

**Technical Report
Long Duration 50 kW Energy Storage with Aquifer Pumped Hydro
Interconnection Report**

California Energy Commission Grant No. EPC 19-058

September 2022



Prepared by:



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INTRODUCTION AND SUMMARY

This is a Technical Report on interconnecting APH (Aquifer Pumped Hydro) to the utility grid as part of California Energy Commission Grant No. EPC 19-058 - Long Duration 50 kW Energy Storage with Aquifer Pumped Hydro. It provides an overview of the information needed, options, processes, and examples of a successful interconnection request.

Willow Springs Water Bank (WSWB), near Lancaster, California, was the site of the APH installation. Southern California Edison Company (SCE) was the host utility, so the interconnection request went through their interconnection process, but interconnecting with any electric utility in California will follow a similar process and require comparable information, forms, and procedures.

The initial interconnection request in May 2021 was for APH on a well at Gaskell and 152nd avenue that had a 250 hp well. Because APH was a new technology that SCE engineers had never seen before, there was considerable back-and-forth with SCE interconnection engineers asking for additional information and clarifications. Final approval of this application (NST-206659) by SCE was obtained March 2022.

During the approval process for NST-206659 SCE came out and performed pump tests on the wells in the area. The pump tests revealed that the well at Gaskell and 152nd avenue had issues (excessive drawdown when pumping). Subsequent investigation revealed that the well had extensive biofouling (a biological slime that was coating the perforations in the well column that limited the amount of water the well could pump). An assessment of alternatives revealed that correcting this clogging would cost approximately \$300,000 with no guarantee of success, so it was decided to abandon this application in favor of a neighboring well that had no such issues - a well at Gaskell and 160th Ave.

The interconnection request for APH at the well at Gaskell and 160thSE avenue (NST-206659) as initiated in early July 2022. Final approval from SCE for interconnection was obtained in early September.

Applying for a utility interconnection will require extremely detailed information on the site, generator characteristics (including make and model), the completion of the proper forms using the interactive utility portal and choosing the proper utility tariff(s). Any information shortages will slow the review process down as the utility engineers will point out the deficiencies and/or ask for additional information or clarifications.

The process can be burdensome but the utility engineers in this case worked with the applicant to resolve any issues/conflicts and obtain a successful interconnection. If an impasse in the interconnection process is reached, there is an Expedited Dispute Resolution process run by the California Public Utilities Commission (CPUC)¹. The expedited dispute resolution process will issue

¹ <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/infrastructure/rule-21-interconnection/expedited-interconnection-dispute-resolution>

binding determinations to electric distribution grid interconnection disputes based on the recommendations of a technical panel within 60 days of the Commission receiving the Application regarding a particular dispute. Appendix J shows this process and the complaint form needed to initiate it.

APH TECHNOLOGY

Aquifer Pumped Hydro (APH) is a form of pumped storage technology that uses the groundwater aquifer as the lower reservoir and a reservoir or storage facility at the ground surface as the upper reservoir. The individual Aquifer Pumped Hydro unit consists of a reversible pump/turbine, a well, and related equipment. Electric well pumps, when supplied with electricity, pump water. When operated in reverse, water forced through the well shaft and impellers, the well motor produces electricity. Motors on existing wells can be repurposed to act as generators. It requires a pressure regulating valve at the bottom of the well, a variable frequency drive (VFD), an interconnection for the grid, a regeneration module, and some electric control modifications. The pump/turbine generates electricity from water flowing down the well (Figure 1). It stores energy at other times by pumping water up the well from the aquifer to the surface consuming electric power (Figure 2).

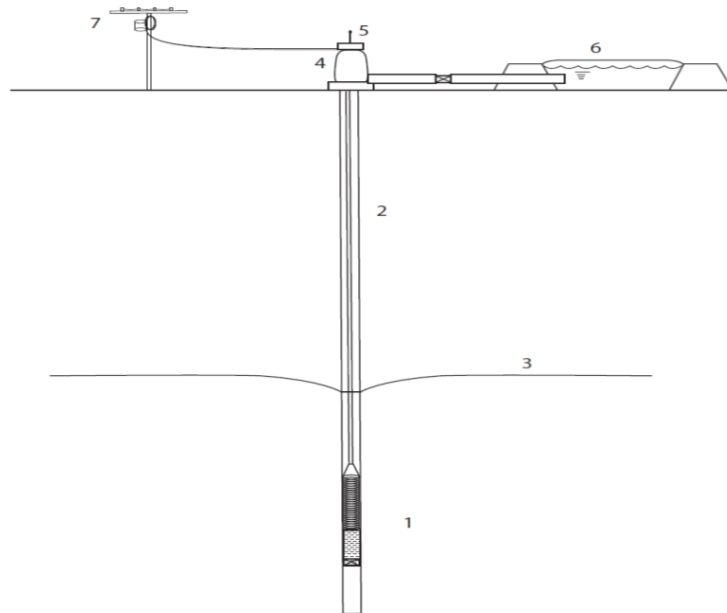


Figure 1. APH Technology. The figure shows an individual unit of the APH modular pumped hydroelectric system. It consists of a reversible pump/turbine unit at the bottom of a well shaft with a control valve [1], the well itself [2], the natural water table of the aquifer which serves as the lower reservoir [3], the electric variable frequency motor/generator for the module [4], the remote control and command of the valves and motor/generator of the module with a VFD [5], the surface reservoir, combined inlet/outlet pipe and flow control valve which constitutes the upper reservoir [6], and the alternating current transformers that connect the module to the electric grid [7].

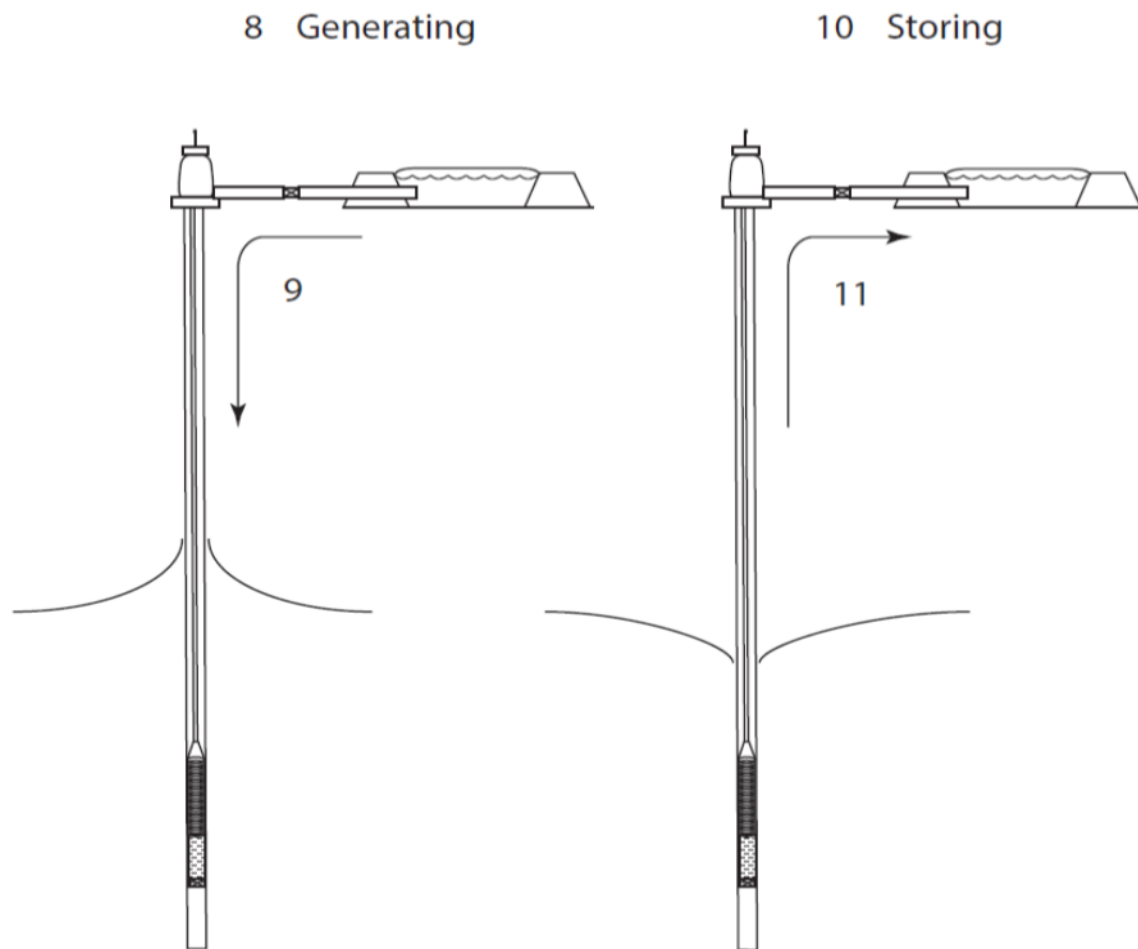


Figure 2. APH Operation. This figure shows the operation of an individual unit of the APH modular pumped hydroelectric system. In **Generating mode**, the water from the surface is injected back through the well pump [9], spinning it backwards and producing electricity. In the **Storage mode** the well pumps water out of the aquifer [11] and into a surface storage facility.

A typical well at WSWB includes a 200 HP, 480 Vac (Volts, alternating current) 3-wire electric pump motor, standard centrifugal vertical-turbine pump, motor control panels, electrical panels, circuit breakers and transformer unit. The vertical-turbine pump is operated in the forward direction using electric power to pump water and can be operated in the reverse direction, “Pump as Turbine” to generate electric power. To enable the pump to operate in the reverse direction to generate electric power, required modifications to the existing system include:

1. Pump shaft modification to enable the shaft to turn in the reverse direction.
2. Addition of a downhole pressure and flow control valve in well pump column and electronic valve control unit. This valve prevents cavitation with the pump impellers and the injection of air into the aquifer.
3. Addition of Power Electronics Controller to excite the motor-generator and rectify the output to enable motor to operate efficiently as a generator.
4. Addition of a grid-tie inverter/rectifier.

5. Addition of System Control and Monitoring for overall control and protection of all the elements of the electrical system, with primary job to route power to and from the energy storage system, local power sources and the loads.
6. Modification of electric system to interface with energy sources, user loads, and utility grid.
7. Possible need for instrumentation upgrades
 - A. Flow meter to measure flow in both directions
 - B. Pressure transmitter on pump discharge
 - C. Level transmitter to monitor level during pumping and injection.

Equipment consists of an existing well pumping water out of the ground in one direction and generating electricity in the other direction. The well motor for this project is an Emerson Motor Company BF84A, rated at 200 hp (150 kW) operating at 480V. The well depth is 800 feet, depth to groundwater is 275 feet. The well casing is 14 inches and the well pumps 1050 gpm (gallons per minute)

TYPES OF INTERCONNECTIONS

Depending upon where the electricity generated by APH is being used, there are two types of utility interconnection applications in California: WDAT and Rule 21. Appendix A: *REPORT ON OPTIONS FOR SALE OF POWER FROM AQUIFER PUMPED HYDRO: Comparison of Available Options Net Energy Metering (NEM), Renewable Energy Selfgeneration Bill Credit Transfer (RES-BCT), Qualifying Facility (QF), and Renewable Market Adjusting Tariff (ReMAT)* describes the generation contractual alternatives currently available in California for APH generation through the local utilities. For these demonstration projects, it was decided to go through the local utility programs (CPUC jurisdictional) due to the fact these are research projects of limited duration, are relatively small (under 1 MW), and no bilateral wholesale contracts were available for the generation produced. Table 1 is a comparison of the various interconnection options for California utilities.

Connections to the transmission system are under Federal Energy Regulatory Commission (FERC) jurisdiction and require Wholesale Distribution Access Tariff (WDAT²). This is used for interconnecting generation facilities to the utilities distribution system and delivering wholesale energy and capacity services to the California Independent System Operator (CAISO) controlled grid or delivering energy or capacity services from the CAISO controlled grid (using utilities distribution system) to their customers. The WDAT is not applicable for projects seeking service under the utility retail rates. Requests for interconnection of generating units under WDAT are under the utility Generator Interconnection Procedures (GIP)³. WDAT applications are generally more costly and time consuming, and more appropriate for generation that is connected to the transmission system and sells power to another

² <https://www.sce.com/business/generating-your-own-power/grid-interconnections/wholesale-distribution-access-tariff>

³ For energy storage projects, the Interconnection Customer must choose the type of Charging Distribution Service: Firm Charging Distribution Service (FCDS), As Available Charging Distribution Service (ACDS), a combination of As-Available and Firm, or None. Additional Study Deposit is required for storage projects requesting firm charging FCDS (\$20,000). Cluster study timelines will add forty-five (45) calendar days for storage projects requesting FCDS.

party. APH uses existing (or new) water wells which are connected to the utility distribution system, not the transmission system, and an ISO transmission level interconnection is not needed.

Electric Rule 21 is the interconnection to the utility’s distribution system, over which the California Public Utilities Commission (CPUC) has jurisdiction⁴. It is used for customer owned generation, where a customer is using the generator to meet its own electrical requirements. For these projects it was decided to use a Rule 21 interconnection application: APH is using existing irrigation well to produce power⁵, APH has on site solar installed to operate electronics (thus qualifies for a Net Energy Metering (NEM)⁶ tariff) but SCE ruled the APH generation, although hydro, did not qualify as renewable generation because electricity from the grid was used to pump the water so the Interconnection Application tariff was a NEM-MT-ST tariff (NEM Multi-Tariff NEM + Non-Export) w/ the Export Addendum⁷.

	Rule 21	Wholesale Distribution Tariffs	Transmission Operator Tariff
Jurisdiction	• CPUC	• FERC	• FERC
Applicability	• Generator/storage retail interconnections retail solicitations or programs • NEM • Non-export Rule 21 • PURPA QFs selling to PG&E)	• Generator/storage wholesale (CAISO market) interconnections	• Any utility, Federal power marketing agency, or person generating Energy for sale or resale Generator/storage wholesale (CAISO market) interconnections
Tariff Owner	• PG&E	• PG&E	• PG&E & CAISO
Interconnection Type	• Distribution or Transmission	• Distribution	• Transmission
Study Process	• Fast Track (FT) • Independent (ISP) • Group (DGSP)	• Fast Track (FT) • Independent (ISP) • Group (DGSP)	• Fast Track (FT) • Independent (ISP) • Cluster
Deliverability	• Not available	• Generator’s option “energy only” or “fully deliverable” (RA eligible)	• Generator’s option “energy only” or “fully deliverable” (RA eligible)
Queue	• First come, first serve for ISP and FT (not linked to CAISO queue cluster)	• Cluster Study projects part of CAISO queue cluster	• Cluster Study projects part of CAISO queue cluster
Costs	• Generator pays study costs, direct interconnection costs, and distribution system costs (no refunds); transmission costs governed under CAISO tariff • Costs exemptions apply to certain customer programs (e.g., NEM, NEM2, ICE-T)	• Generator pays study costs, direct connection costs, distribution system costs (no refunds), and transmission costs (refunds per CAISO Tariff)	• Generator pays study costs, direct connection costs, and transmission costs (refunds per CAISO Tariff)
Timelines (approximate)	• 6 months (fast track); 1+ year (ISP/DGSP)	• 6 months (FT); 18 months (Queue Cluster)	• 6 months (FT); 3-4 years (ISP); and 4-5 years (Cluster)

Table 1. Comparison of Interconnection Options for California Utilities. (Source: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/rule21/past-idf/idf-05152018_rules_2-15-16-21.pptx)

⁴ <https://www.sce.com/business/generating-your-own-power/Grid-Interconnections/Interconnecting-Generation-under-Rule-21>

⁵ <https://www.sce.com/business/generating-your-own-power/Grid-Interconnections/Self-Generation-Programs>

⁶ <https://www.sce.com/business/generating-your-own-power/net-energy-metering>

⁷ Multi-tariff because APH is using two different generation types, NEM for the solar generation, and Export Addendum for the APH generation, which allowed the APH generator to export to the grid for testing purposes.

RULE 21

There are a number of references for Rule 21 applications that should be reviewed prior to submitting an application.

Rule 21 Web Page⁸. A summary of SCE's Rule 21 process.

Rule 21⁹. This is the fundamental reference. It describes the interconnection, operating and metering requirements for generation facilities to be connected to SCE's distribution system.

SCE's Interconnection Handbook¹⁰. This document provides information regarding technical requirements for installing and operating a generation system that meets SCE standards.

SCE's Electrical Service Requirements (ESR)¹¹ manual provides guidance and instructions pertaining to electrical service connections. Its purpose is to guide electrical contractors, engineers, architects, and manufacturers engaged in the installation of electrical service wiring and equipment.

FAQs for SCE's Rule 21¹² is a useful reference that provides answers to commonly asked interconnection questions.

PRE-APPLICATION ACTIVITY

Some background work needs to be done prior to submitting an interconnection application. Specifically, it needs to be determined if there is space available on SCE's distribution system for the APH generation without requiring upgrades to the distribution system. Upgrades will increase the cost of interconnecting.

⁸ <https://www.sce.com/hi/business/generating-your-own-power/Grid-Interconnections/Interconnecting-Generation-under-Rule-21>

⁹ <https://edisonintl.sharepoint.com/teams/Public/TM2/Shared%20Documents/Forms/AllItems.aspx?ga=1&id=%2Fteams%2FPublic%2FTM2%2FShared%20Documents%2FPublic%2FRegulatory%2FTariff%2DSCE%20Tariff%20Books%2FElectric%2FRules%2FELECTRIC%5FRULES%5F21%2Epdf&parent=%2Fteams%2FPublic%2FTM2%2FShared%20Documents%2FPublic%2FRegulatory%2FTariff%2DSCE%20Tariff%20Books%2FElectric%2FRules>

¹⁰ <https://www.sce.com/sites/default/files/inline-files/5599-NEM-Handbook-final.pdf>

¹¹ <https://www.sce.com/regulatory/distribution-manuals/electrical-service-requirements>

¹² <https://www.sce.com/sites/default/files/inline-files/Rule%2021%20FAQ%20final%20ver%202019-08-29.pdf>

DERIM (Distributed Energy Resource Interconnection Map)

SCE maintains a Distribution Resource Plan (DRP)¹³ of their system. This reference provides a wealth of information for every location in the SCE territory on the status of the distribution system¹⁴. The following figure shows a snapshot of the DERIM map for this APH location and the circuit and substation information for this site.

