2016 State Water Efficiency and Enhancement Program

State Water Efficiency and Enhancement Program is funded by the "California Climate Investments" program

Request for Grant Applications

Released:
November 20, 2015

Grant Applications Due:
By 5:00 p.m. PST on January 8, 2016
No late submissions accepted.

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Table of Contents

Background and Purpose

The California Department of Food and Agriculture (CDFA) is pleased to announce, in coordination with the State Water Resources Control Board (SWRCB) and the Department of Water Resources (DWR), a competitive grant application process for the 2016 State Water Efficiency and Enhancement Program (SWEEP) Round I.

The 2016 SWEEP funding arises from Budget Act of 2015, SB 101, (Chapter 321, Statues of 2015), which authorizes CDFA to "support greenhouse gas emission reductions through water and energy efficiency grants promoting water and energy savings." SWEEP is funded through the Greenhouse Gas Reduction Fund referred to as the "California Climate Investment" program.

The program's objective is to provide financial incentives for California agricultural operations to invest in water irrigation systems that reduce greenhouse gas (GHG) emissions and save water.

Funding and Duration

The 2016 SWEEP Round I will disperse up to $16 million to California agricultural operations investing in irrigation systems that reduce GHG emissions and save water. The maximum grant award is $200,000 with a recommended 50 percent match of the total project cost. The maximum grant duration is 12 months and grant funds cannot be expended before April 1, 2016 or after March 31, 2017. Therefore, project installation must be completed no later than March 31, 2017. CDFA reserves the right to offer an award different than the amount requested.

Eligibility and Exclusions

The irrigation project must be on a California agricultural operation. For the purpose of this program, an agricultural operation is defined as row, vineyard, field and tree crops, commercial nurseries, nursery stock production, and greenhouse operations.

Projects ***must*** reduce GHG emissions ***and*** save water. Applicants must provide supporting documentation directly related to actual, on-farm water consumption and GHG emissions during the prior growing season to be eligible for funding.

SWEEP funding cannot be combined with United States Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS) Environmental Quality Incentive Program financial assistance.

Timeline

The application period begins November 20, 2015. The deadline to submit an application is January 8, 2016 at 5 p.m. PST. ***No exceptions will be granted for late submissions.***

CDFA will conduct four workshops and one webinar on the grant solicitation process and program requirements, including how to complete and submit a 2016 SWEEP Round I application. For application workshop schedule and locations, visit the SWEEP website at www.cdfa.ca.gov/go/SWEEP.

Invitation to submit Grant Applications	November 20, 2015
Application Workshops & Webinar	December 1 – 10, 2015
Grant Applications Due	**January 8, 2016 5:00 p.m. PST**
Announce and Award Funding	March 2016

Applicants must submit grant applications online using the Financial Assistance Application Submittal Tool (FAAST) to answer all questions required for submission of a 2016 SWEEP Round I application. CDFA will advise all applicants as to the outcome of the Grant Application Review.

Project Types

CDFA has identified seven project types that address GHG emission reductions and water conservation. The project types are intended to clearly define the 2016 SWEEP priorities and guide prosepective applicants to develop projects that achieve GHG emission reductions ***and*** water savings. Applicants should consider incorporating several projects types listed below in order for a proposed project to achieve both GHG emission reductions ***and*** water savings.

Note: CDFA or a CDFA contracted entity (e.g., Resource Conservation District (RCD)) will conduct a pre-project consultation and post-project site visit to evaluate the site and post-project quantification of GHG reductions and water savings. Agricultural operations are required to maintain records related to the project and documentation of GHG reductions and water saving associated with each project type implemented for three years. CDFA will conduct auditing functions on the GHG reductions and water savings documentation maintained by growers during this period. (See page 11 under Award Process for requirements regarding project documentation and project site visits.)

Water Conservation Priorities

Project types

Weather, Soil or Plant based sensors for irrigation scheduling

Examples include soil moisture or plant sensors (NRCS Conservation Practice Standard 449) with electronic data output or electronic weather station linked to irrigation controller, for growers to ensure efficient irrigation scheduling. Use of ET based irrigation scheduling, such as the California Irrigation Management Information System (CIMIS) on existing or proposed projects to optimize water efficiency for crops. Telemetry components that allow the electronic communication between technology devices are eligible for funding through SWEEP.

Micro-Irrigation or Drip Systems

Use of micro-irrigation or drip systems, including sub-surface drip systems. Should follow NRCS Conservation Practice Standard 441.

Greenhouse Gas Emission Reduction Priorities

Project types

Fuel Conversion

The conversion of a fossil fuel pumps to solar, wind, electric, or natural gas resulting in a reduction of GHG emissions. Renewable energy, including solar, installations that power irrigation systems are eligible for SWEEP funding.

Improved Energy Efficiency

Examples include retrofitting or replacing pumps. NRCS Conservation Practice Standard 372 may apply.

Low Pressure Systems

Use of low pressure irrigation systems to reduce pumping and energy use. For example, the conversion of a high pressure sprinkler system to a low pressure micro-irrigation system or lower pressure sprinkler system. Should follow NRCS Conservation Practice Standards 441 or 442.

Variable Frequency Drives

Use of Variable Frequency Drives to reduce energy use and match pump flow to load requirements. Should follow NRCS Conservation Practice Standard 533.

Reduced Pumping

For example, improved irrigation scheduling may lead to reduced pump operation times.

Other Management Practices

CDFA supports innovative projects and understands there is variability in irrigation systems throughout California. For this reason, applicants may propose projects that do not fit into the above project types as long as water savings can be calculated and GHG reductions can be quantified using the Air Resources Board (ARB)-approved methodology.

Program Requirements

An agricultural operation can only submit one application using a unique tax identification number.

An agricultural operation must use the operation's legal business name and associated tax identification number in their application. The business name provided in the application is the operation entity to which CDFA will extend a Grant Agreement if the project is selected for an award of funds. (See page 11 for details regarding the Award Process.)

Applications ***cannot*** build upon a previously funded 2015 SWEEP project directly affecting the same (Assessor's Parcel Number(s)). However, applicants are encouraged to apply for a new project with different parcel(s).

Applicants must include flow meters in their proposed project or demonstrate actual water use will be ***measured*** with existing flow meters. (See page 5 for more specifics on project design requirements.)

CDFA, in consultation with ARB, developed a GHG calculation methodology for use in estimating proposed projects GHG reductions. This SWEEP GHG Calculator Tool is intended to assist applicants in determining GHG reductions from estimated on-farm energy savings as a result of project implementation.

Applicants are required to use the ARB-approved GHG quantification methodology and GHG Calculator Tool provided in Section B of the California Air Resources Interim Quantification Methodology for SWEEP, which is available at: http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/draftsweepqm.pdf

(See Appendix C for a direct link to the GHG Calculator Tool.)

