

GRANTS/CONTINGENT AWARD REQUEST



To: Grants and Loans Office

Date: 3/15/2012

Project Manager: Paul Roggensack

Phone Number: 916-327-2224

Office: Energy Efficiency Research Office Division: Energy Research and Development MS- 51

Full-Scale Demonstration of an Innovative Electrodialysis Technology for Zero Liquid Discharge

Project Title: Desalination

Type of Request: (check one)

New Agreement: (include items A-F from below) Agreement Number: PIR-11-020

Program: PIER E / Industrial/ Ag/ Water

Solicitation Name and/or Number: PON-11-501-03 (2011 Emerging Technology Demonstration Grant Program (ETDG II))

Legal Name of Recipient: Black & Veatch

Recipient's Full Mailing Address: 8400 WARD PKWY
KANSAS CITY, MO 64114-2031

Recipient's Project Officer: Rick Bond Phone Number: 913-458-3143

Agreement Start Date: 6/29/2012 Agreement End Date: 3/31/2015

Amendment : (Check all that apply) Agreement Number: _____

Term Extension – New End Date: _____

Work Statement Revision (include Item A from below)

Budget Revision (include Item B from below)

Change of Scope (include Items A – F as applicable from below)

Other: _____

ITEMS TO ATTACH WITH REQUEST:

- A. Work Statement
- B. Budget
- C. Recipient Resolution, if applicable. (Resolution may be requested in Special Conditions if not currently available.)
- D. Special Conditions, if applicable.
- E. CEQA Compliance Form
- F. Other Documents as applicable
 - Copy of Score Sheets
 - Copy of Pre-Award Correspondence
 - Copy of All Other Relevant Documents

California Environmental Quality Act (CEQA)

CEC finds, based on recipient's documentation in compliance with CEQA:

Project exempt: _____ NOE filed: _____

Environmental Document prepared: _____ NOD filed: _____

Other: _____

CEC has made CEQA finding described in CEC-280, attached

Funding Information:

*Source #1: NG Amount: \$ 135,821.00 Statute: 10- FY: 11-12 Budget List #: 501.001E

*Source #2: PIER-E Amount: \$ 663,939.00 Statute: 10- FY: 11-12 Budget List #: 501.027I

*Source #3: _____ Amount: \$ _____ Statute: _____ FY: _____ Budget List #: _____

If federally funded, specify federal agreement number: _____

* Source Examples include ERPA, PIER-E, PIER-NG, FED, GRDA, ARFVT, OTHER.

Business Meeting Approval: (refer to Business Meeting Schedule)

Proposed Business Meeting Date: 5/9/2012 Consent Discussion

Business Meeting Participant: Paul Roggensack Time Needed: 5 minutes

Agenda Notice Statement: (state purpose in layperson terms)

Possible approval of a Grant / Contingent Award to...

Possible approval of Agreement PIR-11-020 for a grant of \$799,760.00 with Black & Veatch to demonstrate technology for desalinating wastewater and power plant cooling water which recovers water, produces no salty liquid discharge, and reduces energy consumption and operating cost. (PIER electricity and natural gas funding.) Contact: Paul Roggensack. (5 minutes)

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TASK LIST

Task #	CPR	Task Name
1	N/A	Administration
2		Coordination with Utility Sponsors and Measurement and Verification Contractor
3		Literature Review
4	X	Demonstration Testing
5	X	Project Measurement and Verification
6	N/A	Technology Transfer Activities
7	N/A	Production Readiness Plan

KEY NAME LIST

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
1-7	Rick Bond (Black & Veatch)		

GLOSSARY

Specific terms and acronyms used throughout this work statement are defined as follows:

Term/Acronym	Definition
BHDF	Beverly Hills Desalination Facility
CPR	Critical Project Review
CPM	Commission Project Manager
ED	Electrodialysis
EDM	Electrodialysis Metathesis
IOU	Investor Owned Utility
PIER	Public Interest Energy Research
RD&D	Research, Development and Demonstration
ZLD	Zero Liquid Discharge

Problem Statement:

The purpose of this research project is to demonstrate an emerging technology, Electrodialysis Metathesis (EDM), for treatment of desalination waste concentrate, reclaimed wastewater, industrial wastewater, and power plant cooling water. The technology will be tested with a full-scale EDM stack treating desalination waste concentrate at the Beverly Hills Desalination Facility (BHDF), which treats brackish groundwater for potable use.