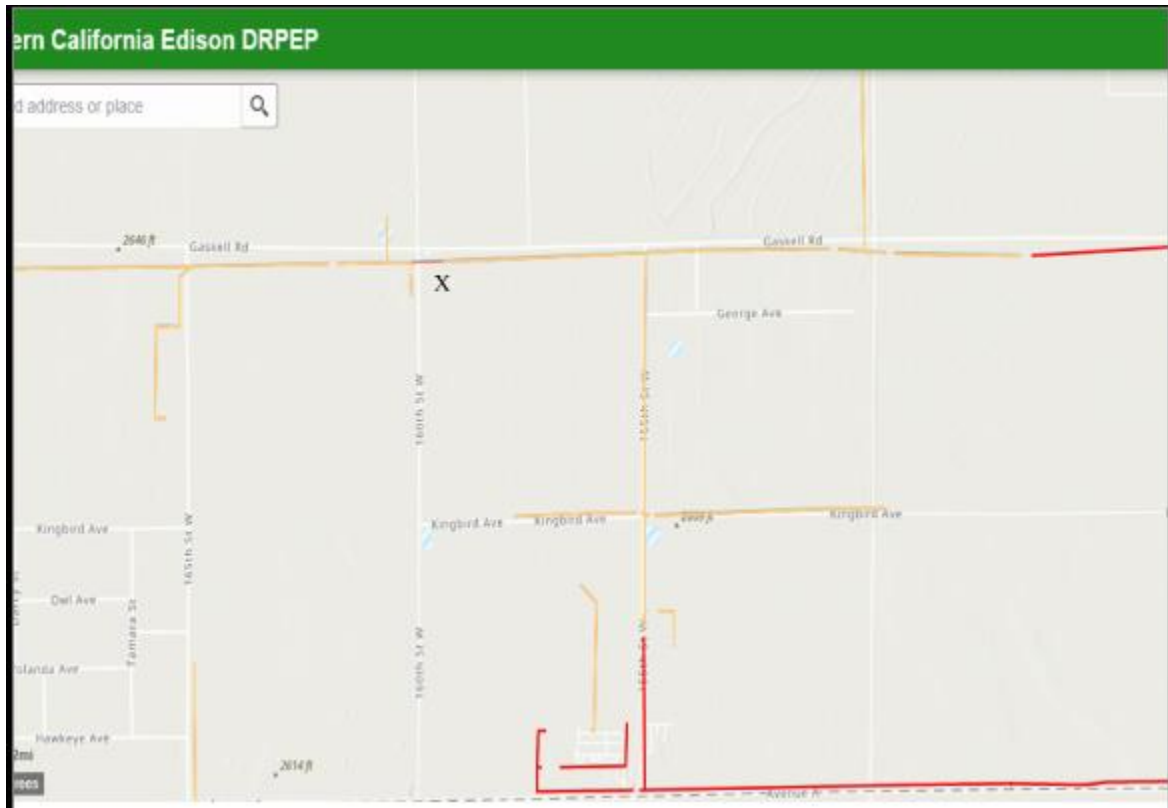


Figure 3. DERIM Map of APH Site

Circuit Level

Circuit Name Duntley
Circuit Voltage (KV) 12
Substation Name Neenach
System Name Antelope 220/66 System
Existing Generation (MW) 0.11
Queued Generation (MW) 0
Total Generation (MW) 0.11

Substation Level

Substation Name Neenach

¹³ <https://drpep.sce.com/drpep/>

¹⁴ The DRPEP site contains interactive users guides for: DRPEP- Distribution Resources Plan External Portal, DDOR – Distribution Deferral Opportunity Report, GNA – Grid Needs Assessment, ICA – Integrated Capacity Analysis, and LNBA – Locational Net Benefit Analysis.

Substation ID NA
System Name Antelope 220/66 System
Existing Generation (MW) 0.11
Queued Generation (MW) 0
Total Generation (MW) 0.11

Pre-Application Report

A Pre-Application Report¹⁵ provides technical information about the current conditions of a specific circuit for interconnecting a project. Getting this report is optional but is recommended. It provides more specific detail than the DERIM map. The Pre-Interconnection Report contains information on

- Total Capacity (in MWs) of substation bus
- Approximate circuit distance between the proposed site and the substation
- Relevant line section(s) peak line load estimate
- Number of protective devices and voltage regulating devices between the proposed site and the substation/area
- Whether or not three-phase power is available at the site
- Limiting conductor rating from proposed Point of Interconnection to distribution substation.

This report can be used to estimate system costs that could be incurred by the interconnection.

Appendix B provides an example of a Pre-Interconnection Report Request¹⁶ for this project. Information on the location, generation type, meter and account numbers are used by SCE to determine the appropriate interconnection location and circuit conditions.

Appendix C is the Pre-Interconnection Report for this project. It contains circuit and substation identifiers, voltage levels, distance to substation, amps, number of protective devices installed, conductor ratings, etc. This report illustrated the timeliness of the report . The report stated that there was 0.1 MW of available capacity on this circuit, but by the time that the interconnection request was finally approved by SCE this capacity has been used by another project in the area.

¹⁵ https://edisonintl.sharepoint.com/:b:/t/Public/Misc/ERLq8u5V_y9DiL4hX8Yd-5oBxoDNFRFomtprvLfVq4MueA?e=aCKWXw

¹⁶ https://library.sce.com/content/dam/sce-doelib/public/regulatory/open-access-information/financial-security-forms/FORM_Rule21_PreApplicationRequest_Form_19-922.pdf

INTERCONNECTION APPLICATION

The actual interconnection application for a Net Energy Metered project is done via an on-line portal, the SCE NEM 2.0 Online Interconnection Application System¹⁷. Instructions on account creation, submitting applications and uploading documentation are available¹⁸.

The interconnection application consists of:

- NEM Application (Form 14-957). This is found in Appendix D. While it is one application there are two components there – one is for the solar installation and one for energy storage (the APH generation)
- Standard NEM GFIA 16-344 (Generating Facility Interconnection Agreement). Found in Appendix E
- Single line diagram (multiple pages, found in Appendix F)
- System Load Justification (Appendix G)
- and the Plot Plan (Appendix H).

INTERCONNECTION APPLICATION DISCUSSION

While the NEM Rule 21 is supposed to be a relatively timely application¹⁹, the first application submitted (for well at Gaskell and 152nd) took 9 months to get approval. There was extensive back and forth with SCE review staff due to the unusual configuration of this application – solar on the electronics shipping container that qualified for NEM, and energy storage that used water instead of electricity. The APH generation SCE rejected as NEM eligible due to the fact that it was charging (pumping water into storage) using grid electricity. NEM-MT-ST (NEM Multi-Tariff NEM + Non-Export) w/ the Export Addendum, which allows the non-renewable inverter-based generator (APH) to export to the grid for testing purposes, was finally settled on as the appropriate application tariff.

¹⁷ <https://scenemsuccessortariff.powerclerk.com/MvcAccount/Login>

¹⁸ https://www.sce.com/wps/wcm/connect/21666712-4d1a-4556-a523-ca8cd36c7a9a/SCE_NEM_Applicant_User_Guide_2015-04-13a.pdf?MOD=AJPERES&projectid=9defc1be-1159-470e-b376-534c7b92b364&projectid=9defc1be-1159-470e-b376-534c7b92b364&projectid=9defc1be-1159-470e-b376-534c7b92b364&projectid=9defc1be-1159-470e-b376-534c7b92b364&projectid=2e063cac-1922-4e86-924f-20ffc0a909fe&projectid=2e063cac-1922-4e86-924f-20ffc0a909fe&projectid=2e063cac-1922-4e86-924f-20ffc0a909fe&projectid=2e063cac-1922-4e86-924f-20ffc0a909fe&projectid=2e063cac-1922-4e86-924f-20ffc0a909fe

¹⁹ NEM Rule 21 timelines for a standard application using standardized generation components in a location where there is adequate interconnection space on the distribution line is: 0-day Application submitted, 10 business days (BD) for SCE to deem application valid, 15 BD for Fast Track Initial Review, 15 BD for SCE to draft GFIA, 7 BD after draft GFIA returned for SCE to approve for signing.

NEM Form 14-957

NEM Form 14-957 is the application form used for an interconnection request. The application is done interactively via an SCE portal (<https://scenemsuccessortariff.powerclerk.com/>). Because it is done interactively, it is recommended that Form 14-957 be filled out completely beforehand and the responses/answers transferred to the utility site during the interactive session.

Appendix D is a summary of the application generated by the SCE portal. There are blank spaces in it (such as contractor name and address) that are not transferred over from the actual application to this reference document, but all entries must be completed during the interactive application session or the application will be rejected.

The first portion of the application is for the solar project (the NEM acceptable generation). The APH generation is summarized under storage.

NEM GFIA 16-344 and Form 14-773

NEM GFIA Form 16-344 is the generating facility interconnection agreement for the solar (NEM) generation. All solar generation will be compensated for under standard NEM agreement.

Form 14-773 is a multiple tariff option. After considerable discussion with SCE staff, it was agreed that APH will not receive credits for exported generation as SCE considers it nonrenewable and it is a research project that will have temporary operation (approx. 18 months) and this application falls under the Uncompensated Export Addendum of Rule 21.

Single Line Diagram

The single line diagram details the electrical components, relationships, and connections. As stated above, a prior interconnection application (NST-206659) was approved but it was decided to abandon that site due to well clogging. The SCE interconnection portal is limited in what can be filed on it, so much of the information from the prior application was attached to the single line, so SCE had a complete record in this application without having to reference the prior application.

System Load Justification

A new NEM project can only be sized to provide up to 100 percent of recorded usage and the application requires a Load Justification form be provided with the application. Because this well was agricultural well with erratic usage, a history of electricity usage was provided. The solar generation was significantly less than any recorded usage.

Plot Plan

A plot plan is required for all NEM applications. This plot plan was “unstandard” as all the land in the area is owned by the water bank but was accepted as adequate for the application.

WELL ISSUES DISCUSSION

Gaskell and 152nd Well



Figure 4. Well at Gaskell and 152nd

This well was originally selected to be the 50kW project demonstration site for APH. The SCE Interconnection application (NST-206659) was submitted in November 2021.

SCE performed well tests on the WSWB wells in October and November of 2021. These tests (Table 2) found some results for the Gaskell/152nd (G152) well that were worrisome. Historically this well had produced about 1,200 gallon per minute (gpm) but that production level had dropped to between 919 and 819 gpm. Especially worrisome was the drawdown of between 111 and 125 feet. This meant that the well was pumping water out faster than the water could enter the well casing.



Figure 5. Biofouling with some open casing perforations at 414 ft deep



Figure 6. Completely blocked casing perforations at 540 ft deep.

Rehabilitation of the well would include mechanically cleaning the casing, acidifying the well with phosphoric acid and swabbing it out, and purging the well to try and remove accumulated sediment. The cost of this rehabilitation would be several hundred thousand dollars with no guarantee of success – the biofouling on the well casing usually indicates that gravel pack and

formation on the outside of the casing is also plugged and simply cleaning the well casing will not solve the problem

The Interconnection application (NST-206659) for this well was approved by SCE on March 22, 2022. We notified SCE that we were not going to use this well for the APH demonstration project due to biofouling issue and needed to switch to an adjacent well.

Gaskell and 160thSE Well



Figure 7. Well at Gaskell and 160thSE

The well just around the corner (Gaskell and 160thSE) from the original fouled well was selected for the replacement demonstration project. It is a slightly smaller well (200 hp versus 250 hp) but there was no indication of any issues with this well from the pump tests (Table 2). The interconnection application (NST-290291) was submitted in early July 2022.

Pulling the well (removing all the well pipe in the well hole) and installing the APH valve below the pump impellers (Figure 8) and then reinstalling the pipe down the well hole was scheduled August 30-September 2, 2022. We immediately ran into two problems.



Figure 8. Pump Bowls and Impellers

Patch

The well pipe hung up pulling it out of the well hole. While the drilling crew was able to pull the pipe out but we had to find out what the pipe caught on, so a well video log was conducted. At about 353 ft down there was a perforation in the well column that had been patched (basically

taking a sheet of metal and pressing it up against the sides of the well column²⁰) and the patch had deteriorated, resulting in a very rough internal surface to the well column (Figure 9).



Figure 9. Patch and Obtrusions at 353 Ft.

This was a serious problem. The APH valve at the bottom of the well operates using hydraulic tubing running down the side of the well pipes (Figure 10), and the protrusions at 553 ft would chafe and eventually sever the tubing, rendering the APH valve inoperable.

²⁰ Perforations in the well column allow sand and small gravel bits into the well when it is being pumped, resulting in significantly increased wear and tear on the pumping equipment and eventual clogging the well.



Figure 10. APH Valve Hydraulic Hoses on Exterior of Well Pipe

Severe Rust on Pipes

The second issue we ran into was severe rusting on some of the column pipes. The interior of some of the pipes was as bad or worse than the rusting shown in Figure 11. This was another concern. The pulsing of water in the well (pumping it out and then reinjecting it) would dislodge large areas of scale and rust on the pipes and clog the APH valve and can get trapped in the pump impellers and ruin them. The scaling can increase pipe friction and reduce the efficiency of the energy storage.



Figure 11. Severe Rusting on Well Pipes

The Solution

There was enough good pipe available that it was decided to install the APH valve (Figure 12) at a depth of above 350 ft, above where the torn patch was in the well²¹, and include a screen (Figure 13) above the valve to catch any debris that would fall through the pipes before it entered the APH valve. The APH valve was installed at the bottom of the well piping (Figure 14).



Figure 12. APH Valve



Figure 13. Screen above APH Valve

²¹ This level was still below the standing water level minus the recorded draw down, so APH should continue to work.



Figure 14. APH Valve Installed at Bottom of Pipe Column

The well at Gaskell and 160thSE installation with the APH valve was completed on September 6th and all the components tested out working correctly.

**Appendix A: REPORT ON OPTIONS FOR SALE OF POWER FROM AQUIFER PUMPED HYDRO:
Comparison of Available Options Net Energy Metering (NEM), Renewable Energy Selfgeneration Bill
Credit Transfer (RES-BCT), Qualifying Facility (QF), and Renewable Market Adjusting Tariff (ReMAT)**



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Contract # EPC19-058

Date: March 16, 2021

Note: the values in this report were current as of the date of the report. While the program descriptions are valid, the prices are constantly changing. Also, some of these programs have participation limits and may not be available in the future.

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SUMMARY

One of the decisions that has to be made prior to interconnecting with the utility grid is - where is the power generated by Aquifer Pumped Hydro (APH) going to go? That decision determines a number of important processes, including the interconnection approach. This report provides a review of the salient features of the current utility options for the APH power: Net Energy Metering (NEM) tariff option, Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT) tariff option, utility Qualifying Facility (QF) contract, and the Renewable Market Adjusting Tariff (ReMAT) contract. This report does not discuss utility or Community Choice Aggregations (CCAs) solicitations for generation and services.

Southern California Edison (SCE) is used by reference in this report, but all the other investor-owned utilities in California have similar programs under the same or similar names. Values provided here are representative of the prices available in March of 2021.

NEM allows customers who generate their own energy with approved renewable generators to serve their energy needs onsite and to receive full retail price credit on their electric bills for any surplus energy fed back to their utility. A threshold issue of this option is the generation can only be sized to meet the customer's onsite load. There is an option called NEM-A (Net Energy Metering Aggregation) that allows a single renewable generation project to credit several customer billing accounts, provided they are all on the same property or are contiguous or adjacent to the generating site all owned by the customer. The value of the electricity under this program changes with utility tariff changes. There are no performance requirements. Interconnection is via a Rule 21 non-export agreement.

The RES-BCT option allows government entities (only) to generate renewable electricity at one location and credit the electricity generated to other customer electrical accounts. Key points with this option are that you have to be a governmental entity. Customers only get the generation component of energy rates (not the full retail price) as the value of the credit. The value of the electricity under this program changes with utility tariff changes. There are no performance requirements. Interconnection is via a Rule 21 non-export agreement.

The QF option (officially called the Public Utilities Regulatory Policies Act [PURPA] Standard Offer Contract) allows FERC (Federal Energy Regulatory Agency) certified QFs to sell power to the utility. Prices paid under this contract have two options: As-Executed Option (which fixes the prices for the contract term) and As-Delivered Option under which the price varies throughout the terms of the contract. Interconnection is via a Rule 21 or WDAT export contract.

The ReMAT option allows renewable energy generators to enter into a long term (up to 20 years) fixed price contract with the utility for the sale of electricity generated by the APH facilities. The REMAT price is fixed for the duration of the contract. There are performance requirements in the contract. Interconnection is via a Rule 21 or WDAT export contract

DISCUSSION

Summaries of the generation options, along with references and links, are provided in Attachments 1-4.

Threshold Issues

Table 1 provides a comparison of the threshold issue for each of the generation options.

For a NEM agreement the renewable generator can only be sized to provide 100 percent of the customers on-site load during the past year. RES-BCT agreements are limited to governmental entities. In order to get a QF contract the project has to be granted QF status by FERC. For a Re-MAT contract the generator has to sign up for a long-term contract (10-20 years).

Table 1. Threshold Issues for Generation Options for APH

	NEM	RES-BCT	QF	Re-MAT
Threshold Issue	Sufficient on-site load	Government entity	QF status	Long term contract

Characteristics

Table 2 provides a comparison of some of the characteristics of the various generation options.

Table 2. Summary of Generation Options for APH

	NEM	RES-BCT	QF	Re-MAT
Summary	Retail tariff credit for exported energy applied to energy used on-site	Credit at generation component of rates allocated to benefiting accounts	Fixed or variable price sale of generated energy	Fixed price contract for generated energy
Regulated by	CPUC	CPUC	FERC/ISO	FERC/ISO
Serve Site Demand First	Yes	Yes	Yes	Yes
Scheduling Required	No	No	Yes	Yes
ISO Resource Adequacy Determination	No	No	Yes	Yes
Demand Response Program Participation	Yes	Yes	No	No
Registration/Reporting	CEC and WREGIS	CEC and WREGIS	CEC and WREGIS	CEC and WREGIS
Price Determined By	Utility Retail Tariffs	Utility Retail Tariffs	Initial fixed or market prices	Contract Price
Arrangement	Tariff	Tariff	PPA	PPA
Price Changes	With Tariff Changes	With Tariff Changes	Fixed or Energy Prices Change Monthly	Fixed for Duration of Contract
Future Prices	Tariff Changes	Tariff Changes	Market Price changes	N/A
RECs Owned By	Customer	Customer	Utility	Utility
Duration	Can change annually	Can change annually	Depends upon contract signed	10-, 15-, or 20-Year Contract
Analysis	Exported energy credit vs. cost of purchasing energy	Exported energy credit vs. benefiting account energy value	Fixed or anticipated market prices	Value of exported energy

NEM

NEM is a program offered by the utilities that allows customers with eligible renewable distributed generation systems to “bank” excess generation. A bi-directional meter tracks the net difference (difference between consumption and generation). All electricity in excess of site load is recorded as a credit for the surplus electricity supplied to the electric grid. The credit is full retail electricity prices, minus nonbypassable charges for electricity consumed on-site. This credit will then be applied to the customers energy bill, to offset all or part of the costs associated with the energy consumed each month. There is an annual true-up, where excess generation credits are applied to past utility bills. Excess generation remaining after the annual true up is priced at Net Surplus Compensation rates.