SWEEP grant funds cannot be used to:

- Expand existing agricultural operations (i.e., additional new acreage cannot be converted to farmland)
- Install new groundwater wells or increase well depth
- Test new technology or perform research.

(See page 7 for information on allowable and unallowable costs.)

If awarded, recipients must agree to a pre-project consultation and a post-project verification conducted by CDFA representative, or in partnership with a local RCD, to evaluate the project site and quantification of GHG reductions and water savings. In addition, recipients must agree to maintain and provide CDFA with water and energy use records associated with each project type implemented for three years following project implementation in order for CDFA to evaluate the long-term success of SWEEP funded projects in terms of GHG reductions and water savings achieved.

Recipients are expected to use and maintain their system for a minimum of 10 years, to the extent feasible, or according to the USDA NRCS Practice Lifespan Table.

(See page 11 for more details regarding project implementation requirements.)

Technical Assistance

CDFA strongly encourages applicants to obtain technical assistance from a professional irrigation specialist when developing their grant application. These specialists are key resources in calculating the potential GHG reductions and water savings of the project design. Therefore, the technical assistance of professional irrigation specialist will improve the accuracy of GHG reductions and water savings calculations resulting in a more competive application. Below are technical assistance resourses to consider:

- Local Resource Conservation Districts (RCDs) – search for a local RCD office at: www.conservation.ca.gov/dlrp/RCD/Pages/CaliforniaRCDs.aspx

- USDA NRCS Technical Service Providers (TSP) – search for a TSP with irrigation expertise at: http://techreg.sc.egov.usda.gov/CustLocateTSP.aspx

Grant Application Process

How to Apply

CDFA continued its partnership with the State Water Resources Control Board (SWRCB) to host a web-based application submission process. Grant applications must be submitted electronically on the Financial Assistance Application Submittal Tool (FAAST) system. Applicants must register to receive a login account for FAAST in order to submit an application. FAAST can be accessed through the SWRCB website: https://faast.waterboards.ca.gov.

FAAST is organized into several tabs and includes a question and answer format. There is a series of questions requesting information regarding the proposed project. Questions are answered in one or more of the four following formats: a drop down menu; a check box; a text box with predetermined character limitations; or as a document attachment.

Prior to beginning the electronic data entry using the FAAST system, applicants are encouraged to gather all required information using Appendix A, B, and C to facilitate effective and timely submission of the application. Applicants are required to submit five types of attachments: (1) Project Design; (2) Budget Worksheet (Appendix B); (3) baseline water use documentation; (4) baseline GHG emission documentation; and (5) completed GHG Calculator Tool.

Project Design

A design plan is essential for establishing water and energy efficiency. A design plan ***must*** be submitted with the grant application. Applications will be evaluated based on specific project types that increase water conservation by improving irrigation systems, and through energy efficiencies, reduced pumping, or fuel conversions that reduce GHG emissions. Applicants are required to submit a project design for the proposed irrigation system, including an explanation of how GHG reductions and water savings will be achieved.

Project design should:

- *Identify pertinent agronomic information, such as the crop and water distribution uniformity value of the irrigation system*
- *Include flow meters or demonstrate actual water use will be measured with existing flow meters*
- *For new infrastructure, such as new irrigation pipping, pumps, or sensors, include a detailed schematic and locations of the where that infrastructure will be installed on the field*
- *For improvements to existing infrastructure, include a schematic illustrating where the improvements will be made to the existing infrastructure*
- *For use of evapotranspiration (ET) based irrigation scheduling, show water deliveries can be made on a consistent basis to accommodate that scheduling*
- *For projects not including equipment installation, a narrative describing the project, including agronomic information, must be submitted with the application and attached as the project design*

Water and Energy Use Documentation

Applicants are required to submit their water and energy use records to substantiate water savings and GHG reductions calculations provided in their application. Applicants must use actual, (from the prior growing season) on-farm water and energy use documentation to calculate baseline water use and GHG emissions. ***Applications that do not attach the required types of water and energy use documentation cannot be funded.***

The requirements pertaining to water and GHG documentation are specified below:

Water Use Documentation

The actual baseline water value provided in the application must be supported by the documentation attached to the application. Applicants must provide a detailed explanation in the application how the baseline water use value is directly related to the actual, on-farm water use data in the supporting documentation.

The USDA, NRCS Field Office Technical Guide – Irrigation Water Savings Calculator is a useful tool to assist applicants in calculating their baseline water use and projected water savings after project installation. (See Appendix C: Supplemental Guidance for Determining Water Use and Greenhouse Gas Emissions.)

Since applicants must input specific variables directly related to on-farm irrigation, the Irrigation Water Savings Calculator is sufficient supporting documentation to demonstrate baseline water use. Applicants that have actual on-farm water documentation (e.g., water bills, flow meter readings, pump efficiency tests, or other on-farm water records), should submit those documents to support their water calculations provided in their application.

If applicants maintain other types of actual on-farm water records, applicants may submit those documents to substantiate their baseline water use. In addition, applicants must provide a narrative explaining how the baseline water use value calculated is supported by the documentation attached to the application.

Allowable Baseline Water Documentation				
Water Bills	Flow Meter Readings	Pump Efficiency Tests	Other On-farm Water Records	USDA NRCS Irrigation Water Savings Calculator

Greenhouse Gas Emission Documentation

Applicants must follow the ARB-approved GHG quantification methodology, which can be found at: http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/draftsweepqm.pdf. This methodology utilizes a GHG calculator tool developed by CDFA to estimate GHG emission reductions from changes in fuel use.

The actual GHG baseline value provided in the application must be supported by the documentation attached to the application. Applicants must address in the application how the baseline value is directly related to the actual on-farm energy use data in the supporting documentation.

To meet the GHG supporting documentation requirement, applicants are required to submit actual on-farm energy use for supporting documentation, including-utility bills, actual fuel receipts, and field operational logs (e.g., tractor passes) covering six months of the peak irrigation and growing season. Field operational logs are defined as on-farm data complied during a growing season and maintained as a common business practice by the agricultural operation to capture actual dates and on-farm energy use values. The projected GHG savings value must be based on the six month time period that correlates with the records.

Applicants will be required to describe how the baseline GHG calculation value is supported by the on-farm energy documentation attached to their application. In addition, applicants must explain how the GHG documentation directly relates to the irrigation system.

Allowable Baseline GHG Support		
Utility Bills	Fuel Receipts	Field Operational Logs

CDFA acknowledges calculating baseline GHG emissions and projected GHG reductions is challenging. Therefore, a GHG calculator tool is available on the SWEEP website, and additional online resources and supplemental guidance is provided in Appendix C to assist applicants in this process.