The objectives of the demonstration will be to determine the energy requirements, water recovery, required ion exchange membrane area, and effluent water quality. The brine concentrate waste from BHDF is currently discharged to the sewer. The city of Beverly Hills desires to develop a Zero Liquid Discharge (ZLD) desalination alternative to conserve water and avoid sewer discharge of brine waste concentrate, which will potentially decrease any adverse impacts to the environment of the BHDF. The results

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from this study can be used by other desalination facilities and by power plants to evaluate treatment of concentrate and power plant cooling water.

The greatest obstacle to putting the technology into practice into California is lack of consumer knowledge and exposure of the technology to a wide audience of water and power utilities. Demonstration of the technology, publication of a research report, and technology transfer through conference presentations and journal publications will move the technology beyond the knowledge and exposure barrier. This barrier has not been addressed in the past because there has not been a similar opportunity to demonstrate the technology in California.

The key technological challenge will be sequential separation of salts in the EDM concentrate to develop salt products and end with a relatively pure sodium concentrate stream that can be reused in the EDM process. This challenge, however, is associated with the environmental sustainability of any ZLD method rather than the cost and energy savings provided by the EDM approach. EDM provides significant energy and cost reductions without beneficial reuse salts.

Goals of the Agreement:

The goal of this agreement is to demonstrate the capacity of EDM to reduce the energy required to perform ZLD desalination in water treatment, water reclamation, and power plant applications.

Objectives of the Agreement:

The objectives of this agreement are as follows:

- Determine the energy requirements for EDM treating reverse osmosis concentrate from a host site during full-scale demonstration.
- Using full-scale test results, quantify the energy reduction achievable using EDM for zero liquid discharge desalination at the host site.
- Use the results to conduct paper studies to quantify the energy reduction achievable using EDM for zero liquid discharge desalination at three to five other facilities that include drinking water treatment, water reclamation, and power plant cooling water facilities.
- Determine the salt products that can be produced from EDM concentrate.
- Determine the treatment options for developing salt products from EDM concentrate that minimize energy requirements and waste products.
- Develop a model with costs and design criteria for inland desalination that reduces energy requirements and minimizes or eliminates waste products for each water source evaluated.

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TASK 1 ADMINISTRATION

Task 1.1 Attend Kick-off Meeting

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

The Recipient shall:

- Attend a “Kick-Off” meeting with the Commission Project Manager, the Grants Officer, and a representative of the Accounting Office. The Recipient shall bring its Project Manager, Agreement Administrator, Accounting Officer, and others designated by the Commission Project Manager to this meeting. The administrative and technical aspects of this Agreement will be discussed at the meeting. Prior to the kick-off meeting, the Commission Project Manager will provide an agenda to all potential meeting participants.

The administrative portion of the meeting shall include, but not be limited to, the following:

- Discussion of the terms and conditions of the Agreement
- Discussion of Critical Project Review (Task 1.2)
- Match fund documentation (Task 1.6)
- Permit documentation (Task 1.7)

The technical portion of the meeting shall include, but not be limited to, the following:

- The Commission Project Manager’s expectations for accomplishing tasks described in the Scope of Work
- An updated Schedule of Products
- Discussion of Progress Reports (Task 1.4)
- Discussion of Technical Products (Product Guidelines located in Section 5 of the Terms and Conditions)
- Discussion of the Final Report (Task 1.5)

The Commission Project Manager shall:

- Designate the date and location of this meeting.

Recipient Products:

- Updated Schedule of Products (no draft)
- Updated List of Match Funds (no draft)
- Updated List of Permits (no draft)

Commission Project Manager Product:

- Kick-Off Meeting Agenda (no draft)

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Task 1.2 Critical Project Review (CPR) Meetings

The goal of this task is to determine if the project should continue to receive Energy Commission funding to complete this Agreement and to identify any needed modifications to the tasks, products, schedule or budget.

