STATE OF CALIFORNIA

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 12/2019)

CALIFORNIA ENERGY COMMISSION

A) **New Agreement** # EPC-20-019 (to be completed by CGL office)

B) Division	Agreement Manager:	MS-	Phone
ERDD	Dustin Davis	51	916-776-0748

C) Recipient's Legal Name	Federal ID Number
Polaris Energy Services Inc.	46-5226519

D) Title of Project
Accelerated Deployment of Irrigation Pumping Demand Flexibility

E) Term and Amount

Start Date	End Date	Amount
4/30/2021	3/29/2024	$ 2,884,912

F) Business Meeting Information

☐ ARFVTP agreements $75K and under delegated to Executive Director

Proposed Business Meeting Date 4/14/2021 ☐ Consent ☒ Discussion

Business Meeting Presenter Dustin Davis Time Needed: 5 minutes

Please select one list serve. EPIC (Electric Program Investment Charge)

Agenda Item Subject and Description:

POLARIS ENERGY SERVICES INC. Proposed resolution approving Agreement EPC-20-019 with Polaris Energy Services, Inc. for a $2,884,912 grant to increase agricultural demand flexibility and adopting staff's determination that this action is exempt from CEQA. This project will deploy enhanced automated irrigation pump controls to enable demand flexibility at agricultural sites in the Central Valley of California.(EPIC funding) Contact: Dustin Davis (Staff Presentation: 5 minutes).

G) California Environmental Quality Act (CEQA) Compliance

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

   ☒ Yes (skip to question 2)

   ☐ No (complete the following (PRC 21065 and 14 CCR 15378)):

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

   a) ☒ Agreement **IS** exempt.

   ☐ Statutory Exemption. List PRC and/or CCR section number:

   ☒ Categorical Exemption. List CCR section number:
   Cal. Code Regs., tit. 14, § 15303 ; Cal. Code Regs., tit. 14, § 15306

   ☐ Common Sense Exemption. 14 CCR 15061 (b) (3)

Explain reason why Agreement is exempt under the above section:
Cal. Code Regs., tit.14, sec. 15303 provides that projects which consist of the installation of small new equipment and facilities in small structures are exempt from environmental review under the California Environmental Quality Act. This project will install controls on hundreds of existing agricultural irrigation pumps located on farms in the central valley of California. The controls are a dedicated piece of equipment that will be mounted to the existing irrigation pump control panels. The equipment is very small, 9 inches by 7 inches, and doesn't require any construction activities like trenching or the use of heavy equipment to install. Therefore, the project is categorically exempt from CEQA under section 15303.

Cal. Code Regs., tit. 14, sec. 15306 provides that projects which consist of basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource. In this project, electricity consumption and operational data will be collected from the controls and stored on personal computers. During energy-reduction events, the recipient will reduce electricity usage as controlled by these devices. Therefore, the project will not have a significant effect on the environment and falls within section 15306.

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

H) List all subcontractors (major and minor) and equipment vendors: (attach additional sheets as necessary)

Legal Company Name:	**Budget**
	$

I) List all key partners: (attach additional sheets as necessary)

Legal Company Name:

J) Budget Information

Funding Source	Funding Year of Appropriation	Budget List Number	Amount
EPIC	19-20	301.001G	$2,884,912

R&D Program Area: EERO: IAW TOTAL: $ 2,884,912

Explanation for "Other" selection

Reimbursement Contract #: Federal Agreement #:

K) Recipient's Contact Information

1. Recipient's Administrator/Officer

Name: David Meyers

Address: 411 Woodbridge St

City, State, Zip: San Luis Obispo, CA 93401-5514

Phone: (415) 722-2261

E-Mail: dmeyers@polarisenergyservices.com

2. Recipient's Project Manager

Name: David Meyers

Address: 411 Woodbridge St

City, State, Zip: San Luis Obispo, CA 93401-5514

Phone: (415) 722-2261

E-Mail: dmeyers@polarisenergyservices.com

L) Selection Process Used

☐ Competitive Solicitation Solicitation #:

☐ First Come First Served Solicitation Solicitation #:

☒ Follow-on Funding (SB 115)

M) The following items should be attached to this GRF

1.	Exhibit A, Scope of Work		☒ Attached
2.	Exhibit B, Budget Detail		☒ Attached
3.	CEC 105, Questionnaire for Identifying Conflicts		☒ Attached
4.	Recipient Resolution	☒ N/A	☐ Attached
5.	CEQA Documentation	☐ N/A	☒ Attached

Agreement Manager **Date**

Office Manager **Date**

Deputy Director **Date**

Exhibit A
Scope of Work
Polaris Energy Services

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR[1]	Task Name
1		General Project Tasks
2	x	Recruit Participating Sites
3		Deploy Hardware and Commission Automation Systems
4		Training, Operation, and Ongoing Support of Customer Systems
5		Software Product Development
6		Hardware Product Development
7		Evaluation of Project Benefits
8		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
AEU	Agricultural Energy Users
API	Application Programming Interfaces
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEC	California Energy Commission
CPR	Critical Project Review
DR	Demand Response
MW	Megawatts
PLUM	Peak Load Under Management
Recipient	Polaris Energy Services Inc.
TAC	Technical Advisory Committee
TOU	Time of Use

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

A. Purpose of Agreement

The purpose of this Agreement is to fund the addition of agricultural demand response (DR) capacity and to facilitate load shift from agricultural energy users (AEU) through technology deployment of automation systems that enable AEU to respond to curtailment and price signals from existing and emerging grid management systems.

B. Problem/ Solution Statement

<u>Problem</u>
California has committed to sourcing 100% of electricity from renewable resources by 2045 and 100% light-duty ZEV sales by 2035 and delivering it reliably, while maintaining DR and energy

[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.

efficiency at the top of the loading order. These goals require reliably shifting load from peak hours while increasing total supply of electricity and shedding load during emergency conditions. Irrigation pumping load can contribute a significant share of the required shift and shed resources but market, regulatory, technical and process obstacles have limited the sector's contribution to date.

The Recipients' EPIC application in 2016 noted that the duck curve ramp "has happened faster than anyone predicted and will only get steeper in the coming years" and that California's efforts to respond by moving toward real time pricing would "put agriculture growers in a position where they don't have the control, tools, understanding, and visibility needed to participate in this market."

The events of August 2020 were a manifestation of the problem statement but the response to it was the inverse of what was stated at the time; through EPC-16-045, the Recipient developed the tools needed by growers—and proved the ability to deliver load flexibility under the right conditions—but the markets had not evolved sufficiently to provide the resources needed by the grid.

While real time pricing is still in development, time of use (TOU) rates that shift peak windows to address the duck curve will be mandatory starting in 2021, and regulators are working to address market gaps and distortions in demand response. These, combined with release of Recipients' pump automation system and accelerating adoption of generic automation for irrigation, provide an opportunity to embed energy price response and DR capabilities in the first generation of control systems deployed in the agricultural sector.

Creating urgency and incentivizing AEU to incorporate energy management are needed to take advantage of these opportunities and scaling commercialization, deployment and support activities are required to achieve the desired impact. Selling and deploying systems is the first hurdle but EPC-16-045 demonstrated that achieving significant load shift requires ongoing engagement and customer support.

Solution

The project will deploy, enhance, customize, refine, and integrate Recipients' and third-party devices, software and interfaces to manage and control irrigation pumps and systems in response to pricing and event signals from California utilities and grid operators.

This project will facilitate market adoption of the Recipients' technology to manage load under the existing TOU tariffs and DR programs and expansion of the platform to connect agricultural pumping to emerging market paradigms such as the Price Portal envisioned by the emerging California Energy Commission (CEC) Load Management Standards. The project will provide enabling controls technology to energy users who can respond to TOU price signals but, because of the current market structure are ineligible for AutoDR and DR incentives when they do so.