In addition to GHG supporting documentation, applicants are required to complete and attach a copy of the GHG Calculator Tool. Applicants must provide an explanation of inputs used in the calculator in their application.

Budget Worksheet

Applicants are required to complete a Budget Worksheet to itemize all allowable costs related to the proposed project. The Budget Worksheet must be consistent with the project design. (See Appendix B for the Budget Worksheet.)

Applicants should use the USDA, NRCS payment schedules as a guide, to the extent feasible, to determine project costs. (See Appendix D for the USDA, NRCS Payment Schedules.)

Allowable Costs

Project costs must clearly support installation of irrigation systems, including supplies, equipment, and labor.

Supplies: Supplies are items with an acquisition cost under $5,000 per unit and have a useful life of less than one year.

Equipment: Equipment is an article of nonexpendable, tangible personal property and has a useful life of more than one year, and a purchase cost which equals or exceeds $5,000 per unit.

Labor: Costs for labor to install the project components should be reasonable and consistent with rates in the marketplace for the same or similar services.

Examples of allowable costs include:

- *Installation of photovoltaic panels to power irrigation systems*
- *All components of micro-irrigation irrigation systems*
- *Sensor hardware and telemetry*
- *Software associated with sensors, weather stations, or other hardware*
- *Flow meters*

Unallowable Costs

Unallowable costs, include, but are not limited to:

- Project design costs
- Costs associated with technical assistance
- Post-project service charges and maintenance costs associated with the irrigation system
- Non-labor costs (e.g., management) and fees associated with project oversight
- Supplies and equipment costs not related to irrigation or water distribution systems
- Costs associated with drilling of new or expanding groundwater wells
- Irrigation training courses

Review Process

CDFA will conduct two levels of review during the grant application process. The first level of review is an administrative review to determine whether application requirements were met, and if applicable, assess an applicant's past SWEEP grant performance.

The second level review is a technical review by a group of agricultural irrigation water system specialists and experts affiliated with the University of California and California State University systems. The technical reviewers will evaluate grant applications based on practicality and feasibility of the project, including the accuracy of potential GHG reductions and water savings calculations and the validity of energy and water use documentation submitted and attached to applications. ***Applications that fail to demonstrate a proposed project will result in GHG reductions and water savings cannot be funded.***

Additional Considerations

During the review process, the following additional considerations will be evaluated when selecting projects for an award of funds:

- Degree of GHG emission reductions and water savings
- Disadvantaged Community Status (CalEnviroscreen Score)
- Irrigation Training
- Location within a Critical Over-drafted Groundwater Basin
- Soil Management Practices
- New SWEEP Recipients

Disadvantaged Community Benefits

SWEEP will support projects that provide benefits to disadvantaged communities[1]. Providing disadvantaged community benefits is not a requirement for funding or eligibility, but projects that are located within disadvantaged communities and benefit these communities will receive additional consideration during the review process.

To determine if the project benefits a disadvantaged community, the applicant must:

1. Identify their project's census tract number(s) by using the Census Tract Finder online tool at: http://maps.gis.ca.gov/cdfa/tractfinder.html
2. Identify which one of the project criteria is applicable to the project.
3. Identify which approach was taken to identify the community need.

1. Project sites located in a disadvantaged community will be determined by the census tract number(s) provided in applications. Disadvantaged communities are defined by California Environmental Protection Agency as census tracts with CalEnviroscreen scores in the top 25 percentiles. (See CalEnviroScreen for more information)

2. Projects located within a disadvantaged community census tract must address a community need and meet the criteria for providing a benefit. Applicants must select one of the following yes/no criteria:

A. The project provides water and energy use efficiency incentives or other services that reduce energy use to water users (e.g., residential, commercial, agricultural) with a physical address in a disadvantaged community; or

B. The project improves, repairs, or replaces water system infrastructure for water and energy savings within a disadvantaged community.

[1] California Air Resources Board. 2015. Greenhouse Gas Reduction Fund Funding Guidelines. Found at: http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/funding_guidelines_public_proposed_draft_09-04-2015.pdf

3. To determine if the project meets the needs of the disadvantaged community, applicants must select one of the following:

A. Identify how their project addresses a factor in CalEnviroScreen that caused the area to be defined as a disadvantaged community.

B. Host a community meeting to get local input on their project.

C. Identify if their project addresses a common need, these include:

i. Reduce energy costs.

ii. Reduce exposure to local environmental contaminants, such as toxic air contaminants, criteria pollutants, and drinking water contaminants.

iii. Meet other common needs identified by community advocates in ARB's Funding Guidelines (Table 2-2)[1].

D. Receive documentation of community support (e.g., letters or emails).

Irrigation Training

Irrigation training is a critical component to irrigation management and agricultural water conservation. CDFA strongly encourages applicants to participate in an irrigation training course to maximize the benefits of a well-designed and maintained irrigation systems. During the review process, applications will receive additional consideration if the applicant has attended or commits to attend an irrigation training course relevant to the project.

Applicants may consider training resources provided on the program website at www.cdfa.ca.gov/go/SWEEP. However, applicants may also select an alternative training course that best meets the needs of their operation. In order to receive extra consideration for training, applicants must identify the irrigation training course in their application.

If awarded, the irrigation training course will become part of the Grant Agreement between the agricultural operation and CDFA. Therefore, project completion will be conditional upon completing the required training course during the grant term. Recipients must provide evidence (i.e., certificate of completion) confirming attendance. CDFA encourages agriculture operations to consider both the agriculture operation's manager and irrigator attend a training course; however, only one agriculture operation representative is required to attend.

Applicants that previously completed irrigation training must attach evidence (i.e., certificate of completion) to the application confirming attendance to receive the extra consideration during the review process.

Critically Over-drafted Groundwater Basins

Projects that demonstrate reduced groundwater pumping within critically over-drafted groundwater basins will receive extra consideration during the review process. Applicants must use the online map provided below to identify if their project falls within a critically over-drafted groundwater basin as identified by the DWR. A list of the basins, including the basin numbers, is identified in Table 1. If a proposed project reduces groundwater pumping within a critically over-drafted ground water basin, applicants must identify the number of the basin within the application.