This is a CPUC regulated program. Participation is via enrollment in a utility tariff. No scheduling is required, and participation in other utility programs (such as demand response) is allowed. Renewable Energy Credits (RECS) are owned by the customer. Prices change as utility rates change.

RES-BCT

RES-BCT is a program offered by the utilities that allows governmental customers with eligible renewable distributed generation systems to receive a generation credit for electricity exported to the grid. The generation credit is only the generation component of retail electricity prices (not full retail prices). The generation credit will be applied to up to 50 other customer accounts to offset the generation component of those accounts bills. There is no annual true-up, excess generation credits are donated to the utility.

This is a CPUC regulated program. Participation is via selection of a utility tariff. No scheduling is required, and participation in other programs (such as demand response) is allowed. RECS are owned by the customer. Prices change as utility rates change.

QF

QF contracts are regulated by the Federal Energy Regulatory Commission (FERC) and approved by the CPUC. This is a generation sale contract. Participation is via a standard Power Purchase Arrangement (PPA) with the utility. Prices paid under this contract have two options: As-Executed Option (which fixes the prices for the contract term) and As-Delivered Option under which the price varies throughout the terms of the contract based upon market prices.

No scheduling is required, and participation in other utility programs is not allowed. RECS are owned by the utility. Prices are fixed for contract duration (As-Executed) or change monthly (As-Delivered).

REMAT

REMAT contracts are regulated by the Federal Energy Regulatory Commission (FERC) and approved by the CPUC. This is a generation sale contract. Participation is via a standard Power Purchase Arrangement (PPA) with the utility. Prices paid under this contract are fixed for the duration of the contract.

Scheduling is required, and participation in other utility programs is not allowed. RECS are owned by the utility. Prices are fixed for contract duration.

APPENDIX 1. NEM (Net Energy Metering)

NEM Tariff: https://library.sce.com/content/dam/sce-doelib/public/regulatory/tariff/electric/schedules/other-rates/ELECTRIC_SCHEDULES_NEM-ST.pdf

SCE contacts: Residential: 866-701-7868, business: 866-701-7869

Background

The current NEM (NEM 2.0) program was adopted by the CPUC in Decision 16-01-044 on January 28, 2016 and is available to customers of PG&E, SCE, and SDG&E. There is a new NEM proceeding – the NEM Revisit Rulemaking (R.20-08-020) that is likely to change the parameters of the NEM program. The CPUC released a white paper on January 28, 2021 on potential successors to the current program. A workshop on the white paper was held on February 8, 2021. Changes to the NEM program can be expected in 2021.

General Summary

NEM allows customers who generate their own energy with approved renewable generators to serve their energy needs directly onsite and to receive a financial credit on their electric bills for any surplus energy fed back to their utility. The utility tariff for this program is NEM-ST.

Pricing

Generation credits are determined by multiplying the exported kWh (generation in excess of site load) by the applicable utility rates. The generation credits are applied to site bill each month, and, at the end of the year, excess generation credits are carried over to future months. There is an annual true-up of all energy charges and credits.

Non-Bypassable Charges (NBCs)

NBCs are composed of the following rate components: (1) Public Purpose Programs Charge (PPPC), (2) Nuclear Decommissioning Charge (NDC), (3) Competition Transition Charge (CTC), and (4) Department of Water Resources (DWR) Bond Charge. They are charged to for each kWh of electricity that is consumed/imported from the grid net of exports (i.e., net consumption) in each metered interval.

Net Surplus Compensation

If, at the end of the true-up period, there are still generation credits available, they are priced at the Net Surplus Compensation (NSC) rate and can be credited to future utility charges or remanded via a utility check. The NSC rate is based on a 12-month rolling average of the market rate for energy.

NEM customers may also receive compensation for the renewable energy credits (RECs) associated with this excess generation. To receive compensation, a customer-generator must register their generation facility with the Western Renewable Energy Generation Information System (WREGIS) and follow the eligibility guidelines.

NEM-A

Customers who have additional metered service accounts located on property where the Generating Facility is located and/or on property adjacent or contiguous to the property on which the Generating Facility is located, if those properties are all solely owned, leased, or rented by the Customer, may choose to have the electrical load (kWh) served by such meters aggregated for the purposes of determining if the Customer is a net consumer or a net producer of energy.

APPENDIX 2. RES-BCT (Renewable Energy Self-Generation Bill Credit Transfer)

Tariff: https://library.sce.com/content/dam/sce-doclib/public/regulatory/tariff/electric/schedules/other-rates/ELECTRIC_SCHEDULES_RES-BCT.pdf

Background

The virtual net metering option for governmental agencies renewable projects has been in existence for several years, having been established by AB2466 in 2008. This program enables local governments to share generation credits from a system located on one government-owned property with billing accounts at other government-owned properties. The system size limit under RES-BCT is 5 MW.

General Summary

SCE Schedule RES-BCT is the applicable tariff. This schedule is only available to governmental entities. It allows the construction of a renewable generator that produces more than site load and allows the excess generation to be credited to other customer accounts.

Pricing

Generation credits are determined by multiplying the exported kWh (generation in excess of site load) by the applicable utility generation rate component for each hour. This is only a portion of full retail costs. The generator will generate bill credits calculated by multiplying the Generating Account's time-of-use generation component (energy charge) of the electricity rate by the amount of energy exported to the grid (kWh) during the corresponding time period. These bill credits can then be applied to offset generation costs at the customer's other utility service accounts (Benefiting Accounts) at different facilities (up to 50 other accounts).

Customer may select one or more accounts (known as "Benefiting Accounts") to which the bill credits will be applied. There has to be enough of the generating component of the Benefiting Accounts to absorb all the generating credits generated. Any remaining bill credits at the Benefiting Account are carried over to the following month, but at the end of a 12-month period any unused credits are set to zero (donated to the utility).

Considerations

The key considerations of RES-BCT are: 1) the generating credit for a portion of retail rates under RES-BCT is only the energy portion of the generating account (not full retail costs), 2) the customer has to have enough Benefiting Accounts to absorb all the Generating Account credits produced, 3) these rates will change in the future as utility rates change, 4) there is no long term agreement under RES-BCT - you can always switch to another tariff or, if you wish, enter into a contract to sell the power to the utility or another purchaser, 5) the customer will retain ownership of the green (renewable) attributes of the electricity – the customer can use them or sell them to some other willing buyer, 6) there is no scheduling requirement.

**APPENDIX 3. QF (Qualifying Facility)
Public Utilities Regulatory Policies Acts (PURPA) Standard Offer Contract**

Contract: <https://www.sce.com/procurement/solicitations/purpa-soc>

SCE Contacts: Charles Diep (626-302-2787) Charles.Diep@sce.com, Denise Lee (626-261-0112) Denise.Lee@sce.com

Background

On May 15, 2020, the California Public Utilities Commission (CPUC) issued Decision (D.) 20-05-006 (the “Decision”), which among several requirements, ordered the investor-owned utilities (IOUs) to create a new standard offer contract for qualifying facilities (QFs) of 20 megawatts (MW) or less, with new price terms, to replace the existing QF contract.

Pricing

Prices paid under this contract have two options: As-Executed Option (which fixes the prices for the contract term) and As-Delivered Option under which the price varies throughout the terms of the contract. These two options are described below.

Option	New QF SOC – Pricing Option	Energy Price	Capacity Price
1 As-Executed Option	Seller elects pricing fixed at time of contract execution	<ul style="list-style-type: none"> • 3-year average of publicly available CAISO locational marginal prices for the PNode specific to QF • Calculated on a monthly basis with periods based on the Commissioner's most recently approved standard time-of-use periods, and a collar based on prices at the relevant Energy Trading Hub 	<ul style="list-style-type: none"> • 5-year weighted average of publicly available resource adequacy prices • Shaped to time periods based on generation capacity allocation factors adopted by the Commission and applied to updated time-of-use periods • 2.5% escalation factor for each year of the contract term after the last year included in the average • A capacity price is based on the provision of Resource Adequacy.
2 As-Delivered Option	Seller elects pricing at time of delivery	<ul style="list-style-type: none"> • Locational marginal pricing from CAISO's day-ahead market for the node specific to a QF 	<ul style="list-style-type: none"> • Same methodology used for capacity price at time of execution (above) • Price recalculated annually based on changes in the cost of RA and/or capacity allocation factors, and time-of-use periods

As-Executed Option

The current (March 2021) As-Executed capacity and energy prices are provided in the following tables.

As-Executed Option Capacity Prices Monthly

Term Year	Monthly RA Capacity Price (\$/kW-month) ²	Annual RA Capacity Price (\$/kW-year)	Annual Price Escalation Factor ³
1	\$3.09	\$37.08	1.000
2	\$3.09	\$37.08	1.000
3	\$3.09	\$37.08	1.000
4	\$3.17	\$38.01	1.025
5	\$3.25	\$38.96	1.051
6	\$3.33	\$39.93	1.077
7	\$3.41	\$40.93	1.104
8	\$3.50	\$41.95	1.131
9	\$3.58	\$43.00	1.160
10	\$3.67	\$44.08	1.189
11	\$3.76	\$45.18	1.218
12	\$3.86	\$46.31	1.249

As Executed Option Hourly Capacity Prices

Month	1 - On-Peak (\$/MWh)	2 - Mid-Peak (\$/MWh)	3 - Off-Peak (\$/MWh)	4 - Super-Off-Peak (\$/MWh)
Jan	NA	\$4.33	\$0.12	\$0.11
Feb	NA	\$4.33	\$0.12	\$0.11
Mar	NA	\$4.33	\$0.12	\$0.11
Apr	NA	\$4.33	\$0.12	\$0.11
May	NA	\$4.33	\$0.12	\$0.11
Jun	\$61.10	\$26.27	\$0.04	NA
Jul	\$61.10	\$26.27	\$0.04	NA
Aug	\$61.10	\$26.27	\$0.04	NA
Sep	\$61.10	\$26.27	\$0.04	NA
Oct	NA	\$4.33	\$0.12	\$0.11
Nov	NA	\$4.33	\$0.12	\$0.11
Dec	NA	\$4.33	\$0.12	\$0.11

It should be noted that capacity payments require a RA (Resource Adequacy) designation by the California ISO.

As-Executed Time-of-Delivery Energy Prices

Month	1 On-Peak (\$/MWh)			2 Mid-Peak (\$/MWh)			3 Off-Peak (\$/MWh)			4 Super-Off-Peak (\$/MWh)		
	+10%	SP15	-10%	+10%	SP15	-10%	+10%	SP15	-10%	+10%	SP15	-10%
Jan	N/A	N/A	N/A	\$51.60	\$46.91	\$42.22	\$38.25	\$34.77	\$31.29	\$28.35	\$25.77	\$23.19
Feb	N/A	N/A	N/A	\$67.47	\$61.34	\$55.21	\$51.51	\$46.83	\$42.15	\$29.74	\$27.04	\$24.34
Mar	N/A	N/A	N/A	\$46.50	\$42.27	\$38.04	\$37.52	\$34.11	\$30.70	\$20.05	\$18.23	\$16.41
Apr	N/A	N/A	N/A	\$37.06	\$33.69	\$30.32	\$28.72	\$26.11	\$23.50	\$10.98	\$9.98	\$8.98
May	N/A	N/A	N/A	\$33.77	\$30.70	\$27.63	\$23.62	\$21.47	\$19.32	\$9.49	\$8.63	\$7.77
Jun	\$45.50	\$41.36	\$37.22	\$34.51	\$31.37	\$28.23	\$22.91	\$20.83	\$18.75	N/A	N/A	N/A
Jul	\$101.59	\$92.35	\$83.12	\$66.33	\$60.30	\$54.27	\$38.46	\$34.96	\$31.46	N/A	N/A	N/A
Aug	\$162.78	\$147.98	\$133.18	\$92.49	\$84.08	\$75.67	\$45.73	\$41.57	\$37.41	N/A	N/A	N/A
Sep	\$70.39	\$63.99	\$57.59	\$78.83	\$71.66	\$64.49	\$34.29	\$31.17	\$28.05	N/A	N/A	N/A
Oct	N/A	N/A	N/A	\$68.85	\$62.59	\$56.33	\$40.71	\$37.01	\$33.31	\$28.00	\$25.45	\$22.91
Nov	N/A	N/A	N/A	\$71.17	\$64.70	\$58.23	\$46.40	\$42.18	\$37.96	\$35.12	\$31.93	\$28.74
Dec	N/A	N/A	N/A	\$67.77	\$61.61	\$55.45	\$47.25	\$42.95	\$38.66	\$37.73	\$34.30	\$30.87

As-Delivered Option

For As-Delivered Option the Hourly Capacity Prices set forth in the As Executed Capacity Prices table above would apply for deliveries during this month. There will be no Annual Price Escalation Factor applied to these values. The Hourly Capacity Prices will be recalculated annually based on changes in the cost of resource adequacy and/or capacity allocation factors, and time-of-use factors:

$$\text{RA Capacity Payment} = \text{sum for all hours (exported energy} \times \text{Hourly Capacity Price)}$$

The Energy Price for contracts using the As-Delivered Option will be the locational marginal prices from the California Independent System Operator’s day-ahead market for the pricing node (PNode) specific to the qualifying facility:

$$\text{Energy Payment} = \text{sum for all hours (exported energy} \times \text{Day-Ahead ISO price)}$$

Time of Delivery

The time-of-Delivery periods are identical for both the As-Executed and As-Delivered contract options.

TOD Period	Weekdays		Weekends & Holidays ⁵	
	Summer ⁶ (Jun – Sep)	Winter (Oct – May)	Summer (Jun – Sep)	Winter (Oct – May)
1 – On-Peak	4 pm – 9 pm	N/A	N/A	N/A
2 – Mid-Peak	N/A	4 pm – 9 pm	4 pm – 9 pm	4 pm – 9 pm
3 – Off-Peak	All hours except 4 pm – 9 pm	9 pm – 8 am	All hours except 4 pm – 9 pm	9 pm – 8 am
4 – Super-Off Peak	N/A	8 am – 4 pm	N/A	8 am – 4 pm

Performance Requirement

There is no performance requirement with this contract.

Monthly Scheduling Fee

SCE charges a monthly scheduling fee of \$2,500 per month.

APPENDIX 4. ReMAT (Renewable Market Adjusting Tariff)

Tariff: https://library.sce.com/content/dam/sce-doclib/public/regulatory/tariff/electric/schedules/other-rates/ELECTRIC_SCHEDULES_ReMAT.pdf

Contract: https://library.sce.com/content/dam/sce-doclib/public/regulatory/tariff/electric/forms/other-agreements/ELECTRIC_FORMS_14-934.pdf

SCE Contacts: Wen Liao (262-302-7294) Wen.Liao@sce.com, Charles Vaughan (626-302-1033) Charles.Vaughan@sce.com

Application: <https://sceremat.accionpower.com/ReMAT/home.asp>

Background

SCE originally launched the ReMAT program on July 24, 2013. As a result of a lawsuit brought by a solar developer (Case 3:13-cv-04934-JD (N.D. Cal.)), the U.S. District Court held that the ReMAT program violates federal law with regards to the price paid qualifying facilities for their generation and ordered the immediate suspension of any new ReMAT contracts (December 6, 2017).

On January 22, 2021, the CPUC approved (1) the Advice Letter (“AL”) 4331-E and AL 4331-E-A filed by SCE that presented modifications to the Re-MAT tariff and power purchase agreement pursuant to D. 20-10-005, which authorized the re-launch of the Re-MAT program, and (2) other pending advice letters (AL 3660-E and AL 3660-E-A) filed by SCE for the Re-MAT program and the ReMAT program was reinitiated in February of 2021.

The Renewable Market Adjusting Tariff (ReMAT) is a feed-in tariff program for small renewable generators less than 3 MW in size

Product Types & Pricing

There are three Product Types: As-Available Peaking, As-Available Non-Peaking, and Baseload.

The Contract Price varies between these product types.

Product Type	Contract Price
As-Available Non-Peaking	\$57.40/MWh
As-Available Peaking	\$52.34/MWh
Baseload	\$73.50 /MWh

As-available generation is generation from wind, solar, or hydro.

These prices are time differentiated according to predetermined allocation factors. The time-of-use prices for As-Available Non-Peaking generation are shown below.

	ReMAT				
	Base Price	Allocation Factor	Total Rate (\$/kWh)		
Energy Charge				TOU Periods	
<u>Summer Season</u>				<u>Jun 1 - Sep 30</u>	
On-Peak	\$0.05740	1.18	\$0.06773	4 - 9 p.m.	Weekdays
Mid-peak	\$0.05740	1.13	\$0.06486	4 - 9 p.m.	Weekends, Holidays
Off-Peak	\$0.05740	0.95	\$0.05453	All other	Weekday, Weekends, Holidays
<u>Winter Season</u>				<u>Oct 1 -May 31</u>	
Mid-peak	\$0.05740	1.25	\$0.07175	4 - 9 p.m.	Weekdays, Weekends, Holidays
Off-Peak	\$0.05740	1.39	\$0.07979	9 p.m - 8 a.m.	Weekdays, Weekends, Holidays
Super-Off-Peak	\$0.05740	0.32	\$0.01837	8 a.m. - 4 p.m.	Weekdays, Weekends, Holidays

Contract Terms

Contract terms of 10, 15, or 20 years.

Performance Requirement

Delivery of the annual contracted quantity of generation is required.

Program Limit

SCE currently (March 2021) has the following program capacity remaining for each product type:

- As-Available Peaking – 4.82 MW
- As-Available Non-Peaking – 35.20 MW
- Baseload – 39.66 MW.