The technical solution will expand the myPOLARIS application to provide energy financial management for users across heterogeneous (on different rates and tariffs) portfolios of utility service points. It will expand decision support for price responsive scheduling to include demand charges, which were not addressed in EPC-16-045 and are much more complex to address prospectively but are critical to energy users' decisions. It will also add intelligent scheduling recommendations to myPOLARIS, automatically generating irrigation schedules based on user preferences and constraints.

The project will implement hardware enhancements to maximize the applicability of the system to customers' irrigation system configurations. The enhancements will be driven by customer requirements and leverage the inherent flexibility of the pump automation controller to develop software that supports novel hardware configurations. For example, participant feedback in EPC-16-045 indicated that extending the intervals between refilling pump oil tanks and providing visibility into tank levels would enable more automated operation, so that upgrade will be included.

The market solution facet of the project will expand, identify and exploit program and price response opportunities for AEU. Expansion includes formal participation in proceedings and working groups and informal collaboration to make it easier and more attractive for AEU to provide demand flexibility. Identification and exploitation include analyzing all incentive, program and tariff opportunities for each participating AEU and leveraging those funds in addition to this funding to maximize the megawatts under management as a result of the project.

C. Goals and Objectives of the Agreement

Agreement Goals
The goal of this Agreement is to ramp up adoption of load management technology by the agricultural sector while bridging the gap between current and emerging load management standards. To do this, the Recipient will aim to add hundreds of sites to its network that do not participate in DR today or participate in DR but can benefit from—and contribute load shift under—new TOU rates.

Ratepayer Benefits:[2] This Agreement will result in the ratepayer benefits of greater electricity reliability, lower costs, and reduced carbon emissions.

Agricultural ratepayers will benefit by unlocking latent operational flexibility and trading it for lower energy costs, demand response payments and equipment incentives while enjoying operational benefits. All ratepayers will benefit from turning large, static loads into flexible resources that reduce the carbon intensity of electricity generation and enhance reliability, particularly by reducing peak net demand. The project will also prepare this large flexible resource for whatever dynamic load management standards emerge during and after the project, reducing the time to engage participants and increasing their response to price signals.

Technological Advancement and Breakthroughs:[3] This Agreement will lead to technological advancement and breakthroughs to overcome barriers to the achievement of the State of California's statutory energy goals by enabling AEU to respond to energy price signals as they

[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).

manage their irrigation. For the first time, a farmer will be able to enter irrigation requirements and operational constraints, receive a recommended irrigation plan, customize it and deploy it directly to an irrigation controller.

Participating Load in DR Programs and TOU Responsive Shift: This agreement will lead to 25 - 40 megawatts (MW) of peak load enrollment in DR programs and/or responding to TOU price signals using automation technology deployed following the 2020 season and before the end of the project.

Agreement Objectives

The objectives of this Agreement are to:

- Recruit AEU to participate in demand response programs and markets and/or to shift load in response to TOU and other price signals.
- Deploy the Pump Automation System for AEU to generate, compare, customize and implement irrigation schedules remotely.
- Employ the system to participate in DR programs and/or to deliver load shift from the afternoon ramp during regular operations.
- Drive adoption of the myPOLARIS mobile and web application to facilitate informed energy management by agricultural customers.
- Implement new tariffs and price signals that become available during the term of the project.
- Design and implement hardware configurations to control irrigation system components required for full automation.
- Demonstrate load shed and/or shift from 25-40 MW of Peak Load Under Management (PLUM). In the case of load shed, the megawatts managed will be enrolled, nominated and measured according to the rules of each individual program, which will generally derate the peak load by a factor unique to each service point and program. In the case of load shift, the megawatts managed will be shifted out of peak hours as defined by the applicable tariff for each service point, with a goal of shifting two thirds of usage (kilowatt hours) from those periods compared to prior years.

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).** All products submitted which will be viewed by the public, must comply with the accessibility requirements of Section 508 of the federal Rehabilitation Act of 1973, as amended (29 U.S.C. Sec. 794d), and regulations implementing that act as set forth in Part 1194 of Title 36 of the Federal Code of Regulations**.** All technical tasks should include product(s). 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.

The Recipient shall:

<u>For products that require a draft version, including the Final Report Outline and Final Report</u>

- 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.