Draft List of Critically Over-drafted Groundwater Basins (August 2015)	
Basin Number	**Basin/Subbasin Name**
3-01	Soquel Valley
3-02	Pajaro Valley
3-04.01	180/400 Foot Aquifer
3-04.06	Paso Robles Area
3-08	Los Osos Valley
3-13	Cuyama Valley
4-04.02	Oxnard
4-06	Pleasant Valley
5-22.01	Eastern San Joaquin
5-22.04	Merced
5-22.05	Chowchilla
5-22.06	Madera
5-22.07	Delta-Mendota
5-22.08	Kings
5-22.09	Westside
5-22.11	Kaweah
5-22.12	Tulare Lake
5-22.13	Tule
5-22.14	Kern County
6-54	Indian Wells Valley
7-24	Borrego Valley

Table 1

Draft State-wide map of critically over-drafted groundwater basins

Soil Management Practices that increase Water-Holding Capacity

Increasing soil organic matter has multiple benefits including increased water-holding capacity of the soil and carbon sequestration. These benefits are in line with the purpose of SWEEP, and therefore, CDFA will provide extra consideration to projects that integrate one or more of the following soil management practices provided they do not result in an increase in on-farm water demand or energy use:

- Cover cropping
- Mulching
- Compost application
- Resource conserving crop rotation

The implementation of these practices are not eligible as part of the project if they result in increased on-farm energy or water use. Any of the management practices that are indicated in the project application will become part of the grant agreement terms between the agricultural operation and CDFA upon funding of the project. Awardees should follow any applicable USDA NRCS Conservation Practice Standards when implementing these management practices.

Matching Funds

Applicants are strongly encouraged to include a 50 percent match of the total project cost. Applications that include matching funds will receive additional consideration for funding.

Matching funds are defined as a portion of project costs not borne by the funding source, and can include cash and/or in-kind contributions. In-kind contributions include costs associated with contractors (labor) involved with the installation of the project. Applicants choosing to use matching funds are encouraged to submit written documentation describing the source of matching funds with the grant application.

Assistance and Questions

CDFA cannot assist in the preparation of grant applications; however, general questions may be submitted to grants@cdfa.ca.gov. In order to ensure all potential applicants benefit from receiving all submitted questions and answers, CDFA will post Frequently Asked Questions (FAQ) on November 20, 2015 on the SWEEP website and an additional FAQ will be posted according to the following schedule:

Questions Received by:	Responses Posted by:
December 14, 2015 at 8:00 am PST	December 16, 2015 at 5:00 pm PST

In order to maintain the integrity of the competitive grant process, CDFA is unable to advise and/or provide applicants with any information regarding specific applications during the solicitation process.

The SWRCB website at https://faast.waterboards.ca.gov also contains a Frequently Asked Questions section and a User's Manual for the FAAST system. If after reading the information available on the website, you have questions about the FAAST system, please contact FAAST customer service at (866) 434-1083, Monday through Friday, 8:00 a.m. to 5:00 p.m. PST or via email, faast_admin@waterboards.ca.gov.

Award Process

Grant Agreement

CDFA will initiate the Grant Agreement process with applicants selected to receive a 2016 SWEEP grant award. Applicants with projects selected for award of funds will receive a Grant Agreement package with specific instructions regarding award requirements including information on project implementation, verification, and payment process.

Project Implementation

Once a Grant Agreement is executed, the grant recipient can begin implementation of the project.

Following execution of the Grant Agreement, recipients must agree to a pre-project consultation conducted by CDFA representative or a local RCD to discuss project implementation plans and evaluate the project site, including taking photographs to document the project site "before" implementation.

Recipients are responsible for the overall management of their awarded project to ensure all project activities, including labor associated with installation, are completed no later than March 31, 2017.

For projects involving utility interconnection, recipients must take the necessary steps to begin the interconnection process after execution of the Grant Agreement to ensure utility interconnection work is complete by this date.

CDFA may conduct a Critical Project Review upon reasonable notice at any time during the project term. The purpose is to determine whether deliverables are being met and evaluate project progress to ensure installation is complete within the grant term. Recipients may be required to submit financial records and project documentation to ensure SWEEP funds are used in compliance with the Grant Agreement terms and conditions.

Payment Process

CDFA will provide the grant recipient with the necessary grant award and invoicing documents. Grant recipients may be eligible to receive an advance payment up to 25 percent of the total grant award for project installation. The remaining funds will be allocated on a reimbursement basis through quarterly or monthly invoicing.

CDFA will withhold 10 percent from the total grant award until the verification requirement is complete to ensure grant recipients install their project as approved by CDFA. Invoicing and closeout of all project expenditures must be completed by June 30, 2017.

Project Verification

Following project implementation, a CDFA representative, or in partnership with a local RCD, will initiate the verification component. The verifier will visit the project site, and inspect the completed project to ensure design specifications were met and the system is working effectively. In addition, the verifier will take photographs to document project completion. The verification component must be completed by May 31, 2017.

Post-Project Completion Requirements

Execution of the Grant Agreement is conditional upon agreement to post-project completion requirements. Recipients are expected to maintain documentation related to the SWEEP funded project, including energy and water use documentation, to report actual benefits achieved for a period of three years after project completion. The purpose of this reporting is to demonstrate the long-term success of SWEEP awarded projects by documenting GHG emission reductions and water savings data.

After the project is operational, CDFA will work with recipients to collect the necessary data and quantify GHG emission reductions and water savings. Failure to work with CDFA and provide the necessary project documentation will be considered non-performance. In the event of non-performance, CDFA may take any action deemed necessary to recover all or any portion of the grant funding.

APPENDIX A: GRANT APPLICATION QUESTIONS (AS THEY APPEAR IN FAAST)

Under the General Information and Project Budget tabs, applicants must respond to the following:

Applicant Organization:
Legal business name of Agriculture Operation that will be the lead applicant for this project

Submitting Organization:
Name of organization submitting application

Project Title:
Insert a title that is clear, concise, and descriptive of the project

Project Description:
Briefly summarize proposed project including all project types addressed and crop type

Project Budget:
Funds requested and anticipated matching funds

Under the Application Questionnaire tab, applicants must also respond to the following Grant Application questions based on SWEEP requirements:

SECTION I: PREVIOUSLY FUNDED PROJCET

1. Has your agriculture operation received a previously funded SWEEP project?

    a. If yes, provide the SWEEP Agreement Number(s) and corresponding Assessor's Parcel Number(s) of where each of the project(s) were implemented.

SECTION II: PROPERTY LOCATION

2. Indicate property location(s) of where the project will be implemented. Address the following:
    a. Address or Nearest Cross Streets
    b. City, Zip Code
    c. County
    d. Assessor's Parcel Number(s)
    e. Acreage that will be impacted by the project
    f. Total Farm Size in Acres
    g. Current land use and crop

3. Identify the census tract ID Number for each Assessor's Parcel Number impacted by a project using the online tool below.

    Census Tract Finder online tool: http://maps.gis.ca.gov/cdfa/tractfinder.html

Identify which one of the project criteria is applicable to the project.

