: Hazardous Work Permits, Hazard Communication, Safety Incident Reporting & Investigation, Safety Shower/Eyewash Stations, Biosafety, Portable & Fixed Ladders, Aerial Lifts, Scaffolds, Job Safety Assessments, Internal Safety Assessments (Audits), Fixed Cranes, Hoists, & Rigging, Mobile Cranes, Contractor Safety Management, Personal Protective Equipment, Laboratory Spill Response, Fork Lift Trucks, Hearing Protection, Ventilation, Control of Hazardous Energy, Respiratory Protection, Process Safety Management, Electrical Safe Work Practices, Fall Protection, Ergonomics, and Emergency Evacuation. All affected employees are trained on the requirements of these procedures prior to starting work at the facility and again when changes are made and/or per the site's training schedule.

3. How are the gases, chemicals, heavy metals, etc...? handled, stored and disposed?

Solazyme

Solazyme utilizes protocols outlined in their Laboratory Chemical Hygiene Plan and Hazardous Materials Business Plan to properly handle, store, and dispose of gases, chemicals, and heavy metals. Specific protocols include monitoring use and disposal of chemicals used in the lab, conducting audits, correcting deficiencies, and maintain appropriate documentation of chemical use and disposal, identifying adequate protective measures, and conducting training for lab employees. Chemical fume hoods are used when working with volatile substances and fire extinguishers are available throughout the laboratory. Emergency eye wash stations and safety showers are available within a 10 second walk of any area of expected exposure. Solazyme has a stringent set of administrative and safety controls for the procurement, distribution, and storage of chemicals which are outlined in the Laboratory Chemical Hygiene Plan.

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Cherokee

The site has procedures to review every raw material, product, and/or byproduct used prior to it entering the site including gases, chemicals, and raw materials. Cherokee also conducts a detailed environmental review of new processes prior to implementation. Part of this review is to characterize (for disposal) any wastes and/or byproducts that will be generated by the process. Prior to disposal, a contracted laboratory is used to perform any testing requested by the disposal facility.

4. What type of safety equipment is in place for the facilities (i.e. fume hoods, alarms, scrubbers, etc...)?

Solazyme

Chemical flume hoods are used when working with volatile substances and fire extinguishers are available throughout the laboratory. Emergency eye wash stations and safety showers are available within a 10 second walk of any area of expected exposure. Personal protective equipment available at the laboratory includes safety glasses, protective gloves, safety shoes, and respiratory equipment. Other safety equipment on-site includes fire alarms, telephones for emergency use, respiratory protection and ventilation, and first-aid kits.

Cherokee

Cherokee Pharmaceuticals provides personal protective equipment to all employees, including but not limited to, safety glasses, steel-toed shoes, face shields, respiratory protection, hearing protection, and chemical resistant gloves and aprons. Protective equipment requirements are determined by the site safety department when new chemicals are brought on-site. Portable fire extinguishers and safety eyewash / showers are provided throughout the facility and all employees are trained on their use. Additionally, the site is equipped with automatic sprinkler protection and utilizes a Simplex fire alarm system. All fire protection systems are inspected and maintained per National Fire Protection Association (NFPA) and state Fire Marshall (FM) recommendations.

5. What permits are in place for the facility for this type of work? Please list.

Solazyme

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Cherokee

No operation permits, aside from the existing environmental permits listed in Part 1, Question 2 are required for the SzIBR project.

Abengoa, BlueFire, UOP, and REG

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All actors other than Cherokee and Solazyme are independently responsible for proper permit coverage of their activities. These are existing operations with existing permit coverage which the SzIBR will transact business with not extensions of the SzIBR pilot facility.

6. What permits are needed or will be acquired for this type of work? Please list.

Solazyme
No additional permits will be required to conduct work for the SzIBR project.

Cherokee
No additional permits will be required to conduct work for the SzIBR project.

Abengoa, BlueFire, UOP, and REG
All actors other than Cherokee and Solazyme are independently responsible for proper permit coverage of their activities. These are existing operations with existing permit coverage which the SzIBR will transact business with not extensions of the SzIBR pilot facility.

7. How is liquid effluent handled and discharged?

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EXEMPTION 4

8. How is toxic waste handled, stored, disposed?

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9. Will the work being done create any air pollutants? If so please explain how these are handled/disposed/mitigated.

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11. Will prototypes be tested in a separate location, if so, please describe the location and answer questions #1-9?
No prototypes will be tested in separate locations.

12. Are subcontractors being used for some of the work? If so please answer Questions #1-10 for work being completed by subcontractors.
No subcontractors will be used for any additional R & D lab work.

Solazyme's indirect rate is calculated based on the PMC 400.2 Sample Indirect Rate Proposal – Two Rate Method (Fringe and Indirect Rate).

Fringe rate justification:

____ **A fringe benefit rate has been negotiated with, or approved by, a federal government agency. A copy of the latest rate agreement is included with this application, and will be provided electronically to the Contracting Officer for this project.**
(When this option is selected, a presentation of the budget that demonstrates the appliction of the approved rate, to arrive at the proposed fringes benefits dollars should also be provided.)

__X__ **There is not a current, federally approved rate agreement negotiated and available.**
(When this option is checked, the entity preparing this form shall submit a rate proposal in the format provided at the following website, or a format that provides the same level of information and which will support the rates being proposed for use in performance of the proposed project. Go to https://www.eere-pmc.energy.gov/forms.aspx and select PMC 400.2 Sample Rate Proposal.)

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Indirect rate justification:

____ **There is a federally approved indirect rate agreement. A copy is provided with this application and will be provided electronically to the Contracting Officer for this project.**
(When this option is selected, a presentation of the budget that demonstrates the application of the approved rate, to arrive at the proposed indirect charges proposed should also be provided.)

__X__ **There is no current, federally-approved indirect rate agreement.**
(When this option is checked, the entity preparing this form shall submit an indirect cost rate proposal in the format provided at the following website, or in a format that provides the same level of information and which supports the rate(s) being proposed for use in estimating the project. Go to https://www.eere-pmc.energy.gov/forms.aspx and select PMC 400.2 Sample Rate Proposal.)

The Indirect pool includes all expenses and activities that are not directly assigned to a single activity or project that are required for the successful execution of these projects.

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____ **There is a federally approved indirect rate agreement. A copy is provided with this application and will be provided electronically to the Contracting Officer for this project.**
(When this option is selected, a presentation of the budget that demonstrates the application of the approved rate, to arrive at the proposed indirect charges proposed should also be provided.)

__X__ **There is no current, federally-approved indirect rate agreement.**
(When this option is checked, the entity preparing this form shall submit an indirect cost rate proposal in the format provided at the following website, or in a format that provides the same level of information and which supports the rate(s) being proposed for use in estimating the project. Go to https://www.eere-pmc.energy.gov/forms.aspx and select PMC 400.2 Sample Rate Proposal.)

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