<u>For products that require a final version only</u>

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

<u>For all products</u>

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

<u>Instructions for Submitting Electronic Files and Developing Software</u>:

- **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 California Energy Commission's (CEC) 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.

The following describes the accepted formats for electronic data and documents provided to the CEC 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.
- Project management documents will be in Microsoft Project file format, version 2007 or later.

- **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 CEC'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 CEC 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;
  - Invoicing and auditing procedures;
  - 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);
- Progress reports (subtask 1.5);
- Final Report (subtask 1.6);
- Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
- Any other relevant topics.

- Provide *Kick-off Meeting Presentation* to include but not limited to:
    - Project overview (i.e. project description, goals and objectives, technical tasks, expected benefits, etc.)
    - Project schedule that identifies milestones
    - List of potential risk factors and hurdles, and mitigation strategy

- Provide an *Updated Project Schedule, Match Funds Status Letter,* and *Permit Status Letter*, 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:

- Kick-off Meeting Presentation
- Updated Project Schedule *(if applicable)*
- Match Funds Status Letter (subtask 1.7) *(if applicable)*
- Permit Status Letter (subtask 1.8) *(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 CEC 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 CEC 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 CEC.

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 CEC, 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 and submit 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.
- Attend the CPR meeting.
- Present the CPR Report and any other required information at each CPR meeting.

The CAM shall:
- Determine the location, date, and time of each CPR meeting with the Recipient's input.
- Send the Recipient a *CPR Agenda* with 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)

CAM Products:
- CPR Agenda
- 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 CEC 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 procured equipment.
  - The CEC'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.
  - "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 copies of *All Final Products* on a USB memory stick, organized by the tasks in the Agreement.

Products:

- Final Meeting Agreement Summary *(if applicable)*
- Schedule for Completing Agreement Closeout Activities
- All Final 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 Funds 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. When creating the Final Report Outline and the Final Report, the Recipient must use the CEC 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 *Energy Commission Style Manual* provided by the CAM.

Recipient Products:
- Final Report Outline (draft and final)

CAM Product:
- Energy Commission 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, Energy Commission 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)
- Submit a draft of the Executive Summary to the TAC for review and comment.
- Develop and submit a *Summary of TAC Comments* received on the Executive Summary. For each comment received, the recipient will identify in the summary the following:
  - Comments the recipient proposes to incorporate.

- Comments the recipient does propose to incorporate and an explanation for why.
- 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.
- Incorporate all CAM comments into the *Final Report*. If the Recipient disagrees with any comment, provide a *Written Responses to Comments* explaining why the comments were not incorporated into the final product.
- Submit the revised *Final Report* electronically with any Written Responses to Comments within 10 days of receipt of CAM's Written Comments on the Draft Final Report, unless the CAM specifies a longer time period or approves a request for additional time.

Products:
- Summary of TAC Comments
- Draft Final Report
- Written Responses to Comments *(if applicable)*
- 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 CEC 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 CEC 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 CEC 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.
- 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 <u>no permits</u> 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)*

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 each 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.

- Help set the project team's goals and contribute to the development and evaluation of its statement of proposed objectives as the project evolves.
- Provide a credible and objective sounding board on the wide range of technical and financial barriers and opportunities.
- Help identify key areas where the project has a competitive advantage, value proposition, or strength upon which to build.
- Advocate, to the extent the TAC members feel is appropriate, on behalf of the project in its effort to build partnerships, governmental support and relationships with a national spectrum of influential leaders.
- Ask probing questions that insure a long-term perspective on decision-making and progress toward the project's strategic goals.

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;
- 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.

The TAC shall:

- Help set the project team's goals and contribute to the development and evaluation of its statement of proposed objectives as the project evolves.
- Provide a credible and objective sounding board on the wide range of technical and financial barriers and opportunities.
- Help identify key areas where the project has a competitive advantage, value proposition, or strength upon which to build.
- Advocate on behalf of the project in its effort to build partnerships, governmental support and relationships with a national spectrum of influential leaders.
- Ask probing questions that insure a long-term perspective on decision-making and progress toward the project's strategic goals.
- Review and provide comments to proposed project performance metrics.
- Review and provide comments to proposed project Draft Technology Transfer Plan.