1. Project sites located in a disadvantaged community will be determined by the census tract number(s) provided in applications. Disadvantaged communities are defined by California Environmental Protection Agency as census tracts with CalEnviroscreen scores in the top 25 percentiles. (See CalEnviroScreen for more information)

2. Projects located within a disadvantaged community census tract must address a community need and meet the criteria for providing a benefit. Applicants must select one of the following yes/no criteria:
   A. The project provides water and energy use efficiency incentives or other services that reduce energy use to water users (e.g., residential, commercial, agricultural) with a physical address in a disadvantaged community; or
   B. The project improves, repairs, or replaces water system infrastructure for water and energy savings within a disadvantaged community.

3. To determine if the project meets the needs of the disadvantaged community, applicants must select one of the following:
   A. Identify how their project addresses a factor in CalEnviroScreen that caused the area to be defined as a disadvantaged community.
   B. Host a community meeting to get local input on their project.
   C. Identify if their project addresses a common need, these include:
      i. Reduce energy costs.
      ii. Reduce exposure to local environmental contaminants, such as toxic air contaminants, criteria pollutants, and drinking water contaminants.
      iii. Meet other common needs identified by community advocates in ARB's Funding Guidelines (Table 2-2)[1].
   D. Receive documentation of community support (e.g., letters or emails).

Explain in detail the approach taken to identify the community need.

4. Provide the Irrigation District(s) where the project will be implemented.

5. Indicate if the property location(s) water source is surface water (i.e., water delivered to the property) or groundwater pumped from on-farm wells.

SECTION III: ESTIMATED WATER AND GHG BENEFITS

6. *Indicate estimated water savings **AND** greenhouse gas emission reductions.*
   a. Indicate the estimated water savings (acre inches/year/acre).
   b. Indicate the estimated greenhouse gas emission reductions (Tonnes of CO_2 equivalent/year/acre).

SECTION IV: PROJECT TYPES

The questions in Section IV apply to the project types established for evaluating applications.

7. *Project Types*
   Address all applicable project types and provide an explanation for all types selected. Only indicate project types that are being incorporated as part of the project.

   NOTE: Do not indicate a project type if it is already the current practice at the project site.

Water Conservation

a. *Weather, Soil or Plant based sensors for irrigation scheduling*
Examples include soil moisture or plant sensors (NRCS Conservation Practice Standard 449) with electronic data output or electronic weather station linked to irrigation controller, for growers to ensure efficient irrigation scheduling. Use of ET based irrigation scheduling, such as the California Irrigation Management Information System (CIMIS) on existing or proposed projects to optimize water efficiency for crops. Telemetry components that allow the electronic communication between technology devices are eligible.

b. *Micro-Irrigation or Drip Systems*
Use of micro-irrigation or drip systems, including sub-surface drip systems. Should follow NRCS Conservation Practice Standard 441.

Greenhouse gas Emission Reduction

c. *Fuel Conversion*
The conversion of a fossil fuel pumps to solar, wind, electric, or natural gas resulting in a reduction of GHG emissions. Renewable energy, including solar, installations that power irrigation systems are eligible.

d. *Improved Energy Efficiency*
Examples include retrofitting or replacing pumps. NRCS Conservation Practice Standard 372 may apply.

e. *Low Pressure Systems*
Use of low pressure irrigation systems to reduce pumping and energy use. For example, the conversion of a high pressure sprinkler system to a low pressure micro-irrigation system or lower pressure sprinkler system. Should follow NRCS Conservation Practice Standards 441 or 442.

f. *Variable Frequency Drives*
Use of Variable Frequency Drives to reduce energy use and match pump flow to load requirements. Should follow NRCS Conservation Practice Standard 533.

g. *Reduced Pumping*
For example, improved irrigation scheduling may lead to reduced pump operation times.

h. *Other Management Practices*
For projects implementing any other management practices that result in GHG reductions and water savings.

SECTION V: CURRENT WATER USE SYSTEM

The questions in Section V apply to the ***current*** irrigation and/or distribution system. The purpose of this section is to understand an applicant's current water use and greenhouse gas emissions.

8. *Description of current water use system*
Describe in detail the ***current*** water use system and associated energy sources. At a minimum, applicants should address the current crop, irrigation type, irrigation management, and fuel source(s).

9. *Is current water use measured either on farm or by the water supplier (e.g., with a flow meter)?*

10. *Current baseline water use*
    a. Indicate current baseline water use per acre (acre inches/year/acre). Refer to Appendix C of the Request for Grant Applications for assistance in calculating baseline water use.

    b. Provide a detailed explanation of the methodologies used to calculate baseline water use.

    c. Explain in detail how the baseline water value calculated is supported by the on-farm water use documentation attached to the application.

    d. Are flow meter logs or other types of water use records or logs attached? If yes, explain how those logs were maintained and how data was collected on-farm.

11. *Current baseline greenhouse gas emissions*
    a. Indicate current baseline greenhouse gas emissions associated with the water use (Tonnes CO_2e/year/acre). Refer to Appendix C of the Request for Grant Applications for assistance in calculating greenhouse gas emissions.

    b. Provide a detailed explanation of the methodologies used to calculate baseline greenhouse gas emissions.

    c. Explain in detail how the baseline greenhouse gas value calculated is supported by the on-farm energy documentation attached to the application.

    d. Are field operational logs attached? If yes, explain how those logs were maintained and how data was collected on-farm.

    e. For on-farm energy documentation attached, provide a detailed explanation of how the documents relate to the irrigation system.

SECTION VI: PROPOSED WATER USE SYSTEM

The questions in Section VI apply to the ***proposed*** water use system on the property. The purpose of this section is to estimate the potential gains in water and energy efficiencies and the associated decrease in greenhouse gas emissions.

12. *Description of proposed water use system*
    Explain in detail the proposed water use system and associated energy sources. At a minimum, applicants should address the proposed crop, irrigation type, irrigation management, and fuel source(s).

13. *Water use after project implementation*
    a. Indicate the estimated water usage of proposed project (acre inches/year/acre).

b. Provide a detailed explanation of the methodologies used to calculate projected water use.

    c. Provide a detailed explanation of how the proposed project will measure applied water after project implementation.

14. *What percentage (0-100) of the estimated total water savings (from Question 6a) will be from surface water supplies?*
    Indicate the percentage of the total water savings that will be surface water (water delivered to the property) as opposed to groundwater pumped from on-farm wells.

15. *Greenhouse gas emissions after project implementation*
    a. Indicate estimated greenhouse gas emissions from the proposed project (Tonnes CO_2e/year/acre).

    b. Provide a detailed explanation of the methodologies used to calculate projected greenhouse gas emissions.

SECTION VII: REQUIRED ATTACHMENTS
Applications must include five required attachments to be considered for funding under this program. Attach the following documents:

16. *Project Design (attachment):*
    Applicants must attach a copy of the proposed system design. Refer to page 5 of the Request for Grant Applications, Project Design section.

    Is the Project Design attached?

17. *Budget Worksheet (attachment):*
    Click HERE to download the "Budget Worksheet."