Appendix B. Pre-Interconnection Report Request



Southern California Edison
Rosemead, California (U 338-E)

Revised Cal. PUC Sheet No. 59777-E
Cancelling Original Cal. PUC Sheet No. 54880-E

Sheet 1

RULE 21 PRE-APPLICATION REPORT REQUEST

Form 14-922

(To be inserted by utility)

Advice 3429-E
Decision 16-06-052

Issued by
Caroline Choi
Senior Vice President

(To be inserted by Cal. PUC)

Date Filed Jul 8, 2016
Effective Jul 8, 2016
Resolution _____

RULE 21 PRE-APPLICATION REPORT REQUEST

1. GENERAL INTENT, CLARIFICATION AND OBLIGATION

(N)

- A. Upon receipt of a completed Pre-Application Report Request, the applicable non-refundable processing fee and Authorization to Receive Customer Information or Act on a Customer's Behalf, Form 14-796, if applicable, Distribution Provider shall provide pre-application data for the Pre-Application Report package selected by Applicant and within the corresponding timeframe.
- B. The Pre-Application Report is based on readily available pre-existing system data at the time of request.
- C. A Pre-Application Report Request does not obligate Distribution Provider to conduct a study or other analysis of the proposed project.
- D. A Pre-Application Report Request does not obligate Distribution Provider to provide a response for data that is not readily available.
- E. If Distribution Provider cannot complete all or some of the data fields in a Standard Pre-Application Report due to lack of available data, Distribution Provider will provide Applicant with a Pre-Application Report package that includes the data that is available.
- F. In requesting a Pre-Application Report, Applicant understands that:
 - (1) The existence of "Available Capacity" in no way implies that an interconnection up to this level may be completed without system impacts since there are many variables studied as part of the interconnection review process.
 - (2) The Distribution System is dynamic and subject to change.
 - (3) Data provided in the Pre-Application Report may become outdated and not useful at the time of submission of Applicant's Interconnection Request.
 - (4) Data included in the Pre-Application Report may be subject to confidentiality requirements and may only be released to Distribution Operator's customer of record or authorized representative.
 - (5) Notwithstanding any of the provisions of this Section, Distribution Provider shall, in good faith, provide a Pre-Application Report containing data that represents the best available information at the time of reporting.
 - (6) A Pre-Application Report Request may include various sets of data, and as such:
 - a. Data sets included in each Pre-Application Report package are fixed options as described in Section 2.
 - b. Each Pre-Application Report package has an associated cost as shown in Section 2.
 - c. Each Pre-Application Report package has a corresponding timeframe for Distribution Provider to complete the Pre-Application Report selected by Applicant.
 - d. A second request for additional data for the same interconnection project will be treated as a new Pre-Application Report Request.

(N)

2. OPTIONAL STANDARD AND ENHANCED PRE-APPLICATION REPORTS

(N)

Applicant may request one or a combination of the following Pre-Application Report packages:

- Standard Pre-Application Report – Provides a readily available level of Distribution System data that requires little to no analysis on the part of distribution engineer providing the report.
- Enhanced Pre-Application Report - Primary Service Package – Provides a detailed level of Distribution System data that requires analysis on the part of the distribution engineer providing the report.
- Enhanced Pre-Application Report - Behind the Meter Interconnection Package – Provides distribution system level data that is relevant to a “Behind the Meter” interconnection, as well as Secondary or Primary service characteristics that are confirmed in the field.

Because the Enhanced Pre-Application Report Request is for data incremental to the Standard Pre-Application Report Request, an Applicant submitting an Enhanced Pre-Application Report Request shall concurrently submit a Standard Pre-Application Report Request. Requests that exclude the Standard Pre-Application Report and select one or both of the Enhanced Pre-Application Report packages shall be assessed an additional non-refundable fee of \$100 to account for processing.

A. Standard Pre-Application Report Package

Data Included	Cost	Time
<ol style="list-style-type: none"> 1. Total capacity (MW) of substation/area bus or bank and of circuit likely to serve the proposed site. 2. Allocated capacity (MW) of substation/area bus or bank and circuit likely to serve proposed site. 3. Queued capacity (MW) of substation/area bus or bank and circuit likely to serve proposed site. 4. Available capacity (MW) of substation/area bus or bank and circuit most likely to serve proposed site. 5. Substation nominal distribution voltage or transmission nominal voltage if applicable. 6. Nominal distribution circuit voltage at the proposed site. 7. Approximate circuit distance between the proposed site and the substation. 8. Relevant line Section(s) peak load estimate, and minimum load, when available. 9. Number of protective devices and number of voltage regulating devices between the proposed site and the substation/area. 10. Whether or not three-phase power is available at the site. 11. Limiting conductor rating from proposed Point of Interconnection to distribution substation. 12. Based on proposed Point of Interconnection, existing or known constraints such as, but not limited to, electrical dependencies at that location, short circuit interrupting capacity issues, power quality or stability issues on the circuit, capacity constraints, or secondary networks. 13. Nominal Distribution circuit voltage and wiring configuration 	\$300	<p>Within 10 Business Days of receipt of pre-application report request.</p> <p>(Timeline is 30 Business Days if requested with Behind the Meter Interconnection Package)</p>

(N)

B. Enhance Pre-Application Report - Primary Service Package

Data Included	Cost	Time
Nominal Distribution circuit voltage and wiring configuration 1. Relevant line section(s) absolute minimum load, and minimum load during the 10 AM – 4 PM period (provided when SCADA data is available). 2. Existing upstream protection including: a. Device type (Fuse Breaker, Recloser) b. Device controller (device make/model ex: 50E/50T) c. Phase settings [IEEE Curve, Lever, Min Trip (A), Inst Trip(A)] d. Ground settings [IEEE Curve, Lever, Min Trip (A), Inst Trip(A)] e. Rated continuous current f. Short Circuit interrupting capability g. Confirm if the device is capable of bi-directional operation 3. Provide the Available Fault Current at the proposed point of interconnection including any existing distributed generation fault contribution.	\$225	Within 10 Business Days of receipt of pre-application report request. (Timeline is 30 Business Days if requested with Behind the Meter Interconnection Package)

C. Enhanced Pre-Application Report – Behind the Meter Interconnection Package¹

Data Included	Cost	Time
1. Relevant line section(s) absolute minimum load, and minimum load during the 10 AM – 4 PM period (provided when SCADA data is available) 2. Transformer data a. Existing service transformer kVA rating b. Primary Voltage and Secondary Voltage rating c. Configuration on both Primary and Secondary Side (i.e., Delta, Wye, Grounded Wye, etc.) d. Characteristic impedance (%Z) e. Confirm if the transformer is serving only one customer or multiple customers f. Provide the Available Fault Current on both the Primary and Secondary Side 3. Secondary Service Characteristics a. Conductor type (AL or CU) and size (AWG) b. Conductor insulation type c. Number of parallel runs d. Confirm if the existing secondary service is 3-wire or 4-wire. 4. Primary Service Characteristics a. Conductor type (AL or CU) and size (AWG) b. Conductor insulation type c. Number of parallel runs d. Confirm if the existing primary service is 3-wire or 4-wire.	\$800	Within 30 Business Days of receipt of pre-application report request

¹ Customer authorization will be required for release of customer specific information by submittal of Authorization to Receive Customer Information or Act on a Customer’s Behalf, Form 14-796. If customer authorization is required, Distribution Provider will notify Applicant if additional processing time will be required.

(N)

(N)

(N)
|
(N)

3. PRE-APPLICATION REQUESTED SERVICE

(N)

Report Name	Processing Time (Business Days)	Selection	Application Fee
Standard Pre-Application Report	10 ²	<input type="checkbox"/>	\$300
Enhanced Pre-Application Report – Primary Service Package	10 ³	<input type="checkbox"/>	\$225
Enhanced Pre-Application Report – Behind the Meter Package	30	<input type="checkbox"/>	\$800
Combined Enhanced Pre-Application Report - Primary Service and Behind the Meter Interconnection Packages	30	<input type="checkbox"/>	\$1,025
Processing Fee if Standard Pre-Application Report Request is not submitted with either Enhanced Pre-Application Report Packages ⁴	N/A	<input type="checkbox"/>	\$100
Total Pre-Application Report Request Fee			

4. PROJECT INFORMATION

A. Project Type

This Pre-Application Report Request is for (check only one):

- A proposed new Generating Facility.
- An increase in the generating capacity or a Material Modification of an existing Generating Facility.

This Pre-Application Report Request is for (check only one):

- A project that **will export** power to the SCE system.
- A project that **will not export** power to the SCE system.

B. Applicant provides the following information (when available):

Approximate proposed Point of Interconnection. The proposed Point of (N)

² Timeline is 30 Business Days if requested with Behind the Meter Interconnection Package (N)

³ Timeline is 30 Business Days if requested with Behind the Meter Interconnection Package (N)

⁴ The Enhanced Pre-Application Report Request shall be submitted in parallel with the Standard Pre-Application Report. Requests that exclude the Standard Pre-Application Report and select only one or both of the Enhanced Pre-Application Report packages shall be assessed an additional non-refundable fee of \$100 (N)

Interconnection shall be defined by latitude and longitude, site map, street address, utility equipment number (e.g. pole number), meter number, account number or some combination of the above sufficient to clearly identify the location of the Point of Interconnection. In the case of an existing Generating Facility, the name and specific location, including the county, of the existing Generating Facility. When requesting the Behind the Meter Interconnection Package, request must include meter number and account number ;

Project Name: _____

Project Location: _____

Street Address: _____

City: _____

County: _____

Zip Code: _____

Latitude (in degrees/minutes/seconds OR 6 decimal places): _____

Longitude (in degrees/minutes/seconds OR 6 decimal places): _____

Utility Equipment Number [nearest one (ex. pole number 1234567E, transformer number P1234567)]: _____

Meter Number⁵ (ex. V123N-456789): _____

Account Number⁵ (ex. 123456789): _____

Proposed Nominal Service Voltage and Configuration: _____
(Examples: 240V 3-wire 1Ø, 480V 4-wire 3Ø, 12kV 3-wire 1Ø, etc.)

- C. Attach copy of site map for proposed project. Site map should show:
- True north
 - Proposed project location, including general area of project
 - Proposed service point location
 - Major roads, streets and/or highways

ATTACHED:

Gaskell & 152 TT 2020Oct5 - General Site Map
SCE DRPEP Data - DRPEP Site Plus RAM Circuit Information
Rule 21 PAR Request Invoice - WSWB APH-1

⁵ Information required for Behind the Meter Interconnection Package

D. Generation Technology

(N)

Combustion Engine Generation

Type	Size (Total kW)	Fuel Type (N-Gas, Diesel, Biogas)
<input type="checkbox"/> Reciprocating Engine		
<input type="checkbox"/> Gas Turbine		
<input type="checkbox"/> Other (Specify)		

Inverter Based Generation

Type	Size (Total kW)	Fuel Type (N-Gas, Diesel, Biogas)
<input type="checkbox"/> Photovoltaic		N/A
<input type="checkbox"/> Battery		N/A
<input type="checkbox"/> Fuel Cell		
<input type="checkbox"/> Other (Specify)		

Other Generation

Type	Size (Total kW)	Fuel Type (N-Gas, Diesel, Biogas)
<input type="checkbox"/> Wind		N/A
<input type="checkbox"/> Steam Turbine		N/A
<input type="checkbox"/> Hydro Turbine	50	N/A
<input type="checkbox"/> Other (Specify)		

(N)

5. OTHER INFORMATION

(N)

Name, address, telephone number, and e-mail address of Applicant (primary person who will be contacted);

Name: Lon House

Title: _____

Company Name: Water and Energy Consulting

Street Address: _____

City, State: _____

Zip Code: _____

Phone Number: _____

Fax Number: _____

Email Address: _____

Non-Refundable application fee, as specified in SCE's Rule 21 tariff and Sections 2 and 3 above, is required to complete this Pre-Application Report Request.

Receipt Attached

This Pre-Application Report Request and the processing fee shall be submitted either **electronically** or in hard copy form with attachments to:

Grid Interconnection & Contract Development
Southern California Edison Company
2244 Walnut Grove Avenue
PO Box 945
Rosemead, CA 91770
Email: rule21@sce.com
Phone: (626) 302-3688

(N)

I understand that the contents of the Pre-Application Report are confidential and shall not be disclosed to anyone who is not an employee or other representative (including consultants) of the company or corporation I am employed with. (N)

This Pre-Application Report Request is submitted by:

Legal name of applicant: _____

By (signature): _____

Name (type or print): _____

Title: _____

Date: _____

Phone Number: _____ (N)

Appendix C. Pre-Interconnection Report

RULE 21

Pre-Application Report¹

Water and Energy Consulting **“WSWB APH-1” Project**

Location of Proposed Project:

Gaskell & 152nd St W
Rosamond, California 93560
Lat/Long: 34°50'01.6"N 118°24'00.2"W



SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONALSM Company

SOUTHERN CALIFORNIA EDISON COMPANY

Prepared by:
Chintan Varia

12/17/2020

¹ *Preliminary Report is pursuant to CPUC's Rule 21.* The Pre-Application Report need only include pre-existing data. A Pre-Application Report request does not obligate Distribution Provider to conduct a study or other analysis of the proposed project in the event that data is not available.

BACKGROUND

Water and Energy Consulting submitted a Pre-Application Report Request to Southern California Edison (“SCE”) under the terms of CPUC’s Rule 21. Water and Energy Consulting is requesting information at a site located on 34°50'01.6"N 118°24'00.2"W.



TERMS AND CONDITIONS OF PRE-APPLICATION REPORT

The Pre-Application Report need only include pre-existing data. A Pre-Application Report request does not obligate SCE to conduct a study or other analysis of the proposed project in the event that data is not available. If SCE cannot complete all or some of a Pre-Application Report due to lack of available data, SCE will provide applicant with a Pre-Application Report that includes the information that is available.

In requesting a Pre-Application Report, applicant understands that 1) the existence of “Available Capacity” in no way implies that an interconnection up to this level may be completed without impacts since there are many variables studied as part of the interconnection review process, 2) the distribution system is dynamic and subject to change and 3) data provided in the Pre-Application Report may become outdated and not useful at the time of submission of the complete Interconnection Request.

FINDINGS

Location Information

SCE Interconnection Map Substation Identifier– **689**

SCE Interconnection Map Circuit Identifier– **05420**

The link below references the DRPEP map that provides the above Distribution Substation and Circuit to the requested information: This link is subject to change in the near future.

<https://ltmdrpep.sce.com/drpep/>

The Pre-Application Report will include the following information if available:

- a. Total capacity (in megawatts (MW)) of substation/area bus, bank or circuit based on normal or operating ratings likely to serve the proposed Point of Interconnection.

Substation Total Capacity

The Capacity (MW) of substation is **28 MW**.

Circuit Total Capacity

The Total Capacity (MW) of the circuit is **10 MW**.

- b. Existing aggregate generation capacity, Allocated Capacity (in MW), interconnected to a substation/area bus, bank or circuit (i.e., amount of generation online) likely to serve the proposed Point of Interconnection.

Substation Allocated Capacity

The Allocated Capacity (MW) of substation is **9.3 MW**.

Circuit Allocated Capacity

The Allocated Capacity (MW) of Circuit is **0 MW**.

- c. Aggregate queued generation capacity, Queued Capacity (in MW), for a substation/area bus, bank or circuit (i.e., amount of generation in the queue) likely to serve the proposed Point of Interconnection.

Substation Queued Capacity

The Queued Capacity (MW) of substation is **0 MW**.

Circuit Queued Capacity

The Queued Capacity (MW) of circuit is **0 MW**.

- d. Available capacity (in MW) of substation/area bus or bank and circuit likely to serve the proposed Point of Interconnection (i.e., total capacity less the sum of existing aggregate generation capacity and aggregate queued generation capacity).

Substation Available Capacity

The Available Capacity (MW) of substation is **18.7 MW**.

Circuit Available Capacity

The Available Capacity (MW) of circuit is **0.1 MW**.

The Max Available Capacity (MW) of the Circuit is **10 MW**.

- e. Substation nominal distribution voltage or transmission nominal voltage if applicable.

Substation Nominal Distribution Voltage is **66/12 kV**.

- f. Nominal distribution circuit voltage at the proposed Point of Interconnection.

Circuit Nominal Distribution Voltage is **12 kV**.

- g. Approximate circuit distance between the Point of Interconnection and substation (or sub-transmission line)

The approximate distance from proposed site to the substation is approximately **10.2 miles**.

- h. Relevant line section(s) actual or estimated peak load and minimum load data, including daytime minimum load as described in GIP Section 6.11.1.1 below and absolute minimum load, when available.

Estimated peak line Section(s) load: **88 A**

Estimated minimum line Section(s) load: **0 A**

- i. Number and rating of protective devices and number and type (standard, bi-directional) of voltage regulating devices between the proposed Point of Interconnection and the substation/area. Identify whether the substation has a load tap changer.

There is **1** protection devices between the proposed site and the Substation. The device is a Remote Automatic Recloser.

- j. Number of phases available at the proposed Point of Interconnection. If a single phase, distance from the three-phase circuit.

There are **3** phases at the proposed Point of Interconnection.

- k. Limiting conductor rating from proposed Point of Interconnection to distribution substation.

The limiting conductor from the proposed Point of Interconnection to the distribution substation is: **336 ACSR, 605 A**

- l. Whether the Point of Interconnection is located on a spot network, grid network, or radial supply.

The Point of Interconnection is located on: **Radial Supply**

- m. Based on proposed Point of Interconnection, existing or known constraints such as, but not limited to, electrical dependencies at that location, short circuit interrupting capacity issues, power quality or stability issues on the circuit, capacity constraints or secondary networks.

The existing system configuration of the Antelope-Bailey Subtransmission System is currently networked via the tie lines Antelope-Neenach and Bailey and Neenach legs of Bailey-Neenach-Westpac 66 kV subtransmission lines which is a part of CAISO jurisdiction. The Antelope and Bailey 66kV busses are also a part of CAISO jurisdiction.

Previous studies have identified short circuit duty issues (SCD) on the Antelope 66 kV bus circuit breakers (CB). The proposed mitigation is to upgrade all breakers at the Antelope 66kV bus from 40kA to 50kA.

The proposed project is requesting interconnection on the Duntley 12 kV circuit served out of Neenach 66/12 kV Substation. A previous cluster study for the Antelope Subtransmission Study identified the following power flow contingency overloads:

- Loss of the Helijet-Little Rock-Palmdale-Rockair 66kV line caused about a 110% overload on the Little Rock segment of the Lancaster-Little Rock-Piute 66kV line
- Loss of the Lancaster-Little Rock-Piute 66 kV line caused about a 114% overload on the Little Rock segment of the Helijet-Little Rock-Palmdale-Rockair 66 kV line.

The identified mitigation for these contingency overloads was:

- Reconductoring approximately 2.0 miles of 4/0 ACSR and 6.1 miles of 2/0 CU of the Little Rock segment of the Lancaster-Little Rock-Piute 66 kV line
- Reconductoring 5.2 mile of 2/0 CU of the Little Rock segment of the Lancaster-Little Rock-Piute 66 kV line

Additionally, in previous charging studies, the 220/66 kV transformer A-banks in the Antelope Substation have shown thermal overloads during the loss of an A-bank. The addition of this Generating Facility could potentially contribute to the thermal overloads if this Generating Facility includes a battery storage technology, but further studies would be able to determine the likelihood and severity of the issue.

- n. Nominal distribution circuit voltage and wiring configuration.
Circuit Nominal Distribution Voltage: **12 kV**
Wiring configuration: **3 wire**

IMPORTANT TERMS

Total Capacity

The Total Capacity for the Substation and Circuit indicates the maximum amount of generation that can interconnect to this specific distribution substation and circuit. This assumes that sufficient system upgrades are in place, insufficient system conditions may result in high interconnection costs for the developer. The total capacity values accounts for all allocated and queued generation on the distribution substation and circuit.