Products:

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

Subtask 1.12 Project Performance Metrics
The goal of this subtask is to identify key performance targets for the project. The performance targets should be a combination of scientific, engineering, techno-economic, and/or programmatic metrics that provide the most significant indicator of the research or technology's potential success.

The Recipient shall:

- Complete and submit the draft *Project Performance Metrics Questionnaire* to the CAM prior to the Kick-off Meeting.
- Present the draft *Project Performance Metrics Questionnaire* at the first TAC meeting to solicit input and comments from the TAC members.
- Develop and submit a *TAC Performance Metrics Summary* that summarizes comments received from the TAC members on the proposed project performance metrics. The *TAC Performance Metrics Summary* will identify:

- TAC comments the recipient proposes to incorporate into the final *Project Performance Metrics Questionnaire*.
- TAC comments the recipient does not propose to incorporate with and explanation why.

- Submit a final *Project Performance Metrics Questionnaire* with incorporated TAC feedback.
- Develop and submit a *Project Performance Metrics Results* document describing the extent to which the recipient met each of the performance metrics in the final *Project Performance Metrics Questionnaire*.
- Discuss the final *Project Performance Metrics Questionnaire* and *Project Performance Metrics Results* at the Final Meeting.

Products:

- Project Performance Metrics Questionnaire (draft and final)
- TAC Performance Metrics Summary
- Project Performance Metrics Results

IV. TECHNICAL TASKS

TASK 2: RECRUIT PARTICIPATING SITES

The goal of this task is to offer subsidized automation systems to AEU in exchange for their commitment to participate in the project, to make commercially reasonable efforts to shift load according to price signals embedded in their applicable tariff or dynamic pricing tariffs if they emerge during the term of the project and/or to participate in demand response programs.

The Recipient shall:

- Develop a list of prospective participants.
- Contact prospective participants through direct outreach, marketing channels and partners.
- Request utility data access (where not already provided).
- Prepare pump and meter-level analyses of load shift opportunities for prospective participants.
- Present automation and savings opportunity to prospective participants.
- Develop customized automation solutions for participants.
- Execute sales and participation agreements with participants.
- Prepare a *Quarterly Recruitment Report* that includes but is not limited to:
    - Summary of recruitment efforts.
    - The number of meters analyzed.
    - The estimated DR and load shift opportunity savings and operational requirements.
    - The number of proposals delivered.
    - The number of participation agreements executed.
- Prepare a *CPR Report* and participate in a CPR Meeting in accordance with Subtask 1.3.

Products:

- Quarterly Recruitment Report
- CPR Report

TASK 3: DEPLOY HARDWARE AND COMMISSION AUTOMATION SYSTEMS

The goal of this task is to deploy automation systems at participating pump sites.

The Recipient shall:

- Create a deployment plan for each customer pump site.
- Schedule installation(s) with electrical and mechanical contractor(s)
- Coordinate installation timing and requirements with the customer.
- Verify that each system is installed according to the deployment plan.
- Configure and test remote monitoring and control in myPOLARIS.
- Prepare a *Quarterly Deployment Report* that summarizes the number and types of systems deployed during the period and includes high quality digital photographs.

Products:

- Quarterly Deployment Report

TASK 4: TRAINING, OPERATION AND ONGOING SUPPORT OF CUSTOMER SYSTEMS

The goal of this task is to provide participants with the technical and market competence to operate the automation systems and implement irrigation schedules that achieve customer and project goals.

The Recipient shall:

- Conduct online demonstration and training for customer personnel.
- Monitor usage statistics for the application where possible.
- Monitor schedules executed by the user.
- Conduct periodic reviews of usage and results with customers.
- Respond to customer support requests.
- Support and coach participants in DR event execution.
- Prepare a *Quarterly Operations Report* that summarizes use of the system and usage in peak/ramp periods compared with prior years.