CPRs provide the opportunity for frank discussions between the Energy Commission and the Recipient. CPRs generally take place at key, predetermined points in the Agreement, as determined by the Commission Project Manager and as shown in the Technical Task List above. However, the Commission Project Manager may schedule additional CPRs as necessary, and any additional costs will be borne by the Recipient.

Participants include the Commission Project Manager and the Recipient and may include the Commission Grants Officer, the Public Interest Energy Research (PIER) Program Team Lead, other Energy Commission staff and Management as well as other individuals selected by the Commission Project Manager to provide support to the Energy Commission.

The Commission Project Manager shall:

- Determine the location, date, and time of each CPR meeting with the Recipient. These meetings generally take place at the Energy Commission, but they may take place at another location.
 - Send the Recipient the agenda and a list of expected participants in advance of each CPR. If applicable, the agenda shall include a discussion on both match funding and permits.
 - Conduct and make a record of each CPR meeting. One of the outcomes of this meeting will be a schedule for providing the written determination described below.
 - Determine whether to continue the project, and if continuing, whether or not modifications are needed to the tasks, schedule, products, and/or budget for the remainder of the Agreement. Modifications to the Agreement may require a formal amendment (please see the Terms and Conditions).
 - Provide the Recipient with a written determination in accordance with the schedule. The written response may include a requirement for the Recipient to revise one or more product(s) that were included in the CPR.

The Recipient shall:

- Prepare a CPR Report for each CPR that discusses the progress of the Agreement toward achieving its goals and objectives. This report shall include recommendations and conclusions regarding continued work of the projects. This report shall be submitted along with any other products identified in this scope of work. The Recipient shall submit these documents to the Commission Project Manager and any other designated reviewers at least 15 working days in advance of each CPR meeting.

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- Present the required information at each CPR meeting and participate in a discussion about the Agreement.

Commission Project Manager Products:

- Agenda and a list of expected participants (no draft)
- Schedule for written determination (no draft)
- Written determination (no draft)

Recipient Product:

- CPR Report(s) (no draft)

Task 1.3 Final Meeting

The goal of this task is to closeout this Agreement.

The Recipient shall:

- Meet with Energy Commission staff to present the findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement.

This meeting will be attended by, at a minimum, the Recipient, the Commission Grants Office Officer, and the Commission Project Manager. The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be two separate meetings at the discretion of the Commission Project Manager.

The technical portion of the meeting shall present an assessment of the degree to which project and task goals and objectives were achieved, findings, conclusions, recommended next steps (if any) for the Agreement, and recommendations for improvements. The Commission Project Manager will determine the appropriate meeting participants.

The administrative portion of the meeting shall be a discussion with the Commission Project Manager and the Grants Officer about the following Agreement closeout items:

- What to do with any equipment purchased with Energy Commission funds (Options)
- Energy Commission's request for specific "generated" data (not already provided in Agreement products)
- Need to document Recipient's disclosure of "subject inventions" developed under the Agreement
- "Surviving" Agreement provisions, such as repayment provisions and confidential Products
- Final invoicing and release of retention
- Prepare a schedule for completing the closeout activities for this

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Agreement

Products:

- Written documentation of meeting agreements (no draft)
- Schedule for completing closeout activities (no draft)

Task 1.4 Monthly Progress Reports

The goal of this task is to periodically verify that satisfactory and continued progress is made towards achieving the research objectives of this Agreement on time and within budget.

The objectives of this task are to summarize activities performed during the reporting period, to identify activities planned for the next reporting period, to identify issues that may affect performance and expenditures, and to form the basis for determining whether invoices are consistent with work performed.

The Recipient shall:

- Prepare a Monthly Progress Report which summarizes all Agreement activities conducted by the Recipient for the reporting period, including an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. Each progress report is due to the Commission Project Manager within 10 days of the end of the reporting period. The recommended specifications for each progress report are contained in Exhibit A, Attachment A-2.

Product:

- Monthly Progress Reports (no draft)

Task 1.5 Final Report

The goal of the Final Report is to assess the project's success in achieving its goals and objectives, advancing science and technology, and providing energy-related and other benefits to California.

The objectives of the Final Report are to clearly and completely describe the project's purpose, approach, activities performed, results, and advancements in science and technology; to present a public assessment of the success of the project as measured by the degree to which goals and objectives were achieved; to make insightful observations based on results obtained; to draw conclusions; and to make recommendations for further RD&D projects and improvements to the PIER project management processes.