Allocated Capacity

The amount of generation currently interconnected to that specific distribution substation and circuit.

Queued Capacity

The amount of generation requested to interconnect to that specific distribution substation and circuit in the future.

Available Capacity

The “Available Capacity” is the amount of generation that can interconnect to that specific distribution Substation and circuit that will likely have minimal impact to the system if no Subtransmission or transmission constraints exist. The “Available Capacity” value accounts for all allocated and queued generation on that distribution Substation and circuit. Locating a project in a region with enough “Available Capacity” increases the project’s potential for Fast Track eligibility (but does not guarantee Fast Track eligibility) and has the potential to minimize the developer’s interconnection costs to the SCE system.



Response to Letter of Request for Short Circuit Current Value for Panel Sizing and Protection Coordination

Disclaimer:

SCE provides the information contained in this letter on an “as is” basis without warranty of any kind, either express or implied. This disclaimer of liability applies to any claim or cause of action for damages or injuries occurring as a result of any error, omission, deletion or defect in the content of the information provided, including, but not limited to, negligence, breach of contract, or tort. Under no circumstances shall SCE or any of its parent or affiliate companies, employees, directors or shareholders be liable to any party for (i) any direct, indirect, special, punitive, incidental, exemplary, consequential, or any other damages arising in any way out of the availability, use or reliance on the information provided; or (ii) any claim attributable to errors, omissions or other inaccuracies in the information provided herein.

The values provided below are maximum Short Circuit values, based on current distribution system conditions. Utility distribution systems are dynamic, and the electrical characteristics of the system can vary significantly due to abnormal conditions, upgrades, modifications, and temporary or permanent reconfigurations. Therefore, the Short Circuit values provided above are subject to change frequently and without notice. SCE does not guarantee to hold the system parameters represented in this information constant. Consequently, SCE recommends that all electrical work on the service panel main breaker should be done in a de-energized condition to eliminate arc flash hazard at this location.

To: Customer: Lon House Phone: 530 409 9702
Address: 10645 N Oracle, Ste 121-216 Fax: 520 297 2643
City, Zip: Oro Valley, AZ 85737 Email: ionwhouse@gmail.com

From: Southern California Edison (SCE) - Engineering & Technical Services - Field Engineering

Engineer: Chintan Varia Phone: N/A
Address: 1 Innovation Way Fax: N/A
City, Zip: Pomona, CA, 91768 Email: chintan.varia@sce.com

Subject: Southern California Edison’s Contribution to Short Circuit Current at the Point-of-Connection of the SCE’s Service Conductors to the Customer’s Service Entrance Facilities (see disclaimer above)

Project: Name: WSWB APH-1
Address: Gaskell & 152nd St W
City, Zip: Rosamond, CA 93560
Structure #: 4778404E

- (1) The voltage and service configuration to be utilized for this project will be **480 volts 3 phase 4 wire**.
- (2) SCE's contribution to Short Circuit Current, **at the time of calculation**, On Primary is approximately **898 Amperes (3-phase)** and **453 Amperes (phase-ground)**. **The 3-phase X/R = 2 and the phase-ground X/R = 5**. On Secondary is approximately **8746 Amperes (3-phase)** and **10018 Amperes (phase-ground)**. **The 3-phase X/R = 4 and the phase-ground X/R = 8**
- (3) Line section(s) absolute minimum load **0 Amperes**, and minimum load during the 10 AM – 4PM period **0 Amperes**. (provided when SCADA data is available)
- (4) Transformer Data:
Existing service transformer rating: **225(3x75) kVA**, **1x3 phase**, **%Z = 5.32**
Configuration on both Primary and Secondary Side: **Delta/Wye-Grounded**
Primary Voltage rating: **12000 V** and Secondary Voltage rating: **277/480 V**
The transformer is serving only one customer.
- (5) Secondary Service Characteristics:
Service Conductors: 1 runs of 1/0 Quad Size (Al Cu)
Existing secondary service is **4-wire**.
- (6) Primary Service Characteristics
Primary Conductors: 1 runs of 336 ACSR Size (Al Cu)
Existing primary service is **3-wire**.

Appendix D. NEM Application Form 14-957

NET ENERGY METERING (NEM) GENERATING FACILITY INTERCONNECTION APPLICATION

APPLICABILITY

This Net Energy Metering (NEM) Generating Facility Interconnection Application (Application) is used to request the interconnection of a Renewable Electrical Generating Facility (Generating Facility) to Southern California Edison's (SCE) Distribution System over which the California Public Utilities Commission (CPUC or Commission) has jurisdiction for the purposes of receiving service under SCE's NEM tariffs, including rate schedules NEM and NEM-ST (including NEM Aggregation (NEM-A) and NEM-MT¹), MASH-VNM and MASH-VNM-ST, NEM-V and NEM-V-ST, FC-NEM, and SOMAH-VNM to offset part or all of the Customer's own electrical requirements. (T)

This document is solely an application. It does not authorize you to operate your Generating Facility in parallel with SCE's electric system. To ensure safety and grid reliability, you must not operate your Generating Facility in parallel with the Distribution System until SCE provides you with written Permission to Operate (PTO). Unauthorized Parallel Operation may be dangerous and may result in injury to persons and/or may cause damage to equipment and/or property for which the Customer may be liable.

GUIDELINES AND STEPS FOR INTERCONNECTION

This Application, along with any applicable payments, must be completed online and include all of the additional information indicated in the NEM Interconnection Handbook (see also Section 10 below) to initiate SCE's interconnection review of the proposed Generating Facility. Please refer to SCE's [Rule 21](#), the [NEM Interconnection Handbook](#) and SCE's [Electric Service Requirements](#) (ESRs) for more information regarding the interconnection of an NEM Generating Facility to SCE's Distribution System. **PURSUANT TO CPUC DECISION (D.)14-11-001, CERTAIN DATA PROVIDED ON THIS APPLICATION WILL BE TRANSFERRED TO A THIRD-PARTY FOR PROCESSING AND POSTING ON THE CALIFORNIA SOLAR STATISTICS WEBSITE. A LIST OF THE DATA THAT WILL BE SHARED CAN BE FOUND IN APPENDIX A OF D.14-11-001.** Applications submitted with blank fields (as applicable) will be deemed incomplete and will be returned to the main project contact for completion. The main project contact is also responsible for updating the Application should the information submitted change between system design and installation.

This Application must be accompanied by a Single Line Diagram (SLD) of the proposed system showing the Generating Facility components and the electrical path from the Generating Facility to SCE's meter. The SLD must clearly identify the point of interconnection (a sample SLD is available at <http://www.sce.com/nem>). Additional documentation may be required as outlined in Section 10 below. **A signed Interconnection Agreement and a copy of the final electrical inspection approval issued by the local jurisdictional authority are required before SCE will issue PTO, but may be submitted separately.** An Application Checklist and all required forms are available at <http://www.sce.com/nem>.

SCE normally provides PTO within 30 working days of receiving all necessary information, including but not limited to a completed Application, SLD, signed Interconnection Agreement and a copy of the final electrical inspection approval issued by the local jurisdictional authority. SCE will notify the Customer of Record (COR) if PTO cannot be issued within 30 working days of receiving all necessary information and will provide an estimate of the date that PTO is likely to be issued.

Please check this box to indicate acknowledgment of the information provided above.

¹ For NEM-MT interconnection requests seeking to interconnect a non-NEM generator behind the same SCE revenue meter / Point of Common Coupling as an existing NEM generator, Application Form 14-732 should be used in lieu of this Application.



NET ENERGY METERING (NEM) GENERATING FACILITY INTERCONNECTION APPLICATION

<i>For SCE Use Only</i>			
Project Name:	Project ID:	Date Application Received:	Application Expiration Date²:
Application Approval Date:		PTO Date:	Decommissioned Date:

² The information submitted in this Application will remain active and valid consistent with the timelines specified in SCE's Rule 21, including Section D.13 and Section F.

SECTION 1 – Customer and Contractor / Installer Information
A. Customer Electric Account and Contact Information
This is the electric service account that the Generating Facility will be interconnected to for Parallel Operation with SCE. The Customer Name and Service Account # listed below must match the account information on the Customer's SCE electric bill.

Please check the applicable Customer Sector box: Commercial			
<input type="checkbox"/> Residential	<input type="checkbox"/> Commercial	<input type="checkbox"/> Industrial	<input type="checkbox"/> Non-Profit
<input type="checkbox"/> Educational	<input type="checkbox"/> Military	<input type="checkbox"/> Other Government	

Please check the applicable Customer Type box: Bundled Service		
<input type="checkbox"/> Bundled Service (All services are provided by SCE)	<input type="checkbox"/> Direct Access (DA) (Certain services are provided by an Electric Service Provider)	<input type="checkbox"/> Community Choice Aggregation (CCA) / Community Aggregation (Certain services are provided by a Community Choice Aggregator or Community Aggregator)

8002087301	345M-001174	4,800 V
SCE Service Account #	Meter #	Service Voltage of Main Panel (Volts)

Bjorn Sterber Antelope Vly Water Storage LLC	
Customer Name <i>(i.e., name shown on SCE Service Account)</i>	Customer (Service Account Holder) Title <i>(e.g., Homeowner)</i>

160TH St W, Rosamond CA 93560			
Generating Facility (Service Account) Street Address	City	State	Zip Code

Kern
County

Ion House	Water and Energy Consulting
Customer Contact Name <i>(if different from above)</i>	Company Name <i>(if different from Customer)</i>

5304099702		lonwhouse@gmail.com
Phone <i>(required)</i>	Fax <i>(if applicable)</i>	Customer Email <i>(required)</i>

**NET ENERGY METERING (NEM)
GENERATING FACILITY INTERCONNECTION
APPLICATION**

10645 N. Oracle, Ste 121-216, Oro Valley AZ 85737			
Mailing Address <i>(if different from above)</i>	City	State	Zip Code

Please check here if the Customer is the Main Project Contact for this Application
(Do not check here if the Contractor is the main project contact – see Section 1.B below)

B. Contractor / Installer Information

Please check here if this is a Self-Installation *(i.e., installed by Service Account holder)* *(Proceed to Section 1.C)* No

		671377
Contractor / Installer Contact Name	Company Name	CSLB # <i>(required*)</i>

* **Please check here if the installer does not have a CSLB #.** *If the installer does have a CSLB #, it must be entered above.*

Contractor Mailing Address	City	State	Zip Code

Phone <i>(required)</i>	Fax <i>(if applicable)</i>	Contractor Email <i>(required)</i>

Please check here if the Contractor is the Main Project Contact for this Application
(Do not check here if the Service Account holder is the main project contact – see Section 1.A above)

C. Preparer Information *(if different from Section 1.B above)*

Please indicate who prepared and submitted this Application:

Lon House	
Preparer Name, Title	Preparer Company (if applicable)

**NET ENERGY METERING (NEM)
GENERATING FACILITY INTERCONNECTION
APPLICATION**

SECTION 2 – Application Type	
A. This Application is for:	
New NEM - Existing SCE Meter	

B. Please indicate the NEM program under which you intend to participate:	
NEM-MT-ST	

C. Please indicate the <u>Electric Rate Schedule</u> under which the Service Account listed in Section 1.A above receives service (prior to NEM) on or will receive service on (for new accounts): <i>(e.g., Schedule D “Domestic,” TOU-GS-1)</i>	
Other	

D. Will an Electric Vehicle (EV) Charger be installed at the same location (i.e., service account address) as the Generating Facility:	
Yes (plan on being installed)	
No	
Yes	

How many EVs are charged or will be charged by the EV Charger(s)?

SECTION 3 – Rebate Information
This Application is NOT an application for any incentive and/or rebate program. Incentives or rebates must be applied for separately with the appropriate agency – for example, see http://www.energy.ca.gov or http://www.cpuc.ca.gov .

A. Are you participating in a California rebate program related to the installation of the Generating Facility?	
No	
If yes, please provide the following information:	
i. Rebate Program:	
ii. Rebate Amount:	\$
iii. SASH Project No.³ <i>(if applicable)</i>	
iv. SOMAH-VNM Reservation No. <i>(if applicable)</i>	

(T)

³NEM-ST customers participating in the Single-family Affordable Solar Homes (SASH) Program are exempt from any interconnection application fees, provided the Generating Facility is sized 1 MW or smaller. Participation in the SASH Program, along with the Customer’s corresponding unique SASH Project Number, must be indicated in this section for those Customers to receive the NEM-ST interconnection application fee exemption.

SECTION 4 – Ownership, Pricing and Financing
A. Please indicate if the Generating Facility is / will be owned by a third party? <i>(i.e., owned by someone other than the Service Account holder listed in Section 1.A above)</i>
No (SCE customer-owned)

**NET ENERGY METERING (NEM)
GENERATING FACILITY INTERCONNECTION
APPLICATION**

B. For Customer-Owned Generating Facilities, please indicate the following:	
i. Purchase Price: <i>(indicate the system cost paid by the Customer)</i>	\$ 400000.00
ii. Was Property Assessed Clean Energy (PACE) financing used?	
No	
C. For Third-Party-Owned Generating Facilities, please indicate the following:	
i. Claimed Federal Investment Tax Credit (ITC) Cost Basis:	\$
ii. Name of Developer: <i>(at the time of sale)</i>	
iii. Contract Type: <i>(e.g., PPA, lease, pre-paid lease, other)</i>	

SECTION 5 – Net Surplus Compensation (NSC) Elections

Please indicate if the Customer elects to participate in the NSC program and receive compensation for Net Surplus Energy, if any, that may be generated during the Customer’s 12-month Relevant Period.
(This option is only available to eligible Bundled Service Customers taking service on Schedules NEM, NEM-ST, MASH-VNM, MASH-VNM-ST, NEM-V, NEM-V-ST or SOMAH-VNM.)

No

Yes (for ≤1 MW Generating Facilities) – The Customer is interested in receiving NSC and certifies under the penalty of perjury that the Generating Facility is a Qualifying Facility pursuant to the Public Utility Regulatory Policies Act of 1978 that is exempt from certification filing at the Federal Energy Regulatory Commission (FERC); or,

Yes (for >1 MW Generating Facilities) – The Customer is interested in receiving NSC and certifies under the penalty of perjury that the Generating Facility is a Qualifying Facility pursuant to the Public Utility Regulatory Policies Act of 1978 that has been self-certified as a Qualifying Facility with the FERC by the proper completion and filing of FERC Form No. 556, *Certification of Qualifying Facility (QF) Status for a Small Power Production or Cogeneration Facility*. A copy of the completed FERC Form No. 556 must be sent to SCE.

No – The Customer is not interesting in participating in the NSC program and elects not to receive NSC.

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Note: Customers electing to participate in the NSC program will receive any applicable NSC as an on-bill credit at the end of the Customer's Relevant Period. Customers may elect to receive NSC via a check instead in accordance with the provisions of the Customer's applicable NEM rate schedule.

Note: To receive compensation for Renewable Energy Credits (RECs) associated with the Customer's Net Surplus Energy, Form 14-935 must additionally be completed and submitted to SCE.

Section 6 – Cost Envelope Option (CEO) Election for Upgrades

Please indicate below if the Customer elects to participate in the CEO pursuant to Section F.7 of Rule 21 for the costs associated with any applicable Interconnection Facilities and/or Distribution Upgrades.

(The CEO is only available to customers with Interconnection Requests processed under the Fast Track Process or Independent Study Process. Customers electing this option may be subject to a \$2,500 deposit, as outlined in Section F.7 of Rule 21.)

No

Yes – Customers electing the CEO must provide all of the following additional information as part of this Interconnection Request in the manner specified by SCE:

- | | |
|--|--|
| A. Final location of the Point of Common Coupling (PCC) (Point of Change of Ownership): <i>[provide a description of the physical location of the Point of Common Coupling and indicate on the site drawing provided under Section 6.E below]</i> | |
| B. Final location of the Point of Interconnection (POI): <i>[provide a description of the physical location of the Point of Interconnection and indicate on the site drawing provided under Section 6.E below]</i> | |
| C. Confirmation of service voltage: | |
| D. Confirmation that technical data provided in the Interconnection Request is accurate, including equipment type and manufacturer: | |
| E. A site drawing on a scale of 1:30 or less, which shows the final location of the PCC, POI, and final location and routing of conductors and equipment between the PCC and POI: | |
| F. Identification of any constraints or limitations related to the siting or routing of conductors and equipment between the PCC and the POI: <i>[provide a description of the constraints/limitations and indicate their location on the site drawing provided under Section 6.E above]</i> | |

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Section 7 – New Generating Facility Description / Technical Information

The information provided in this section is for the Generating Facility that this Application seeks to have interconnected to SCE’s Distribution System or the Generating Facility that this Application seeks to modify (e.g., adding energy storage). Subsections A through D of Section 7 must be completed for all Generating Facilities. Subsections E through G are required, as applicable, only for those Generating Facilities that meet one or more of the following criteria: are sized larger than 10 kW; utilize a technology other than wind, solar or fuel cells that use renewable fuels; have a point of interconnection on the line side of the main circuit breaker (line side tap); require net generation output (NGO) metering; have additional generation on-site (including energy storage devices); and/or utilize non-certified equipment. Please complete a separate Section 7 for each new / modified Generating Facility that is seeking interconnection via this Application.

NOTE: Customers with >1 MW Generating Facilities may be subject to and have additional obligations pursuant to the California Independent System Operator (California ISO) tariff. These Customers should contact the California ISO for more information; SCE is not a party to the Customer’s interaction with the California ISO.