Products:

- Quarterly Operations Report

TASK 5: SOFTWARE PRODUCT DEVELOPMENT

The goal of this task is to expand the Recipients platform to include all the functionality required for users to implement grid-responsive irrigation schedules, directly through the Recipients network and pump automation controller or via Application Programming Interfaces (API) to one or more third-party irrigation platforms.

The Recipient shall:

- Develop a myPOLARIS feature to recommend the lowest cost irrigation schedule based on user-supplied operational requirements and constraints.
- Develop a myPOLARIS feature to show users calculated savings from load shift.
- Develop and extend APIs to deliver the Recipient scheduling solution via one or more third-party systems.
- Implement new rates and tariffs as applicable.
- Implement connections to publishers of dynamic pricing signals made available to California agricultural customers during the project.
- Develop additional features and capabilities as determined by market research and regulatory proceedings.
- Extend Recipients' Green Button implementation to access customer data from Southern California Edison.
- Prepare *Quarterly Software Product Development Report* that summarizes expanded functionality of Recipient platform, why functionality required to implement grid-responsive irrigation schedules and includes software screenshots.

Products:

- Quarterly Software Product Development Report

TASK 6: HARDWARE PRODUCT DEVELOPMENT

The goal of this task is to develop hardware solutions to specific requirements emerging from projects developed under this scope. For that reason, the specifications of the hardware enhancements are not defined in this scope as they are meant to address obstacles to automation that emerge in the recruiting task.

The Recipient shall:

- Develop hardware solutions as needed to enable pump site automation.
- Prepare *Quarterly Hardware Product Development Report* that summarizes the specifications of the hardware enhancements made to enable pump site automation that includes high quality digital photographs.

Products:

- Quarterly Hardware Product Development Report

TASK 7: 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:

    - <u>For Product Development Projects and Project Demonstrations:</u>
        - 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.
        - <u>Additional Information for Product Development Projects</u>:
            - 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.
            - 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 CEC 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 8: TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES
The goal of this task is to ensure the technological learning that resulted from the demonstration(s) is captured and disseminated to the range of professions that will be responsible for future deployments of this technology or similar technologies.

The Recipient Shall:

- Develop and submit a *Project Case Study Plan (Draft/Final)* that outlines how the Recipient will document the planning, construction, commissioning, and operation of

the technology or system being demonstrated. The *Project Case Study Plan* should include:
- An outline of the objectives, goals, and activities of the case study.
- The organization that will be conducting the case study and the plan for conducting it.
- A list of professions and practitioners involved in the technology's deployment.
- Specific activities the recipient will take to ensure the learning that results from the project is disseminated to those professions and practitioners.
- Presentations/webinars/training events to disseminate the results of the case study.

- Present the *Draft Project Case Study Plan* to the TAC for review and comment.
- Develop and submit a *Summary of TAC Comments* that summarizes comments received from the TAC members on the *Draft Project Case Study Plan*. This document will identify:
    - TAC comments the recipient proposes to incorporate into the *Final Technology Transfer Plan*.
    - TAC comments the recipient does not propose to incorporate with and explanation why.
- Submit the *Final Project Case Study Plan* to the CAM for approval.
- Execute the *Final Project Case Study Plan* and develop and submit a *Project Case Study (Draft/Final)*
- When directed by the CAM, develop presentation materials for an CEC- sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the California CEC.
- 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.

Products:
- Project Case Study Plan (Draft/Final)
- Summary of TAC Comments
- Project Case Study (Draft/Final)
- High Quality Digital Photographs

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

RESOLUTION NO: 21-04-14-17

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: POLARIS ENERGY SERVICES, INC.

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

RESOLVED, that the CEC approves Agreement EPC-20-019 with Polaris Energy Services, Inc. for a $2,884,912 grant to increase agricultural demand flexibility. This project will deploy enhanced automated irrigation pump controls to enable demand flexibility at agricultural sites in the Central Valley of California; and

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

CERTIFICATION

The undersigned Secretariat to the CEC 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 CEC held on April 14, 2021.

AYE:
NAY:
ABSENT:
ABSTAIN:

____
Patricia Carlos
Secretariat