The Final Report shall be a public document. If the Recipient has obtained confidential status from the Energy Commission and will be preparing a confidential version of the Final Report as well, the Recipient shall perform the following activities for both the

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public and confidential versions of the Final Report.

The Recipient shall:

- Prepare an Outline of the Final Report.
- Prepare a Final Report following the approved outline and the latest version of the PIER Final Report guidelines published on the Energy Commission's website at <http://www.energy.ca.gov/contracts/pier/contractors/index.html> at the time the Recipient begins performing this task, unless otherwise instructed in writing by the Commission Project Manager. Instead of the timeframe listed in the Product Guidelines located in Section 5 of the Terms and Conditions, the Commission Project Manager shall provide written comments on the Draft Final Report within fifteen (15) working days of receipt. The Final Report must be completed on or before the end of the Agreement Term.
- Submit one bound copy of the Final Report with the final invoice.

Products:

- Draft Outline of the Final Report
- Final Outline of the Final Report
- Draft Final Report
- Final Report

Task 1.6 Identify and Obtain Matching Funds

The goal of this task is to ensure that the match funds planned for this Agreement are obtained for and applied to this Agreement during the term of this Agreement.

The costs to obtain and document match fund commitments are not reimbursable through this Agreement. Although the PIER budget for this task will be zero dollars, the Recipient may utilize match funds for this task. Match funds shall be spent concurrently or in advance of PIER funds for each task during the term of this Agreement. Match funds must be identified in writing and the associated commitments obtained before the Recipient can incur any costs for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a letter documenting the match funding committed to this Agreement and submit it to the Commission Project Manager at least 2 working days prior to the kick-off meeting. 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 such 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 each cash match fund, its source, including a

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- contact name, address and telephone number and the task(s) to which the match funds will be applied
- Amount of each in-kind contribution, a description, documented market or book value, and its 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 shall identify its owner and provide a contact name, address and telephone number, and the address where the property is located
- Provide a copy of the letter of commitment from an authorized representative of each source of cash match funding or in-kind contributions that these funds or contributions have been secured.
- Discuss match funds and the implications to the Agreement if they are reduced or not obtained as committed, at the kick-off meeting. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide the appropriate information to the Commission Project Manager if during the course of the Agreement additional match funds are received.
- Notify the Commission Project Manager within 10 days if during the course of the Agreement existing match funds are reduced. Reduction in match funds must be approved through a formal amendment to the Agreement and may trigger an additional CPR.

Products:

- A letter regarding match funds or stating that no match funds are provided (no draft)
- Copy(ies) of each match fund commitment letter(s) (if applicable) (no draft)
- Letter(s) for new match funds (if applicable) (no draft)
- Letter that match funds were reduced (if applicable) (no draft)

Task 1.7 Identify and Obtain Required Permits

The goal of this task 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. Although the PIER budget for this task will be zero dollars, the Recipient shall budget match funds for any expected expenditures associated with obtaining permits. Permits must be identified in writing and obtained before the Recipient can make any expenditures for which a permit is required.

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The Recipient shall:

- Prepare a letter documenting the permits required to conduct this Agreement and submit it to the Commission Project Manager at least 2 working days prior to the kick-off meeting. If there are no permits required at the start of this Agreement, then state such in the letter. If it is known at the beginning of the Agreement that permits will be required during the course of the Agreement, provide in the letter:
 - A list of the permits that identifies the:
 - Type of permit
 - Name, address and telephone number of the permitting jurisdictions or lead agencies
- The schedule the Recipient will follow in applying for and obtaining these permits.
- Discuss the list of permits and the schedule for obtaining them at the kick-off meeting and develop a timetable for submitting the updated list, schedule and the copies of the permits. The implications to the Agreement 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 the Progress Reports and will be a topic at CPR meetings.
- If during the course of the Agreement additional permits become necessary, provide the appropriate information on each permit and an updated schedule to the Commission Project Manager.
- As permits are obtained, send a copy of each approved permit to the Commission Project Manager.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the Commission Project Manager within 10 days. Either of these events may trigger an additional CPR.