    Is the "Budget Worksheet" attached?

18. *Baseline Water Documentation (attachment):*
    Is supporting documentation attached for baseline water use calculations?

19. *Baseline Greenhouse Gas Documentation (attachment):*
    Is supporting documentation attached for baseline greenhouse gas emission calculations?

20. *Completed CDFA GHG Calculator Tool (attachment):*
    Is the completed calculator tool attached? Provide a detailed explanation of all inputs.

SECTION VIII: ADDITIONAL CONSIDERATIONS
Section VIII is not required, but the following will receive additional consideration.

21. *Training*
    If awarded funding, will a representative from the agriculture operation agree to attend the training? If yes, indicate the training course and the agriculture operation representative(s) planning to attend.

    IMPORTANT REMINDER: If the answer is indicated as "yes", irrigation training will become a term of the grant agreement if the project is awarded funding. This training will be at the cost of the agriculture operation

22. *Critically Over-drafted Groundwater Basin:*
Does the project location fall within a critically over-drafted groundwater basin as identified by the Department of Water Resources? If yes, click HERE to identify the basin number.

23. *Soils Management Practices for Increasing Water-Holding Capacity:*
Indicate which, if any, of these management practices will be implemented with the goal of increasing soil organic matter and water-holding capacity of the soil.

IMPORTANT REMINDER: If these practices are selected and additional consideration is awarded, the selected practices will become a term of the grant agreement.

If yes, select all that apply.

a. Cover cropping
b. Mulching
c. Compost application
d. Resource conserving crop rotation

24. *Matching Funds(attachment):*
If matching funds (cash) have been secured, attach matching funds documentation. Documentation should confirm the contribution source, type, and amount of contributions in support of the project.

If applicable, is matching funds (cash) documentation attached?

Appendix B: Budget Worksheet

2016 SWEEP Round I Budget Worksheet

Instructions: Provide a clear and detailed accounting of project costs necessary to complete the proposed project. Project costs must be itemized into budget categories, including supplies, equipment, and labor. The items listed in these categories will be the total SWEEP grant funds requested for the proposed project. The total grant request amount may not exceed $200,000. *Matching funds can include cash and/or in-kind contributions. Cash contributions are the amount of funds that will be contributed by the applicant to this project. In-kind contributions include contributions by the applicant in the form of supplies, equipment, and labor involved with project installation. For matching funds, provide a brief description of the types of costs, including the quantity, activity, or service needed to complete the project. As needed, add rows to the table below.

Applicant/Agriculture Operation:									
PIN:									
Total Grant Request:	$0								
SUPPLIES: *Items with an acquisition cost under $5,000 per unit and a useful life of less than one year.*	$0	**EQUIPMENT:** *An article of nonexpendable, tangible personal property having a useful life more than one year, and a purchase cost which equals or exceeds $5,000 per unit.*	$0	**LABOR:** *Costs for labor to install the project components.*		$0	***MATCHING FUNDS:** Project costs not borne by the funding source, including cash and/or in-kind contributions.*	$0	$0
Supply Item	**Cost**	**Equipment Item**	**Cost**	**Cost/hour**	**Hours**	**Subtotal**	**Description**	**Cash**	**In-kind**
						$0			
						$0			
						$0			
						$0			
						$0			
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Appendix C: Supplemental Guidance for Determining Water Use and Greenhouse Gas Emissions

SWEEP is funded through the Greenhouse Gas Reduction Fund referred to as the "California Climate Investment" program. Since the GGRF is intended to support greenhouse gas (GHG) emission reductions, all projects receiving SWEEP grant funding must show GHG reductions. Therefore, in order to be eligible for a SWEEP grant, an applicant ***must*** show that ***both*** water savings ***and*** GHG emission reductions will occur due to the proposed project.

Calculating the GHG reductions and water savings associated with an irrigation project is challenging. CDFA recommends applicants obtain technical assistance from professional irrigation specialists, such as the United States Department of Agriculture, Natural Resource Conservation Service (USDA NRCS) and Resource Conservation Districts (RCD), to determine baseline and projected water use and GHG emissions. However, applicants not utilizing those resources can use tools and calculators to determine baseline calculations. This document will provide conceptual guidance, calculators, and resources to assist with the GHG and water calculations.

Water Use

USDA NRCS Field Office Technical Guide – Irrigation Water Savings Calculator

http://efotg.sc.egov.usda.gov/references/public/CA/CA_irrigation_water_savings_9-08.xls

This calculator allows applicants to input specific information related to their current on-farm irrigation system to obtain baseline water use calculations. Similarly, applicants can input specific parameters related to their proposed irrigation system to obtain their projected water savings calculations.
To use the Irrigation Water Savings Calculator: click on the link above and make selections based on the project location. The calculator is a Microsoft Excel file providing options for irrigation system improvement types, level of Irrigation Water Management, soil type, crop type, and ET zone information.

Applicants can determine the section, township and range of their project by using this interactive map:
http://www.geocommunicator.gov/blmMap/MapLSIS.jsp

Use the following definitions to determine the level of Irrigation Water Management for baseline and project water use:

IWM LEVEL	TOOLS INVOLVED	POTENTIAL WATER SAVINGS
NO IWM	no soil moisture equipment, no flow meter	None
LEVEL 1	soil moisture equipment	5% water savings over no IWM
LEVEL 2	soil moisture + flow meter	10% water savings over no IWM
LEVEL 3	soil moisture + flow meter + volumetric management using soil/flow/ET information	15% savings over no IWM

Water Use Equations

Baseline Water Use	**The** pre-project **volume of water that has been applied to the crop over the previous growing season. This is reported in the SWEEP application as acre-inches per year per acre. Use actual on-farm data to support this calculation.** = Total water use over the previous growing season res
Projected Water Use	**The estimated volume of water that will be applied to the crop in the next growing season** after **the proposed project is installed. This is reported in the SWEEP application as acre-inches per year per acre. Use the USDA NRCS irrigation water savings calculator or a project design to determine the estimated total water use during the post-project growing season.** = Estimated total water use uring the growing season fter project a r s
Water Savings	**The estimated volume of water that will be saved due to the project. This is reported in the SWEEP application as acre-inches per year per acre.** = Baseline Water Use – Projected Water Use

Greenhouse Gases

Greenhouse Gas Quantification Concepts

When deciding how to best calculate the GHG reductions from a project, consider the project components and how they influence the energy use of the irrigation system. The following questions may help applicants decide how to proceed with calculating GHG reductions.