A. Generating Facility Description *(see Appendix A)*

i. Number of Generators	
ii. Generator Manufacturer	
iii. Generator Model Number	
iv. Generator Technology Type	Solar PV
v. Generator CEC-AC Nameplate Rating (kW)	6.393
vi. Generator Gross AC Nameplate Rating (kW) <i>Required for Generators where the CEC-AC Nameplate Rating is not available / applicable</i>	
vii. Generator Estimated Monthly Production (kWh)	533.25
viii. Inverter Information <i>For non-inverter-based Generators, please indicate “0” and “N/A”</i>	Inverter: 1 x Delta Electronics 82.8 kW (Model M80U_122 (480V) [S11]) Inverter Rating (ea): 82.764 kW AC Efficiency: 98.5% PV Module Array: 18 x United Renewable Energy 385W (Model D7K385H8A) Module Rating (ea): 385 W DC, 360.6 W PTC Tilt: 20 Azimuth: 180 Tracking: Fixed Nameplate Rating: 6.93 kW DC Inverter Nameplate Rating: 82.8 kW AC AC Rating: 6.393 kW CEC-AC
a. Number of Inverters	
b. Inverter Manufacturer(es)	
c. Inverter Model Number(s)	
ix. Module Information <i>For Generators that don’t use modules, please indicate “0” and “N/A”</i>	
a. Number of Modules	
b. Module Manufacturer(es)	
c. Module Model Number(s)	
x. Mounting Method	Rooftop
a. Average Standoff	

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xi. Tracking Type			
*If fixed, indicate:	Tilt:		Azimuth:
	N/A		
B. Are System Output Performance Monitoring and Reporting Services being utilized?			
Yes			
If yes, please indicate who is receiving the data (check all that apply):			
Customer			
If applicable, which vendor is receiving the data:			

C. Is the Generator certified by a Nationally Recognized Testing Laboratory (NRTL) in accordance with Rule 21?
If No, please explain:

C.1 If the Generator is inverter-based, is the is the Inverter(s) Certified as a Smart Inverter(s) in accordance with Rule 21 Section Hh by a Nationally Recognized Testing Laboratory (NRTL)? For non-inverter-based Generators, please indicate "N/A"
If No, please explain:

D. Electrical Connection Method			
Load side connection			
E. Additional Generating Facility Technical Information (see Appendix A)			
i. Prime Mover Type	Photovoltaic Panels		
ii. Generator Software Version Number	na		
iii. Inverter Software Version Number	na		
iv. Gross Nameplate Rating (kVA)	7		
v. Gross Nameplate Rating (kW)	6.93		
vi. Net Nameplate Rating (kW)	6.393		
vii. Operating Voltage (Volts or kV)	480		
viii. Power Factor (PF) Rating (%)	100		
ix. PF Adjustment Range (%)	Maximum	20	Minimum
			80
x. Wiring Configuration (Choose One)	Three-Phase		
xi. 3-Phase Winding Configuration (Choose One)	4 Wire Wye		
xii. Neutral Grounding Systems Used (Choose One)			
			Ohms
xiii. Short Circuit Current Produced by Generator (Amps)	10.13		
xiv. Generator Design (Choose One)	Inverter		

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xv. For Synchronous Generators Only: <i>(Gross kVA Nameplate Rating must be provided above)</i>	
a. Base kVA <i>(if different from Gross Nameplate kVA above)</i>	
b. Synchronous Reactance (%)	
c. Transient Reactance (%)	
d. Subtransient Reactance (%)	
xvi. For Induction Generators Only: <i>(Gross kVA Nameplate Rating must be provided above)</i>	
a. Base kVA <i>(if different from Gross Nameplate kVA above)</i>	
b. Locked Rotor Current (Amps) OR	
c. Stator Resistance (%)	
d. Stator Leakage Reactance (%)	
e. Rotor Resistance (%)	
f. Rotor Leakage Reactance (%)	
xvii. For Generators that are Started as a Motor Only:	
a. In-Rush Current (Amps)	
b. Customer's Main Panel Continuous Current Rating (Amps)	

F. Information Required for <u>MASH-VNM/ST,NEM-V/ST and SOMAH-VNM</u> Interconnection Requests (T)
i. Does your interconnection satisfy SCE's ESR?
ii. Is the current proposed tie-in point a result of restrictions placed on altering the existing panel or equipment within, as imposed by the local authority having jurisdiction?
iii. Are there existing utility facilities in the vicinity of the proposed point of interconnection? Minimum clearances must be maintained from SCE facilities, as specified in SCE's ESR and/or Underground Structures Standards (UGS).

G. Additional Information Required for Interconnection Requests that Include <u>Energy Storage Devices</u> (e.g., batteries)
i. Will an Energy Storage Device (ESD) be connected behind the same SCE meter as the New Generating Facility?
<input type="checkbox"/> Yes , an ESD is currently interconnected <i>(proceed to Section 6.D unless the ESD is being modified)</i> Yes (to new generator)
<input type="checkbox"/> Yes , an ESD will be interconnected as part of this Application <i>(please complete the information below)</i> No

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ii. ESD Type	Other water	
iii. Number of ESDs	1	
iv. ESD Manufacturer(es)	Delta Electronics	
v. ESD Model Number(s)	M80U-121	
vi. ESD Max Capacity (kWh)	500	
vii. ESD Rated Discharge (kW)	40	
viii. ESD Max Discharge (kW)	50	
ix. Please list the devices used to limit discharge (if any): (e.g., inverter, power control)	Inverter	
x. Please describe the intended use of the ESD:	For example, peak shaving, export to the grid, load shifting, back-up, etc. The intended use specified may be taken into consideration during any applicable study processes.	
	Storage device will store water during off peak periods for generation though Aquifer Pumped Hydro (APH) unit during peak periods. This is CEC demonstration project EPC19-058 to demonstrate APH feasibility. Expected to operate for about 18 months. The CEC project requires: demonstration of APH generation I (export to the grid) and demonstration of APH generation used to charge EVs.	
xi. Energy Storage Charging Function		
a. Rated Charge Load Demand (kW)		145
b. Estimated annual Net Energy Usage* of the ESD (kWh) <small>*Net Energy Usage = (kWh input, including charging, storage device auxiliary loads, and losses) – (kWh output, including discharging)</small>		
c. Will SCE's Distribution System be used to charge the ESD:	Yes	
If no: Provide technical description of control systems including:		
<ul style="list-style-type: none"> Source of energy for charging: Mechanism to prevent charging from the Distribution System: 	Solar will provide about 13300 kWh per year. This amount of electricity will provide enough water for about 75 hours of APH operation as a generator (3750 kWh). Grid power will be needed, as the solar generation capacity is not large enough to operate the APH pump. Charging (pumping water) will be done during off peak periods. Generating will be done during on peak periods.	
If yes: Will charging the ESD increase the host facility's existing peak load demand?	No	
If yes: Provide the following load information:		
<ul style="list-style-type: none"> Amount of added peak demand (kW): 		
If no: Provide technical description of control systems, including:		
<ul style="list-style-type: none"> Charging periods: Mechanism to prevent charging from the Distribution System during host facility peak: 	Solar will provide about 13300 kWh per year. This amount of electricity will provide enough water for about 75 hours of APH operation as a generator (3750 kWh). Grid power will be needed, as the solar generation capacity is not large enough to operate the APH pump. Charging (pumping water) will be done during off peak periods. Generating will be done during on peak periods.	

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xii. Generation / Export Function	
a. Will the Generating Facility(ies) export power to SCE's Distribution System? (Include all generation sources behind the SCE meter specified in Section 1.A above, such as PV, an ESD or other technologies when answering)	
Yes	
If yes, please specify the Generating Facility's maximum coincident export to the grid: 50 (kW)	
b. If all generation sources are not simultaneously exporting to the grid, please provide a technical description of the control systems for this function:	
APH will only be operating in the on-peak periods, when solar is not producing.	

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Section 8 – Existing Generating Facility Description / Technical Information

The information provided in this section is for previously interconnected generating facilities that already exist behind the same SCE meter as the new Generating Facility(ies) outlined in Section 7 above. If an existing generating facility is being modified by this Application, please complete Section 7 (and not Section 8) for that Generating Facility. Please complete a separate Section 8 for each existing generating facility.

A. Existing Generating Facility Description <i>(see Appendix A)</i>			
i. Number of Generators			
ii. Generator Manufacturer			
iii. Generator Model Number			
iv. Generator Technology Type			
v. Generator CEC-AC Nameplate Rating (kW)			
vi. Generator Gross AC Nameplate Rating (kW) <i>Required for Generators where the CEC-AC Nameplate Rating is not available / applicable</i>			
vii. Generator Estimated Monthly Production (kWh)			
viii. Inverter Information <i>For non-inverter-based Generators, please indicate "0" and "N/A"</i>			
a. Number of Inverters			
b. Inverter Manufacturer(es)			
c. Inverter Model Number(s)			
ix. Module Information <i>For Generators that don't use modules, please indicate "0" and "N/A"</i>			
a. Number of Modules			
b. Module Manufacturer(es)			
c. Module Model Number(s)			
x. Prime Mover Type			
xi. Generator Software Version Number			
xii. Inverter Software Version Number			
xiii. Gross Nameplate Rating (kVA)			
xiv. Gross Nameplate Rating (kW)			
xv. Net Nameplate Rating (kW)			
xvi. Operating Voltage (Volts or kV)			
xvii. Power Factor (PF) Rating (%)			
xviii. PF Adjustment Range (%)	Maximum		Minimum
xix. Wiring Configuration <i>(Choose One)</i>			
xx. 3-Phase Winding Configuration <i>(Choose One)</i>			
xxi. Neutral Grounding Systems Used <i>(Choose One)</i>			
		Ohms	
xxii. Short Circuit Current Produced by Generator <i>(Amps)</i>			
xxiii. Generator Design <i>(Choose One)</i>			
xxiv. For Synchronous Generators Only: <i>(Gross kVA Nameplate Rating must be provided above)</i>			

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a. Base kVA (if different from Gross Nameplate kVA above)	
b. Synchronous Reactance (%)	
c. Transient Reactance (%)	
d. Subtransient Reactance (%)	
xxv. For Induction Generators Only: (Gross kVA Nameplate Rating must be provided above)	
a. Base kVA (if different from Gross Nameplate kVA above)	
b. Locked Rotor Current (Amps) <u>OR</u>	
c. Stator Resistance (%)	
d. Stator Leakage Reactance (%)	
e. Rotor Resistance (%)	
f. Rotor Leakage Reactance (%)	
xxvi. For Generators that are Started as a Motor Only:	
a. In-Rush Current (Amps)	
b. Customer's Main Panel Continuous Current Rating (Amps)	

B. Is the Generator served on an NEM tariff?	
<input type="checkbox"/> Yes – Please specify which NEM tariff:	
<input type="checkbox"/> No	

C.1 If the Generator is inverter-based, is the is the Inverter(s) Certified as a Smart Inverter(s) in accordance with Rule 21 Section Hh by a Nationally Recognized Testing Laboratory (NRTL)? For non-inverter-based Generators, please indicate "N/A"
If No, please explain:

C. Is the Generator certified by a Nationally Recognized Testing Laboratory (NRTL) in accordance with Rule 21?
<input type="checkbox"/> No – Please explain:

D. Electrical Connection Method

E. Additional Information Required for Interconnection Requests that Include Existing Energy Storage Devices (e.g., batteries)
i. ESD Type

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ii. Number of ESDs	
iii. ESD Manufacturer(es)	
iv. ESD Model Number(s)	
v. ESD Max Capacity (kWh)	
vi. ESD Rated Discharge (kW)	
vii. ESD Max Discharge (kW)	
viii. Please list the devices used to limit discharge (if any) (e.g., inverter, power control):	
ix. Energy Storage Charging Function	
a. Rated Charge Load Demand (kW)	
b. Estimated annual Net Energy Usage* of the ESD (kWh) <small>*Net Energy Usage = (kWh input, including charging, storage device auxiliary loads, and losses) – (kWh output, including discharging)</small>	
c. Will SCE's Distribution System be used to charge the ESD:	
If no: Provide technical description of control systems including:	
<ul style="list-style-type: none"> • Source of energy for charging: 	
<ul style="list-style-type: none"> • Mechanism to prevent charging from the Distribution System: 	
If yes: Will charging the ESD increase the host facility's existing peak load demand?	
If yes: Provide the following load information:	
<ul style="list-style-type: none"> • Amount of added peak demand (kW): 	
If no: Provide technical description of control systems, including:	
<ul style="list-style-type: none"> • Charging periods: 	
<ul style="list-style-type: none"> • Mechanism to prevent charging from the Distribution System during host facility peak: 	

Section 9 – Safety and Consumer Protection Acknowledgements

This section is applicable to Customers requesting service on Schedules NEM-ST, MASH-VNM-ST or NEM-V-ST.

A. Equipment Verification

- For Applicants with Solar Generating Facilities** - By checking this box, Applicant verifies that all major solar system components (including PV panels and other generation equipment, inverters and meters) are on the verified equipment list maintained by the California Energy Commission. This requirement is subject to additional verification by SCE.

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Note: For all Generating Facilities, SCE may require the Applicant to verify that other equipment, as determined by SCE, has safety certification from a NRTL.

B. Warranty Verification

- By checking this box, Applicant verifies that a warranty of at least 10 years has been provided on all equipment and the installation of that equipment. In appropriate circumstances conforming to industry practice, satisfaction of this requirement may rely on manufacturers' warranties for equipment and separate contractors' warranties for workmanship (i.e., installation). Warranties or service agreements conforming to requirements applicable to the Self-Generation Incentive Program (SGIP) may be used to satisfy this requirement for Generating Facilities with technologies eligible for the SGIP. This requirement is subject to additional verification by SCE.

SECTION 10 – Additional Information

Please refer to the NEM Interconnection Handbook for a complete list of technical information that is required when submitting this Application. The NEM Interconnection Handbook can be found at <http://www.sce.com/nem> under the “NEM Forms and Documents” section. All drawings must conform to accepted engineering standards and must be legible. 11” x 17” drawings are preferred.

Please also refer to the NEM Application Checklist on <http://www.sce.com/nem> for additional forms that may be required based on your interconnection request.

Finally, please indicate here if there are additional existing generating facilities located on the same Premises (but not behind the same SCE revenue meter) as the NEM Generating Facility that is seeking interconnection pursuant to this Application.

Section 11 – Submittal Instructions, Payment and Assistance

Completed applications must be submitted via SCE's online application tool, which can be accessed at <https://sceinterconnect.powerclerk.com/Account/Login>. Any applicable Interconnection Request fees must be paid electronically via credit card (Visa or MasterCard) or debit card at the time the application is submitted online.

All NEM Projects (except NEM-MT)

If you have questions or need assistance in completing this application, please call SCE's NEM team at (866) 600-6290.

NEM-MT (Multiple Tariff) Projects

If you have questions or need assistance in completing this NEM-MT Application, please contact SCE for Distributed Generation at (626) 302-3688 or email interconnectionQA@sce.com.

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Appendix A – Instructions for Completing Sections 7 and 8									
Manufacturer	Enter the brand name of the generator.								
Model Number	Enter the model number assigned by the manufacturer of the generator.								
Technology Type	<ul style="list-style-type: none"> • For <i>Schedules NEM, NEM-ST, NEM-V and NEM-V-ST</i>: biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and any additions or enhancements to the facility using that technology. • For <i>Schedules MASH-VNM, MASH-VNM-ST and SOMAH-VNM</i>: Solar PV • For <i>Schedule FC-NEM</i>: Fuel Cells 								
CEC-AC Nameplate Rating	<p>For NEM generating facilities, this value is the CEC-AC Net Nameplate Rating and is not the same as the Net Nameplate that accounts for auxiliary loads or station service loads. The calculations used are as follows:</p> <table border="0"> <tr> <td>Technology</td> <td>CEC-AC Nameplate Calculation</td> </tr> <tr> <td>Solar PV</td> <td>(Qty of Modules) x (PTC Rating) x (Inverter Efficiency %) / 1000 = ____ kW</td> </tr> <tr> <td>Wind</td> <td>(Qty of Turbines) x (Power Output) x (Inverter Efficiency %) / 1000 = ____ kW</td> </tr> <tr> <td>Fuel Cell</td> <td>(Qty of Cells) x (Rated Output) x (Inverter Efficiency %) / 1000 = ____ kW</td> </tr> </table>	Technology	CEC-AC Nameplate Calculation	Solar PV	(Qty of Modules) x (PTC Rating) x (Inverter Efficiency %) / 1000 = ____ kW	Wind	(Qty of Turbines) x (Power Output) x (Inverter Efficiency %) / 1000 = ____ kW	Fuel Cell	(Qty of Cells) x (Rated Output) x (Inverter Efficiency %) / 1000 = ____ kW
Technology	CEC-AC Nameplate Calculation								
Solar PV	(Qty of Modules) x (PTC Rating) x (Inverter Efficiency %) / 1000 = ____ kW								
Wind	(Qty of Turbines) x (Power Output) x (Inverter Efficiency %) / 1000 = ____ kW								
Fuel Cell	(Qty of Cells) x (Rated Output) x (Inverter Efficiency %) / 1000 = ____ kW								
Gross AC Nameplate Rating	This is the capacity value normally supplied by the manufacturer and stamped on the Generator’s nameplate.								
Estimated Monthly Production	Example (solar): CEC-AC kW * 720 hours * 0.2 (solar) = Estimated Monthly kWh; the factors for other technologies can be found in the NEM Interconnection Handbook.								
Inverter Manufacturer	Enter the brand name of the inverter.								
Inverter Model Number	Enter the model number assigned by the manufacturer of the inverter.								
Module Manufacturer	Enter the brand name of the modules.								
Module Model Number	Enter the model number assigned by the manufacturer of the modules.								
Mounting Method	Applicable to solar generating facilities.								
Tracking Type	Applicable to solar generating facilities.								
NRTL Certification	Answer “yes” only if the generator manufacturer can or has provided certification data. Please see SCE’s Rule 21, Section L for additional information regarding this certification.								
Smart Inverter Certification	Answer “yes” only if the inverter manufacturer can or has provided certification data. Please see SCE’s Rule 21, Section Hh for Smart Inverter requirements, and Section L for additional information regarding certification.								
Prime Mover Type	Please indicate the type and fuel used as the prime mover or source of energy for the generator.								
Generator Software Version	If the control and/or protective functions are dependent on a software program supplied by the manufacturer of the equipment, please provide the version or release number for the software that will be used.								
Inverter Software Version	If the control and/or protective functions are dependent on a software program supplied by the manufacturer of the equipment, please provide the version or release number for the software that will be used.								
Gross Nameplate Rating (kVA)	This is the capacity value normally supplied by the manufacturer and stamped on the Generator’s nameplate. This value is not required where								

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	the manufacturer provides only a kW rating. However, where both kVA and kW values are available, please provide both.
Gross Nameplate Rating (kW)	This is the capacity value normally supplied by the manufacturer and stamped on the Generator's nameplate. This value is not required where the manufacturer provides only a kVA rating. However, where both kVA and kW values are available, please provide both. For NEM generating facilities, the "gross" value is DC power.
Net Nameplate Rating (kW)	<ul style="list-style-type: none"> • For NEM generating facilities, this value is the CEC-AC Net Nameplate Rating and is not the same as the Net Nameplate that accounts for auxiliary loads or station service loads. • For non-NEM generating facilities (e.g., those included in an NEM-MT installation), this capacity value is determined by subtracting the "Auxiliary" or "Station Service" loads used to operate the Generator or Generating Facility. Applicants are not required to supply this value but, if it is not supplied, applicable Standby Charges may be based on the higher "gross" values.
Operating Voltage	This value should be the voltage rating designated by the manufacturer and used in the Generator. Please indicate phase-to-phase voltages for 3-phase installations. See SCE's Rule 21, Section H.2.b. for additional information.
Power Factor (PF) Rating	This value should be the nominal power factor rating designated by the manufacturer for the Generator. See SCE's Rule 21, Section H.2.i. for additional information.
PF Adjustment Range	Where the power factor of the Generator is adjustable, please indicate the maximum and minimum operating values. See SCE's Rule 21, Section H.2.i.
Wiring Configuration	Please indicate whether the Generator is a single-phase or three-phase device. See SCE's Rule 21, Section H.3.
3-Phase Winding Configuration	For three-phase generating units, please indicate the configuration of the Generator's windings or inverter systems.
Neutral Grounding System Used	Wye-connected generating units are often grounded – either through a resistor or directly, depending upon the nature of the electrical system to which the Generator is connected. If the grounding method used at this facility is not listed, please attach additional descriptive information.
Short Circuit Current Produced by Generator	Please indicate the current each Generator can supply to a three-phase fault across its output terminals. For single phase Generators, please supply the phase-to-phase fault current.
Generator Design	Please indicate the designated type of each Generator. Designate "Inverter" anytime an inverter is used as the interface between the Generator and the electric system regardless of the primary power production / storage device used.
For Synchronous Generators	If the Generator is a "synchronous" design, please provide the synchronous reactance, transient reactance, and subtransient reactance values supplied by the manufacturer along with the Gross kVA Nameplate Rating or Base kVA, if different. This information is necessary to determine the short circuit contribution of the Generator and as data in load flow and short circuit computer models of SCE's Distribution System.