Products:

- Letter documenting the permits or stating that no permits are required (no draft)
- A copy of each approved permit (if applicable) (no draft)
- Updated list of permits as they change during the term of the Agreement (if applicable) (no draft)
- Updated schedule for acquiring permits as changes occur during the term of the Agreement (if applicable) (no draft)

TECHNICAL TASKS

The Recipient shall prepare all deliverables in accordance with the requirements in Task 1.5. Products not requiring a draft version are indicated by marking “no draft” after the product name.

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TASK 2 COORDINATION WITH UTILITY SPONSORS AND MEASUREMENT AND VERIFICATION CONTRACTOR

The goal of this task is to coordinate with utility sponsors and a measurement and verification contractor to implement the project.

Task 2.1 Verify that the Proposed Demonstration Site Can Host the Project

The goal of this task is to identify and confirm the demonstration site and sponsor.

The Recipient shall:

- Prepare and provide a letter to the CPM that identifies and confirms the demonstration site and sponsor, and outlines the steps necessary to mobilize the project.
- Provide a letter from the demonstration site sponsor confirming its participation.
- If the proposed demonstration site and sponsor are not available, identify an alternate demonstration site and sponsor of appropriate type and scale.

Products:

- A letter to the CPM that identifies and confirms the demonstration site and sponsor and outlines the steps necessary to mobilize the project (no draft)
- A letter from the demonstration site sponsor confirming its participation (no draft)

Task 2.2 Confirm the Measurement and Verification Contractor

The goals of this task are to identify and confirm a third party measurement and verification contractor.

The Recipient shall:

- Prepare and provide a letter to the CPM that identifies and confirms a measurement and verification contractor for the project.

Products:

- Letter to the CPM that identifies and confirms the third-party measurement and verification contractor for the project (no draft)

TASK 3 LITERATURE REVIEW

The goal of this task is to review literature to establish the current state of the technology tested in this project.

The Recipient shall:

- Review peer-reviewed journals to determine the current knowledge base relevant to the technologies tested in this project.
- Report findings of the literature review in a Literature Review Summary.

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Products:

- Literature Review Summary (to be incorporated into the Final Report In accordance with Task 1.5) (no draft)

TASK 4 DEMONSTRATION TESTING

The goal of this task is to conduct a full-scale test of EDM to treat concentrate from the Beverly Hills Desalination Facility.

Task 4.1 Develop Testing Plan

The goal of this task is to develop a Testing Plan for the project.

The Recipient shall:

- Develop a Testing Plan that will serve as a blueprint for conducting demonstration testing. The plan will include a schedule for testing activities, and will provide a detailed description of experiments to be conducted, data collection, and water quality monitoring.

Products:

- Testing Plan (no draft)

Task 4.2 Site Mobilization and Equipment Installation Plan

The goal of this task is to develop a Site Mobilization and Equipment Installation Plan.

The Recipient shall:

- Develop a Mobilization and Equipment Installation Plan for layout of equipment at the site that describes plumbing and electrical connections.
- Coordinate with a subcontractor (Veolia Engineers) and the city of Beverly Hills for shipment and receipt of equipment.
- Coordinate with Veolia Engineers and the city of Beverly Hills for installation of equipment at the site.

Products:

- Mobilization and Equipment Installation Plan (no draft)

Task 4.3 Preliminary Modeling to Estimate EDM Operating Parameters

The goal of this task is to set preliminary modeling and EDM operating parameters for the project to evaluate technology approaches and formation of salt products from EDM concentrate.

The Recipient shall:

- Set treatment goals for EDM treating the concentrate based on city of Beverly Hills water quality goals.
- Perform modeling calculations using an EDM model developed by the Recipient.
- Estimate energy requirements.

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- Estimate EDM-finished water and concentrate water quality.
- Estimate mass balances for solids and water to achieve zero liquid discharge.
- Evaluate treatment processes for developing salt products from EDM concentrate.
- Estimate the mass of each salt product formed.
- Estimate mass balance on sodium chloride that includes sodium chloride recycled from EDM concentrate back to the EDM process.
- Prepare an EDM Operating Parameters Report.
- Prepare Critical Project Review Report #1.
- Participate in a Critical Project Review.