1. **Does the project utilize soil moisture sensors and/or irrigation scheduling and/or other management practices that will simply reduce the amount of water applied and therefore reduce pumping?** If there are not any other changes to the infrastructure of the irrigation system, then greenhouse gas savings will be proportional to the percentage of water savings from pumping. (For example, for an irrigation system solely reliant on groundwater, 10 percent water savings = 10 percent greenhouse gas reductions. Another example, for an irrigation system that used 50 percent groundwater, 10 percent water savings = 5 percent greenhouse gas reductions.) Provide supporting documentation regarding baseline on-farm water and energy use. In this situation supporting documentation for the GHG component would be utility billing or fuel invoices associated with pumping. Prepare to explain methodology and inputs in the application.

2. **Does the project improve energy efficiency of pumps or convert energy sources (e.g., diesel to electric)?** If so, greenhouse gas savings will be due to decreased energy use or to the lower emission factor of the new energy system. (For example, electricity has a lower emission factor than diesel.) Utilize the CDFA greenhouse gas calculator for fuels to determine GHG savings. Provide supporting documentation regarding baseline on-farm water and energy use. In this situation supporting documentation for the GHG component would be utility billing or fuel invoices for pumping. Prepare to explain methodology and inputs in the application.

3. **Does the project involve converting from flood irrigation to micro-irrigation and is the project going to result in reduced field operations (e.g., tractor passes)?** Utilize the CDFA greenhouse gas calculator for fuels to determine GHG savings. Provide supporting documentation regarding baseline on-farm water and energy use. In this situation, supporting documentation might be a log of the field operations having to do with the tractor passes required due to furrow irrigation. Prepare to explain methodology and inputs in the application.

Note: If the conversion of the irrigation type from flood to micro-irrigation will increase the pressure or pumping requirements of the system and does not involve a fuel conversion, then the project may not result in net GHG reductions and will, unfortunately, not be eligible for SWEEP funding.

4. **Does the project involve the conversion from a high pressure irrigation system to a lower pressure system?** If energy savings can be inferred from the project then the GHG savings will be due to reduced fuel use. Utilize the CDFA greenhouse gas calculator for fuels to determine GHG savings. Provide supporting documentation regarding baseline on-farm water and energy use. Prepare to explain methodology and inputs in the application.

5. **Does the project combine multiple components such as soil moisture sensors or irrigation scheduling AND fuel conversion AND irrigation type changes?** If so, determining greenhouse gas savings is more complex. (1) Utilize actual on-farm energy records to determine baseline greenhouse emissions using CDFA's GHG calculator for fuels; (2) determine estimated water savings from irrigation changes and irrigation management by using the NRCS water savings calculator; (3) determine how much energy the new system will use to adequately irrigate (matching the results of the NRCS water savings calculator); 4) utilize CDFA's greenhouse gas calculator for fuels to estimate GHG reductions. Plan to explain methodology and inputs in the application.

   Alternatively, calculate greenhouse gas savings based on the fuel conversion component alone (similar to #2 above). This is the component of the project that will likely result in the most significant and verifiable GHG savings.

Glossary of Greenhouse Gas Terms

Carbon dioxide	Carbon dioxide (CO_2) is the primary greenhouse gas emitted through human activities.
Carbon Dioxide Equivalent (CO_2e)	A measure used to compare the emissions from various greenhouse gases based upon their global warming potential. For example, the global warming potential for methane over 100 years is 25.
Emission Factor[2]	The mass of the GHGs emitted per unit of fuel. See table below for emission factors:

Fuel	Emission Factor
Electricity	0.000306 Tonnes CO_2e/kwh
Diesel	0.01024 Tonnes CO_2e/gallon
Gasoline	0.00881 Tonnes CO_2e/gallon
Biodiesel	0.00946 Tonnes CO_2e/gallon
Propane	0.00574 Tonnes CO_2e/gallon
Natural Gas	0.00005 Tonnes CO_2e/SCF

Global Warming Potential	(GWP) is a relative measure of how much heat a greenhouse gas traps in the atmosphere. It compares the amount of heat trapped by a certain mass of the gas in question to the amount of heat trapped by a similar mass of carbon dioxide.
Greenhouse Gases	Gases that trap heat in the atmosphere, contributing to climate change. (In the case of the SWEEP program, the primary greenhouse gas of concern is carbon dioxide which is an emission from fossil fuel combustion during pumping or equipment operations).
Metric Ton (Tonne)	A unit of mass equivalent to 1000 kilograms or 2204.62 pounds.

GHG Equations

Baseline GHG Emissions	**The** pre-project **mass of GHG emissions due to irrigation energy inputs over the previous growing season. This is reported in the SWEEP application as Tonnes CO_2e per year per acre. Use actual on-farm data to support this calculation.** = (Total volume of fuel over previous growing season x Emission Factor) + a r s
Projected GHG Emissions	**The estimated mass of GHG emissions due to irrigation energy inputs in the growing season** after **the proposed project is installed. This is reported in the SWEEP application as Tonnes CO_2e per year per acre**. = (**E**stimated total volume of fuel over the growing season after the proj t x Emission Factor) +acres
GHG Savings	**The estimated mass of GHG emissions that will be saved due to the project. This is reported in the SWEEP application as Tonnes CO_2e per year per acre.** = Baseline GHG Emission - Projected GHG Emissions

[2] *EPA Emission Factors for GHG Inventories* http://www.epa.gov/climateleadership/documents/emission-factors.pdf
This sheet provides emission factors for different energy sources such as diesel, propane, natural gas, and electricity. To calculate emission reductions, multiply the estimated amount of fuel saved by the project by the emission factor of the fuel type. Emission reductions must be reported in Tonnes of carbon dioxide equivalent (CO_2e); numeric factors are provided to convert emissions of methane (CH_4) and nitrous oxide (N_2O) to carbon dioxide equivalent.

Energy and GHG Emissions Calculators

California Air Resources Interim Quantification Methodology for SWEEP

http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/draftsweepqm.pdf

CDFA GHG Calculation Tool for Fuels

https://apps1.cdfa.ca.gov/emissioncalculator/

This calculator will allow the applicant to determine GHG savings by entering the fuel use from before and after project implementation.

Applicants must attach a copy of this completed calculator tool to their application.

COMET-Farm

https://cometfarm.nrel.colostate.edu/Account/LogOn?ReturnUrl=%2fActivityType

COMET-Farm allows applicants to perform an energy audit on their farms.

COMET-Farm Quick Energy Calculator

http://cometfarm.nrel.colostate.edu/QuickEnergy

Although COMET-Farm Quick Energy Calculator is designed to assess GHG reductions after fuel savings are known, it can also be used to determine GHG emissions before project implementation and estimate reductions of GHG emissions after implementation. To determine baseline GHG emissions: (1) input the current use of different energy sources and note the emissions in CO_2e; (2) input the estimated use of the energy sources after implementation and note the emissions in CO_2e; and (3) subtract to find the estimated reductions in GHGs.