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For Induction Generators	If the Generator is an “induction” design, please provide the locked rotor current value supplied by the manufacturer along with the Gross kVA Nameplate Rating or Base kVA, if different. If this value is not available, the stator resistance, stator leakage reactance, rotor resistance, and rotor leakage reactance values supplied by the manufacturer may be used to determine the locked rotor current.
For Generators started as Motors	This information is needed only for Generators that are started by “motoring” the generator. See SCE’s Rule 21, Section G.1.c. and Section L.3.d for significance and additional information.

Appendix E. NEM GFIA Form 16-344 and Form 14-931



SOUTHERN CALIFORNIA EDISON COMPANY
NET ENERGY METERING AND RENEWABLE ELECTRICAL GENERATING
FACILITY INTERCONNECTION AGREEMENT FOR GENERATING
FACILITIES SIZED ONE MEGAWATT AND SMALLER

This Net Energy Metering (NEM) and Renewable Electrical Generating Facility Interconnection Agreement ("Agreement") is entered into by and between Antelope Vly Water Storage LLC ("Customer"), and Southern California Edison Company ("SCE"), sometimes also referred to herein jointly as "Parties" or individually as "Party."

1. APPLICABILITY

This Agreement is applicable only to Customers who satisfy all requirements of the definition of a Renewable Electrical Generating Facility ("Generating Facility") sized one megawatt (MW) and smaller as set forth in paragraph 1 of subdivision (a) of Section 25741 of the California Public Resources Code and all conditions and requirements as specified in Schedule NEM and its successor, Schedule NEM-ST.

2. SUMMARY OF GENERATING FACILITY AND CUSTOMER ACCOUNT

- 2.1 Generating Facility Identification Number: NST
2.2 Customer Meter Number: 2902 345M-001174
2.3 Customer Service Account Number: 8002087301
2.4 Applicable Rate Schedule: TOU-PA-2
2.5 Generating Facility Location: 160th St W Rosamond CA
Gaskell and 160th

2.5.1 This agreement is applicable only to the Generating Facility described below and installed at the above location. The Generating Facility may not be relocated or connected to SCE's system at any other location without SCE's express written permission.

2.5.2 which includes biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells (using renewable fuel), small hydroelectric generation, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and any additions or enhancements using such technology.

2.5.3 Renewable Electrical Generating Facilities using fuel cells, municipal solid waste conversion, and small hydroelectric generating will be required to sign an Affidavit (Form 14-912) certifying the following criteria have been met:

- a) For purposes of this Agreement, qualifying "solid waste conversion" is defined pursuant to Public Resources Code Section 25741(b)(3).
b) For purposes of qualifying under "fuel cell" using renewable fuels, the Generating Facility must use technology the California Public Utilities Commission ("Commission") determines will achieve reductions in emissions of greenhouse gases and meet emissions requirements for eligibility for funding pursuant to the Self-Generation Incentive Programs.
c) A "small hydroelectric" generating facility is not an eligible Generating Facility if it will cause an adverse impact on instream beneficial uses or cause a change in the volume or timing of streamflow.

2.6 Generating Facility Technology (technologies using the renewable resources reflected above): PV Solar

2.7	Generating Facility Nameplate Rating (kW):	6.93
2.8	Generating Facility CEC-AC Rating or Equivalent (kW):	5.55
2.9	Estimated monthly energy production of Generating Facility (kWh):	1070

3. METERING AND BILLING:

3.1 Metering requirements and billing procedures shall be set forth in SCE’s, Electric Service Provider’s and/or Community Choice Aggregator’s/Community Aggregator’s rate schedule(s) applicable to the electric service account assigned to the location where the Generating Facility is connected.

3.2 MONTHLY BILLING ELECTION:

By default, Residential and Small Commercial NEM Customers are billed (i.e., required to pay) ANNUALLY for their energy charges. However, the provisions of Schedules NEM and NEM-ST provide that “Upon a Customer’s request, SCE shall permit a Residential or Small Commercial Customer to pay all applicable energy charges monthly.

Customers on monthly billing will receive monthly bill statements showing both the energy and non- energy related billing components and corresponding charges, and will be required to pay any positive energy charges monthly.

Having considered billing options that are available, I hereby request for monthly billing for the Customer Service Account Number listed above. _____ (initial here)

4. GENERATING FACILITY INTERCONNECTION AND DESIGN REQUIREMENTS:

4.1 Customer shall be responsible for the design, installation, operation, and maintenance of the Generating Facility and shall obtain and maintain any required governmental authorizations and/or permits.

4.2 The Generating Facility shall meet all applicable safety and performance standards established by the National Electrical Code, the Institute of Electrical and Electronics Engineers (“IEEE”), and accredited testing laboratories such as Underwriters Laboratories (“UL”), and, where applicable, rules of the Commission regarding safety and reliability. This requirement shall include, but not be limited to, the provisions of IEEE Standard 929, UL Standard 1741 and SCE’s Electric Rule 21 – Generating Facility Interconnections.

4.3 For Customers interconnecting a Generating Facility under the provisions of Schedule NEM-ST, the Generating Facility must have a warranty of at least 10 years for all equipment and the associated installation from the system provider. In appropriate circumstances conforming to industry practice, this requirement may rely on and be satisfied by manufacturers’ warranties for equipment and separate contractors’ warranties for workmanship (i.e., installation). Warranties or service agreements conforming to requirements applicable to the Self-Generation Incentive Program (“SGIP”) may also be used for technologies eligible for the SGIP.

4.4 For Customers interconnecting a solar Generating Facility under the provisions of Schedule NEM-ST, all major solar system components (including PV panels and other generation equipment, inverters and meters) must be on the verified equipment list maintained by the California Energy Commission (“CEC”). For all NEM-ST Generating Facilities, any other equipment, as determined by SCE, must be verified as having safety certification from a Nationally Recognized Testing Laboratory (“NRTL”).

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SOUTHERN CALIFORNIA EDISON COMPANY
NET ENERGY METERING AND RENEWABLE ELECTRICAL GENERATING
FACILITY INTERCONNECTION AGREEMENT FOR GENERATING
FACILITIES SIZED ONE MEGAWATT AND SMALLER

NPI or new Customer's name and Generating Facility location, capacity and operational characteristics. SCE will provide the NPI or new Customer with (i) a copy of the interconnection agreement in effect and as signed by the previous customer, which will remain unchanged, (ii) a copy of the NEM Fact Sheet on operation and billing, and (iii) SCE's website information on the NEM or NEM-ST tariffs.

- 10.6 A new Customer or NPI who owns, rents or leases a premises that includes a NEM Generating Facility above 30 kW will need to sign a new interconnection agreement. If no changes are made to the interconnection facilities, the agreement will have identical terms and conditions as the ones approved for the previous customer.

11. NOTICES:

- 11.1 Any notice required under this Agreement shall be in writing and mailed at any United States Post Office with postage prepaid and addressed to the Party, or personally delivered to the Party, at the address below. Changes in such designation may be made by notice similarly given. All written notices shall be directed as follows:

SOUTHERN CALIFORNIA EDISON COMPANY:

Attn: NEM Program Administrator
SCE Customer Solar & Self Generation
P.O. Box 800
Rosemead, CA 91770

CUSTOMER:

Account Name: _____ Bjorn Sterber _____
Mailing Address _____ 4700 Wilshire Blvd _____
Mailing City: _____ Los Angeles _____ Mailing State: _____ CA _____
Mailing Zip Code: _____ 90010-3853 _____

- 11.2 Customer's notices to SCE pursuant to this Section shall refer to the Generating Facility Identification Number that is set forth in Section 2.1

12. TERM AND TERMINATION OF AGREEMENT:

- 12.1 This Agreement shall become effective when SCE issues written authorization to interconnect the Generating Facility after receipt of all required documents and payments, and this completed Agreement signed by the Customer and SCE, and shall remain in effect thereafter from month to month unless terminated by either Party on thirty (30) days' prior written notice in accordance with Section 11.
- 12.2 This Agreement shall terminate, without notice, upon: (a) termination of the electric distribution service provided to Customer by SCE; or (b) changes to Customer's electric load which cause Customer to no longer satisfy all requirements of the definition of an Eligible Customer-Generator, as set forth in Sections 2827(b)(4) or 2827.1(a) of the California Public Utilities Code; or (c) termination of Customer's NEM arrangements with its Electric Service Provider, Community Choice Aggregator or Community Aggregator.

13. TRANSITION PROVISIONS:

- 13.1 Customers receiving service on Schedule NEM, or who have submitted all documentation necessary for receiving service on Schedule NEM, prior to SCE reaching its NEM trigger level or July 1, 2017, whichever is earlier, are subject to the transition provisions as outlined



SOUTHERN CALIFORNIA EDISON COMPANY
NET ENERGY METERING AND RENEWABLE ELECTRICAL GENERATING
FACILITY INTERCONNECTION AGREEMENT FOR GENERATING
FACILITIES SIZED ONE MEGAWATT AND SMALLER

in Schedule NEM.

13.2 Customers receiving service on Schedule NEM-ST, or who have submitted all documentation necessary for receiving service on Schedule NEM-ST, are subject to the transition provisions as outlined in Schedule NEM-ST.

14. REQUIRED DISCLOSURE

(N)

This Agreement is subject to SCE's Rule 21 protocols, including the Confidentiality provisions (Section D.7) and the Required Disclosure (Section D.7.d). As a condition of interconnection, pursuant to the California Public Utilities Commission (CPUC) Decisions D.14-11-001 and D.21-06-026, SCE is required to provide certain data, including, but not limited to, confidential customer information, to the CPUC, its contractors, the California Department of Consumer Affairs Contractors State License Board, and the California Department of Financial Protection & Innovation. Customer authorizes SCE to release any and all information contained this application for interconnection to the entities identified above without further notification or consent.

(N)

15. SIGNATURES:

This Agreement may be executed in counterparts, and by Electronic Signature on the part of SCE and/or the Customer, and copies of a Party's signed signature page may be transmitted to the other Party by facsimile or other electronic means. Copies of the signature page so transmitted may be used for the purpose of enforcing the terms of this Agreement as though they were originals and will not be made inadmissible in any legal or regulatory proceeding concerning this Agreement on the basis of the Best Evidence Rule or similar rule of admissibility.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed by their duly authorized representatives. This Agreement is effective as provided in Section 12.1 above.

CUSTOMER

SOUTHERN CALIFORNIA EDISON COMPANY

By: Mark Beuhler
Name: Mark Beuhler
Title: General Manager - Antelope Valley Water Storage
Date: April 11, 2022

By: _____
Name: _____
Title: _____
Date: _____



Southern California Edison
Rosemead, California (U 338-E)

Revised Cal. PUC Sheet No. 70558-E
Cancelling Revised Cal. PUC Sheet No. 69355-E

Sheet 1

GENERATING FACILITY INTERCONNECTION AGREEMENT
Multiple Tariffs
Form 14-773

(Continued)

(To be inserted by utility)

Advice 4403-E

Decision _____

Issued by

Carla Peterman

Senior Vice President

(To be inserted by Cal. PUC)

Date Submitted Jan 28, 2021

Effective Feb 27, 2021

Resolution _____

Generating Facility Interconnection Agreement (Multiple Tariff) ("Agreement") is entered into by and between *(Enter customer name)* Antelope Vly Water Storage LLC

_____, a California Corporation

(Please verify business type and indicate state of incorporation, if applicable) ("Producer"), and Southern California Edison Company ("SCE"), a California corporation. Producer and SCE are sometimes also referred to in this Agreement jointly as "Parties" or individually as "Party." In consideration of the mutual promises and obligations stated in this Agreement and its Appendices, the Parties agree as follows:

1. SCOPE AND PURPOSE

- 1.1 This Agreement provides for Producer to interconnect and operate a Generating Facility in parallel with SCE's Distribution System to serve the electrical loads at the location identified in Section 2.4 (or for the qualifying energy where permitted under Section 218 of the California Public Utilities Code ("PUC")). The Generating Facility may consist of any combination of (a) generator(s) for which Producer qualifies as an "eligible customer-generator" for net energy metering ("NEM") service pursuant to PUC Sections 2827 through 2827.10 ("Eligible Generator(s)"), and (b) other generator(s) ("Non-Eligible Generator(s)"). Pursuant to PUC Sections 2827 biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal or tidal current, and any additions or enhancements to the facility using that technology or other fuel cells (pursuant to PUC Section 2827.10).
- 1.2 This Agreement provides for Producer to operate the Eligible Generator(s) pursuant to the provisions of Sections 2827 through 2827.10 of the California PUC and the applicable SCE tariffs for NEM. This Agreement also provides for Producer to operate its Non-Eligible Generator(s). This Agreement does not provide for retail electrical service by SCE to Producer. Such arrangements must be made separately between SCE and Producer.
- 1.3 This Agreement does not address Producer's account billing and payment for energy consumption. For the Generating Facility as specified in Section 2 of this Agreement, please refer to the applicable SCE NEM tariff schedules for billing and payment protocol.

2. SUMMARY AND DESCRIPTION OF PRODUCER'S GENERATING FACILITY

- 2.1 A description of the Generating Facility, including a summary of its significant components and a single-line diagram showing the arrangement of how Producer's Generating Facility and loads are interconnected with SCE's Distribution System are attached hereto as Appendix A and incorporated herein by reference.
- 2.2 Generating Facility identification number: (Assigned by SCE).
- 2.3 Producer's SCE service account number: (Assigned by SCE).
- 2.4 Name and address used by SCE to locate the electric service account(s) used to interconnect the Generating Facility with SCE's Distribution System.

Name: Bjorn Sterber

Address: 160 St W

City: Rosamond, CA 93560

3-	-	-	GFID
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2.5 The **Gross** Nameplate Rating of the Generating Facility is:

2.5.1 Eligible Generator(s):

Renewable Electrical Generating Facility

Solar: 7 kW

Wind: _____ kW

Biomass: _____ kW

Solar Thermal: _____ kW

Geothermal: _____ kW

Fuel Cells Using Renewable Fuels: _____ kW

Small Hydroelectric Generators: _____ kW

Municipal Solid Waste Conversion: _____ kW

Landfill Gas: _____ kW

Ocean Wave: _____ kW

Ocean Thermal or Tidal Current: _____ kW

Digester Gas: _____ kW

Non Renewable Electrical Generating Facility

Biogas Digester: _____ kW

Fuel Cell: _____ kW

2.5.2 Non-Eligible Generator(s): 50 kW

2.5.3 Total **Gross** Nameplate Rating of the Generating Facility(ies): 57
kW

2.6 The **Net** Nameplate Rating of the Generating Facility is:

2.6.1 Eligible Generator(s):

Renewable Electrical Generating Facility

Solar: 6.39 kW

Wind: _____ kW

Biomass: _____ kW

Solar Thermal: _____ kW

Geothermal: _____ kW

Fuel Cells Using Renewable Fuels: _____ kW

Small Hydroelectric Generators: _____ kW

Municipal Solid Waste Conversion: _____ kW

Landfill Gas: _____ kW

Ocean Wave: _____ kW

Ocean Thermal or Tidal Current: _____ kW

Digester Gas: _____ kW

Non Renewable Electrical Generating Facility

Biogas Digester: _____ kW

Fuel Cell: _____ kW

2.6.2 Non-Eligible Generator(s): 44 kW

2.6.3 **Total NET** Nameplate Rating of the Generating Facility(ies): _____
50.39 kW

- 2.7 The **maximum level of power** that may be exported by the Generating Facility to SCE's Distribution System is expected to be:
- 2.7.1 Eligible Generator(s):
Renewable Electrical Generating Facility
Solar: 6.39 kW
Wind: kW
Biomass: kW
Solar Thermal: kW
Geothermal: kW
Fuel Cells Using Renewable Fuels: kW
Small Hydroelectric Generators: kW
Municipal Solid Waste Conversion: kW
Landfill Gas: kW
Ocean Wave: kW
Ocean Thermal or Tidal Current: kW
Digester Gas: kW
- Non Renewable Electrical Generating Facility**
Biogas Digester: kW
Fuel Cell: kW
- 2.7.2 Non-Eligible Generator(s): 44 kW
- 2.7.3 **Total maximum level of power** that may be exported by the Generating Facility(ies): 44 kW APH and solar will never be working simultaneously
- 2.8 The Generating Facility's expected date of Parallel Operation is 9/2022. The expected date of Parallel Operation shall be within two years of the date of this Agreement.
- 2.9 For the purpose of securing the Competition Transition Charge exemption available under Section 372 of the California Public Utilities Code, Producer hereby declares that the portion of the Generating Facility that is generating in a combined heat and power mode does / does not meet the requirements for Cogeneration as such term is used in Section 216.6 of the California Public Utilities Code. _____ (insert "Not Applicable" if a combined heat and power mode of operation does not apply).
- 2.10 What applicable rate schedule, known as the "otherwise applicable tariff," will be selected for the NEM account(s):
3. DOCUMENTS INCLUDED; DEFINED TERMS
- 3.1 This Agreement includes the following exhibits, which are specifically incorporated herein and made a part of this Agreement.
- Appendix A - Description of Generating Facility and Single-Line Diagram (Supplied by Producer).
- Appendix B - Information concerning Electric Rules 2 and 21 and other selected rules and tariffs of SCE (Supplied by SCE).
- Appendix C - (When Applicable) A copy of an agreement addressing Interconnection Facility financing and ownership (Supplied by SCE).