Products:

- EDM Operating Parameters Report (no draft)
- Critical Project Review Report #1(no draft)

Task 4.4 Conduct Demonstration Testing

The goal of this task is to monitor and collect data on the performance of the technology at the demonstration site.

The Recipient shall:

- Follow the Test Plan (Task 4.1) to conduct demonstration testing of the full-scale EDM stack treating concentrate.
- Monitor and record EDM operational parameter data as prescribed in the Test Plan (Task 4.1).
- Coordinate with Veolia Engineers and the city of Beverly Hills on the operation of the EDM stack and operating results.

Products:

- Operating performance data (to be included in the Final Report in accordance with Task 1.5)

Task 4.5 Water Quality Monitoring

The goal of this task is to collect water quality data.

The Recipient shall:

- Collect water quality samples for field and laboratory analyses according to the Test Plan schedule.
- Verify the performance of the technology in separating concentrate into two streams of highly soluble salts.
- Characterize each concentrate stream to evaluate the development of salt products from the concentrate.
- Verify that product water quality goals are met.
- Maintain a database for all water quality results.

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Products:

- Water quality data (to be included in the Final Report in accordance with Task 1.5)

TASK 5 PROJECT MEASUREMENT AND VERIFICATION

The goals of this task are to ensure measurement and verification of the study results by the measurement and verification contractor, and to demobilize the project.

Task 5.1 Develop Measurement and Verification Plan

The goal of this task is to develop a Measurement and Verification Plan.

The Recipient shall:

- Coordinate with the Energy Commission, the measurement and verification contractor, and Veolia Engineers to define key metrics for measurement and verification.
- Coordinate with the Energy Commission and the measurement and verification contractor to develop a schedule for measurement and verification.
- Use the results of Tasks 3 and 4 to prepare a Measurement and Verification Plan.
- Prepare the Critical Project Review Report #2.
- Participate in a Critical Project Review.

Products:

- Measurement and Verification Plan (no draft)
- Critical Project Review Report #2 (no draft)

Task 5.2 Conduct Measurement and Verification

The goal of this task is conduct measurement and verification for the technology demonstration.

The Recipient shall:

- Coordinate with the measurement and verification contractor to schedule all measurement and verification activities. Some of these activities will be site visits and some will involve review of data transferred electronically.
- Notify the Energy Commission and Veolia Engineers prior to measurement and verification site visits, and invite them to attend and participate in the visits.
- Obtain a report from the measurement and verification contractor describing the findings from this task.
- Include a discussion of measurement and verification activities in the Final Report.

Products:

- A discussion of Third-party Measurement and Verification activities and

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data (to be included in the Final Report in accordance with Task 1.5)

Task 5.3 Demobilization of Equipment at the Site

The goal of this task is to demobilize the demonstration site.

The Recipient shall:

- Coordinate with Veolia Engineers and the city of Beverly Hills for disconnection of all equipment at the site.
- Coordinate with Veolia Engineers and the city of Beverly Hills for shipment of equipment.
- Prepare a Summary of the Demobilization of Equipment at the Site.

Products:

- A Summary of the Demobilization of Equipment at the Site (to be included in the Final Report in accordance with Task 1.5)

TASK 6 TECHNOLOGY TRANSFER ACTIVITIES

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

The Recipient shall:

- Give presentations at state and national conferences during and at the conclusion of the project to report study results.
- Submit manuscripts for publication in peer reviewed journals.
- Prepare a Technology Transfer Plan.

Products:

- Technology Transfer Plan

TASK 7 PRODUCTION READINESS PLAN

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

The Recipient shall:

- Coordinate with Veolia Engineers to 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 its state of development. The plan shall include, as appropriate, but not be limited to:
 - Identification of critical production processes, equipment, facilities, personnel resources, and support systems that will be needed to produce a commercially viable product.
 - A discussion of internal manufacturing facilities, as well as supplier technologies, capacity constraints imposed by the design under

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consideration, design elements identified as critical, and the use of hazardous or non-recyclable materials. The product manufacturing effort may include “proof of production processes”.

- A projected “should cost” for the product when in production.
- The expected investment threshold to launch the commercial product.
- An implementation plan to ramp up to full production.

Products:

- Production Readiness Plan