National Renewable Energy Laboratory- PVWatts Calculator

http://pvwatts.nrel.gov/

This tool can help an applicant determine the energy generation of a photovoltaic energy system by inputting geographical information and system specifications. This tool may be useful to applicants that plan to install a solar system to power an irrigation system.

Appendix D: USDA NRCS Payment Schedule

Adapted from USDA NRCS EQIP FY **FY15 EQIP Payment Rate Summary List** Regular Rates. Found at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ca/programs/financial/eqip/?cid=stelprdb1268409

This table provides the rates for some likely SWEEP project components. Other Conservation Practice Standards may also apply and be eligible for SWEEP funding.

Practice Code	Practice Name	Component	Unit Type	Unit Cost
372	Combustion System Improvement	IC Engine Repower, <= 25 bhp	BHP	163.53
372	Combustion System Improvement	IC Engine Repower, >25 bhp	BHP	102.46
372	Combustion System Improvement	Electric Motor in-lieu of IC Engine, < 12 HP	Ea	736.45
372	Combustion System Improvement	Electric Motor in-lieu of IC Engine, 12-69 HP	Ea	3181.51
372	Combustion System Improvement	Electric Motor in-lieu of IC Engine, 70-124 HP	Ea	3993.56
372	Combustion System Improvement	Electric Motor in-lieu of IC Engine, 125-174 HP	Ea	7916.87
372	Combustion System Improvement	Electric Motor in-lieu of IC Engine, 175-224 HP	Ea	11992.74
372	Combustion System Improvement	Electric Motor in-lieu of IC Engine, 225-274 HP	Ea	14173.27
372	Combustion System Improvement	Electric Motor in-lieu of IC Engine, 400-499 HP	Ea	27454.2
372	Combustion System Improvement	Electric Motor in-lieu of IC Engine, >= 500 HP	Ea	34652.82
372	Combustion System Improvement	Mobile IC, 50-149 bhp	HP	268.23
372	Combustion System Improvement	Mobile IC, >= 150 bhp	HP	314.85
441	Irrigation System, Microirrigation	Vegetation Establishment	Ac	279.15
441	Irrigation System, Microirrigation	Orchard-vineyard, 10ac or less	Ac	1233.88
441	Irrigation System, Microirrigation	Orchard-vineyard, >10ac	Ac	682.53

441	Irrigation System, Microirrigation	Orchard-vineyard, durable tubing replace	Ac	348.48
441	Irrigation System, Microirrigation	Small Acreage	Ac	1633.18
441	Irrigation System, Microirrigation	Row Crop, Buried Manifold	Ac	826.84
441	Irrigation System, Microirrigation	Row Crop, Above Ground PE Manifold	Ac	505.36
441	Irrigation System, Microirrigation	Retrofit, Irrigation Automation	Ac	455.6
441	Irrigation System, Microirrigation	Filter replace	Ac	277.87
442	Sprinkler System	Center Pivot, < 600 Ft	LnFt	45.56
442	Sprinkler System	Center Pivot, > 600 Ft	LnFt	39.06
442	Sprinkler System	Linear Move System	LnFt	49.22
442	Sprinkler System	Wheel Line System	LnFt	9.64
442	Sprinkler System	Solid Set System	Ac	1247.92
442	Sprinkler System	Solid Set System Renovation	Ac	190.1
442	Sprinkler System	Handline system	LnFt	3.41
442	Sprinkler System	Traveling Gun System, 2" or less diameter Hose	Ea	10074.68
442	Sprinkler System	Traveling Gun System, >2" to 3" Hose	Ea	13068.08
442	Sprinkler System	Traveling Gun System, > 3" Hose	Ea	24131.35
442	Sprinkler System	Big Gun, Stationary	Ea	2587.62
442	Sprinkler System	Pod System	Ea	275.22
442	Sprinkler System	Renovation of Existing Overhead or Wheel line Sprinkler System	LnFt	4.22
442	Sprinkler System	Retrofit, Irrigation Automation	Ac	464.52
449	Irrigation Water Management	Basic IWM <30 acres	Ea	556.6
449	Irrigation Water Management	Basic IWM >= 30 acres	Ac	22.65
449	Irrigation Water Management	Intermediate IWM <30 acres	Ea	834.91
449	Irrigation Water Management	Intermediate IWM >= 30 acres	Ac	33.97
449	Irrigation Water Management	Advanced IWM <30 acres	Ea	1205.98
449	Irrigation Water Management	Advanced IWM >= 30 acres	Ac	46.83
449	Irrigation Water Management	IWM with Soil Moisture Sensors	Ea	985.18

449	Irrigation Water Management	IWM with Soil Moisture Sensors with Data Recorder	Ea	1309.66
449	Irrigation Water Management	IWM with Irrigation Evaluation	Ea	2754.78
449	Irrigation Water Management	IWM with Weather Station	Ea	2966.82
533	Pumping Plant	Electric-Powered Pump ≤ 3 Hp	HP	678.15
533	Pumping Plant	Electric-Powered Pump ≤ 3 HP with Pressure Tank	HP	901.92
533	Pumping Plant	Electric-Powered Pump >3 to 10 HP	HP	226.84
533	Pumping Plant	Electric-Powered Pump >10 to 40 HP	HP	208.32
533	Pumping Plant	Electric-Powered Pump >40 HP, Centrifugal	HP	134.4
533	Pumping Plant	Variable Frequency Drive only (no pump) <=15Hp	Ea	1924.76
533	Pumping Plant	Variable Frequency Drive only (no pump) >15 Hp	HP	117.25
533	Pumping Plant	Internal Combustion-Powered Pump ≤ 7½ HP	HP	334.24
533	Pumping Plant	Internal Combustion-Powered Pump > 7½ to 75 HP	HP	333.44
533	Pumping Plant	Internal Combustion-Powered Pump > 75 HP	HP	201.79
533	Pumping Plant	Windmill-Powered Pump	Ft	507.69
533	Pumping Plant	Solar, <1 Hp	Ea	3539.88
533	Pumping Plant	Solar, 1-3 Hp	Ea	6698.01
533	Pumping Plant	Solar, >3 Hp	Ea	10875.56
533	Pumping Plant	Water Ram Pump	In	564.39
533	Pumping Plant	Livestock Nose Pump	Ea	627.27
533	Pumping Plant	Vertical Turbine Pump and drive, <100 Hp	HP	253.61
533	Pumping Plant	Vertical Turbine Pump and drive, >100 Hp	HP	183.05
533	Pumping Plant	Piston, manure	Ea	9874.2
533	Pumping Plant	Vertical manure pump, PTO	Ea	6790.73
533	Pumping Plant	Chopper manure pump	Ea	1028.72
533	Pumping Plant	Turbine, Pump Only	HP	98.19