- Appendix D - (When Applicable) Producer's warranty that the Generating Facility meets the requirements for a "Cogeneration" facility as defined in Section 216.6 of the California Public Utilities Code.
 - Appendix E - (When Applicable) Listing of eligible service accounts, as defined in SCE's Schedule BG-NEM or FC-NEM, to be included in NEM calculations.
 - Appendix F - (When Applicable) List of eligible service accounts, as defined in SCE's Schedule NEM or NEM-ST, to be included in NEM Aggregation calculations.
 - Appendix G - (When Applicable) Producer warranty and verified equipment requirements applicable to Generating Facilities requesting interconnection pursuant to the provisions of the NEM successor tariffs (i.e., Schedule NEM-ST).
 - Appendix H - (When Applicable) Operating Requirements for Energy Storage Device(s).
 - Appendix I - (When Applicable) Producer's warranty that it meets the requirements for an Eligible Fuel Cell Customer-Generator and the Generating Facility is an Eligible Fuel Cell Electrical Generating Facility Pursuant to Section 2827.10 of the California Public Utilities Code.
- 3.2 When initially capitalized, whether in the singular or in the plural, the terms used herein shall have the meanings assigned to them either in this Agreement or in SCE's Electric Rule 1 or Electric Rule 21, Section C. If any term is defined in both Electric Rule 1 and Electric Rule 21, the definition in Electric Rule 21 shall prevail.

4. TERM AND TERMINATION

- 4.1 This Agreement shall become effective as of the last date entered in Section 17 of this Agreement. This Agreement shall continue in full force and effect until the earliest date that one of the following events occurs:
- (a) The Parties agree in writing to terminate the Agreement; or
 - (b) Unless otherwise agreed in writing by the Parties, at 12:01 A.M. on the day following the date the electric service account through which Producer's Generating Facility is interconnected to SCE's Distribution System is closed or terminated; or
 - (c) At 12:01 A.M. on the 61st day after Producer or SCE provides written Notice pursuant to Section 9 of this Agreement to the other Party of Producer's or SCE's intent to terminate this Agreement.
- 4.2 Producer may elect to terminate this Agreement for any reason pursuant to the terms of Section 4.1(c). SCE may elect to terminate this Agreement pursuant to the terms of Section 4.1(c) for one or more of the following reasons:
- (a) A change in applicable tariffs as approved or directed by the California Public Utilities Commission ("Commission"), or a change in any local, state or federal law, statute or regulation, either of which materially alters or otherwise affects SCE's ability or obligation to perform SCE's duties under this Agreement; or
 - (b) Unless otherwise agreed in writing by the Parties, Producer fails to take all corrective actions specified in SCE's Notice, within the timeframe set forth in such Notice, that Producer's Generating Facility is out of compliance with the terms of this Agreement; or
 - (c) Producer fails to interconnect and operate the Generating Facility per the terms of this Agreement within 120 days of the date of Parallel Operation as set forth in Section 2.7 of this Agreement; or
 - (d) Producer abandons the Generating Facility. SCE shall deem the Generating Facility to be abandoned if (i) SCE determines, in its sole opinion, that the Generating Facility is non-operational, (ii) SCE provides Producer with Notice of its intent to terminate this Agreement as a result of Producer's apparent abandonment of the Generating Facility, and (iii) Producer does not respond by affirming Producer's intent and ability to continue to operate the Generating Facility.
 - (e) Producer makes a change to the physical configuration of the Generating Facility, as declared in Section 2 and Appendix A of this Agreement.
- 4.3 Notwithstanding any other provisions of this Agreement, SCE shall have the right to unilaterally file with the Commission, pursuant to the Commission's rules and regulations, an application to terminate this Agreement.
- 4.4 Any agreements attached to and incorporated into this Agreement shall terminate concurrently with this Agreement unless the Parties have agreed otherwise in writing.

5. GENERATING FACILITY OPERATING REQUIREMENTS
- 5.1 Producer is responsible for operating the Generating Facility in compliance with all of SCE's tariffs, including but not limited to SCE's Electric Rule 21, and any other regulations and laws governing the interconnection of the Generating Facility.
- 5.2 Unless otherwise agreed upon in writing by the Parties, this Agreement does not provide for, nor otherwise require SCE to purchase, transmit, distribute, or store the electrical energy produced by Producer's Generating Facility.
- 5.3 Except for that energy delivered to SCE through net energy metering, the electric power produced by Producer's Generating Facility shall be used solely to serve electrical loads connected to the electric service account that SCE uses to interconnect Producer's Generating Facility. Producer shall not use the Generating Facility to serve electrical loads that will cause Producer to be considered an "electrical corporation" as such term is used in Section 218 of the Public Utilities Code.
- 5.4 Producer shall: (a) maintain the Generating Facility and Interconnection Facilities in a safe and prudent manner and in conformance with all applicable laws and regulations including, but not limited to, Section 5.1, and (b) obtain any governmental authorizations and permits required for the construction and operation of the Generating Facility and Interconnection Facilities. Producer shall reimburse SCE for any and all losses, damages, claims, penalties, or liability it incurs as a result of Producer's failure to obtain or maintain any governmental authorizations and permits required for construction and operation of Producer's Generating Facility.
- 5.5 Producer shall not commence parallel operation of the Generating Facility until SCE has provided express written approval. Such approval shall normally be provided per the timelines established by the applicable PUC Section, or by Electric Rule 21. Such approval will be provided after SCE's receipt of: (1) a completed Generating Facility Interconnection Application including all supporting documents and payments as described in the Application or Electric Rule 21; (2) any required NEM supplemental application forms; (3) a signed and completed Agreement; (4) a copy of Producer's final inspection clearance from the governmental authority having jurisdiction over the Generating Facility; and (5) submission of all applicable payments for reviews, studies, Interconnection Facilities, and Distribution System modifications. Such approval will not be unreasonably withheld. SCE shall have the right to have representatives present at the Commissioning Test as defined in Electric Rule 21. Producer shall notify SCE at least five (5) days prior to initial testing.
- 5.6 In no event shall the delivery of the maximum electric power to SCE's Distribution System exceed the amount or other limitations specified in Section 2 and Appendix A of this Agreement. If Producer does not regulate its Generating Facility in compliance with the limitations set forth in this Agreement, SCE may require Producer to disconnect its Generating Facility from SCE's Distribution System until Producer demonstrates to SCE's sole satisfaction that Producer has taken adequate measures to regulate the output of its Generating Facility and control its deliveries of electric power to SCE. Further, should SCE determine that Producer's operation of the Generating Facility is causing an unsafe condition or is adversely affecting SCE's ability to utilize its Distribution System in any manner, even if Producer's deliveries of electric power to SCE's Distribution system are within the limitations specified in this Agreement, SCE may require Producer to temporarily or permanently reduce or cease deliveries of electric power to SCE's Distribution System. Producer's failure to comply with the terms of this Section shall constitute a material breach of this Agreement and SCE may initiate termination in accordance with the terms of Section 4.2(b).

- 5.7 Producer shall not deliver reactive power to SCE's Distribution System unless the Parties have agreed otherwise in writing.
- 5.8 The Generating Facility shall be operated with all of the Producer's Protective Functions in service whenever the Generating Facility is operated in parallel with SCE's Distribution System. Any deviation from these requirements may occur only when the Parties have agreed to such deviations in writing.
- 5.9 If Producer declares that its Generating Facility meets the requirements for "Cogeneration" as such term is used in Section 216.6 of the Public Utilities Code (or successor definition of "Cogeneration") ("Cogeneration Requirement"), Producer warrants that, beginning on the date of Initial Operation and continuing throughout the term of this Agreement, its Generating Facility shall continue to meet such Cogeneration Requirements, per Appendix D of this Agreement.
- 5.10 If Producer's Generating Facility includes an energy storage device, Distribution Provider may provide requirements that must be met by the Producer prior to initiating parallel operation with SCE's Distribution System and throughout the term of this Agreement, including but not limited to the requirements set forth in Appendix H of this Agreement.
- 5.11 Producers interconnecting inverter-based Generating Facilities are required to comply with the requirements of Section Hh of SCE's Electric Rule 21, including configuration of protective settings in accordance with the specifications therein. Verification of compliance with such requirements shall be provided by the Producer upon request by SCE in accordance with SCE's Electric Rule 21.

6. INTERCONNECTION FACILITIES

- 6.1 Producer and/or SCE, as appropriate, shall provide Interconnection Facilities that adequately protect SCE's Distribution System, personnel, and other persons from damage or injury which may be caused by the operation of Producer's Generating Facility.
- 6.2 Producer shall be solely responsible for the costs, design, purchase, construction, operation, and maintenance of the Interconnection Facilities that Producer owns.
- 6.3 If the provisions of SCE's Electric Rule 21, or any other tariff approved by the Commission, require SCE to own and operate a portion of the Interconnection Facilities, Producer and SCE shall promptly execute an agreement that establishes and allocates responsibility for the design, installation, operation, maintenance, and ownership of the Interconnection Facilities. This agreement shall be attached to and made a part of this Agreement as Appendix B.
- 6.4 The Interconnection Facilities may include Net Generation Output Metering for determination of standby charges and applicable non-bypassable charges, and/or other meters required for SCE's administration and billing pursuant to SCE's tariffs for NEM.

7. LIMITATION OF LIABILITY

Each Party's liability to the other Party for any loss, cost, claim, injury, liability, or expense, including reasonable attorney's fees, relating to or arising from any act or omission in its performance of this Agreement, shall be limited to the amount of direct damage actually incurred. In no event shall either Party be liable to the other Party for any indirect, special, consequential, or punitive damages of any kind whatsoever.

8. INSURANCE

- 8.1 In connection with Producer's performance of its duties and obligations under this Agreement, Producer shall maintain, during the term of this Agreement, commercial general liability insurance with a limit of:
 - (a) Two million dollars (\$2,000,000) for each occurrence if the Gross Nameplate Rating of Producer's Generating Facility is greater than one

(P)
(P)

- hundred (100) kW;
- (b) One million dollars (\$1,000,000) for each occurrence if the Gross Nameplate Rating of Producer's Generating Facility is greater than twenty (20) kW and less than or equal to one hundred (100) kW;
 - (c) Five hundred thousand dollars (\$500,000) for each occurrence if the Gross Nameplate Rating of Producer's Generating Facility is greater than ten (10) kW and less than or equal to twenty (20) kW; and
 - (d) One hundred thousand dollars (\$100,000) for each occurrence if the Gross Nameplate Rating of Producer's Generating Facility is ten (10) kW or less and Producer's Generating Facility is connected to an account receiving residential service from SCE. If the Producer's Generating Facility is ten (10kW) kW or less and is connected to an account receiving residential service from SCE, then Producer may meet the insurance requirement in this Section 8.1 under their Personal Liability insurance coverage maintained within their Homeowners, Renters or other such personal lines insurance policy, and Producer is not required to maintain a commercial general liability insurance policy. (P)
- Such commercial general liability insurance shall include coverage for Premises-Operations and Contractual Liability. (P)
- 8.2 The commercial general liability insurance required in Section 8.1 shall, by endorsement to the policy or within the policy general condition itself, (a) include SCE as an additional insured; (b) contain a severability of interest clause or cross-liability clause; (c) provide that SCE shall not by reason of its inclusion as an additional insured incur liability to the insurance carrier for payment of premium for such insurance; (d) be primary and not in excess to or contributing with any insurance or self-insurance maintained by SCE; (e) grant waiver of subrogation in favor of SCE; and (f) provide for thirty (30) calendar days' written notice to SCE prior to cancellation, termination, alteration, or material change of such insurance. The requirements of this Section 8.2 shall not apply to Producers whose Generating Facility is under ten (10) kW or less and is connected to an account receiving residential service from SCE, as outlined in Section 8.1 (d). (P)
- 8.3 If Producer's Generating Facility employs only solar or wind generators under 1 MW and the requirement of Section 8.2(a) prevents Producer from obtaining the insurance required in Section 8.1, then upon Producer's written Notice to SCE in accordance with Section 9.1, the requirements of Section 8.2 shall be waived. However, to the extent that Producer has currently in force Commercial General Liability or Personal (Homeowner's) Liability insurance, Producer agrees that it will maintain such insurance in force for the duration of this Agreement in no less than amounts currently in effect. (P)
- 8.4 [Intentionally Blank] (P)
- 8.5 Producer agrees to furnish evidence of insurance (certificates of insurance and endorsements as appropriate) to SCE prior to Parallel Operation and thereafter for each insurance policy renewal during the term of this Agreement. SCE shall have the right to inspect or obtain a copy of the original policy or policies of insurance. (P)
- 8.6 If Producer is self-insured with an established record of self-insurance, Producer may comply with the following in lieu of Sections 8.1 through 8.2: (T)
- (a) Producer shall provide to SCE, at least thirty (30) calendar days prior to the date of Parallel Operation, evidence of an acceptable plan to self-insure to a level of coverage equivalent to that required under Section 8.1.
 - (b) If Producer ceases to self-insure to the level required hereunder, or if Producer is unable to provide continuing evidence of Producer's ability to self-insure, Producer agrees to immediately obtain the insurance coverage required under Section 8.1 and 8.2 above. (T)
- 8.7 All insurance policies, certificates of insurance, statements of self-insurance, (T)

endorsements, cancellations, terminations, alterations, and material changes of such insurance shall be issued and submitted to the following:

Southern California Edison Company
Attention:
2244 Walnut Grove Avenue
P.O. Box 800
Rosemead, CA 91770

9. NOTICES

9.1 Any written notice, demand, or request required or authorized in connection with this Agreement (“Notice”) shall be deemed properly given if delivered in person or sent by first class mail, postage prepaid, to the person specified below:

If to SCE: Southern California Edison Company
Attention:
2244 Walnut Grove Avenue
P.O. Box 800

Rosemead, CA 91770

Phone: () _____

Fax: () _____

If to Producer: Name: Antelope Valley Water Storage
Attention: Mark Beuhler, GM
Address: 1672 W J Ave
City: Rosamond, CA 93534
Phone: (323) 860.4829
FAX: (323) 860.4829
Please complete

- 9.2 A Party may change its address for Notice at any time by providing the other Party Notice of the change in accordance with Section 9.1.
- 9.3 The Parties may also designate operating representatives to conduct the daily communications, which may be necessary or convenient for the administration of this Agreement. Such designations, including names, addresses, and phone numbers may be communicated or revised by one Party's Notice to the other.

10. REVIEW OF RECORDS AND DATA

- 10.1 SCE shall have the right to review and obtain copies of Producer's operations and maintenance records, logs, or other information such as unit availability, maintenance outages, circuit breaker operation requiring manual reset, relay targets and unusual events pertaining to Producer's Generating Facility or its interconnection with SCE's Distribution System.
- 10.2 Producer authorizes SCE to release to the California Energy Commission ("CEC") and/or the Commission information regarding the Generating Facility, including the Producer's name and location, and the size, location and operational characteristics of the Generating Facility, as requested from time to time pursuant to the CEC's or Commission's rules and regulations.

11. ASSIGNMENT

Producer shall not voluntarily assign its rights or delegate its duties under this Agreement without SCE's written consent. Any assignment or delegation Producer makes without SCE's written consent shall not be valid. SCE shall not unreasonably withhold its consent to Producer's assignment of this Agreement.

12. NON-WAIVER

None of the provisions of this Agreement shall be considered waived by a Party unless such waiver is given in writing. The failure of a Party to insist in any one or more instances upon strict performance of any of the provisions of this Agreement or to take advantage of any of its rights hereunder shall not be construed as a waiver of any such provisions or the relinquishment of any such rights for the future, but the same shall continue and remain in full force and effect.

13. GOVERNING LAW, JURISDICTION OF COMMISSION, INCLUSION OF SCE's TARIFF SCHEDULES, DEFINED TERMS

13.1 This Agreement shall be interpreted, governed, and construed under the laws of the State of California as if executed and to be performed wholly within the State of California without giving effect to choice of law provisions that might apply to the law of a different jurisdiction.

13.2 This Agreement shall, at all times, be subject to such changes or modifications by the Commission as it may from time to time direct in the exercise of its jurisdiction.

13.3 The interconnection and services provided under this Agreement shall at all times be subject to the terms and conditions set forth in the tariffs applicable to the electric service provided by SCE. Copies of such tariffs are available at SCE's Internet site: www.sce.com or by request to SCE and are incorporated into this Agreement by this reference.

13.4 Notwithstanding any other provisions of this Agreement, SCE shall have the right to unilaterally file with the Commission, pursuant to the Commission's rules and regulations, an application for change in tariffs, rates, charges, classification, service, or any agreement relating thereto.

14. AMENDMENT AND MODIFICATION

This Agreement can only be amended or modified by a written agreement signed by both Parties. SCE shall determine in its sole discretion whether prior Commission approval is required for such amendments or modifications.

15. TRANSITION PROVISIONS FOR ELIGIBLE GENERATORS

Producers receiving service on the current NEM tariffs pursuant to PUC Section 2827 (i.e., Schedule NEM) prior to SCE reaching its NEM trigger level or July 1, 2017, whichever is earlier, are subject to the transition provisions as outlined in the applicable NEM rate schedule. Producers receiving service on the successor NEM tariffs pursuant to PUC Section 2827.1 and Commission Decision 16-01-044 (i.e., Schedule NEM-ST) are subject to the transition provisions as outlined in the applicable NEM successor tariff rate schedule.

16. ENTIRE AGREEMENT

This Agreement, including any incorporated tariff schedules and rules, contains the entire agreement and understanding between the Parties, their agents, and employees as to the subject matter of this Agreement. Each party also represents that in entering into this Agreement, it has not relied on any promise, inducement, representation, warranty, agreement or other statement not set forth in this Agreement or in the incorporated tariff schedules and rules.

17. SIGNATURES

This Agreement may be executed in counterparts, and by Electronic Signature on the part of SCE and/or the Customer, and copies of a Party's signed signature page may be transmitted to the other Party by facsimile or other electronic means. Copies of the signature page so transmitted may be used for the purpose of enforcing the terms of this Agreement as though they were originals and will not be made inadmissible in any legal or regulatory proceeding concerning this Agreement on the basis of the Best Evidence Rule or similar rule of admissibility.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed by their duly authorized representatives. This Agreement is effective as provided in Section 4.1 above.

[Please note the individual signing this Agreement must be duly authorized to bind the Producer to its terms. Accordingly, unless the individual is an "owner of a proprietorship", "officer of a corporation," "director or general manager of an agency," or an equivalent official, please also provide documentation showing the signature authority of the individual who does sign on behalf of the "Producer"].

PRODUCER NAME

**SOUTHERN CALIFORNIA
EDISON COMPANY**

By:

By:

Name:

Name:

Title:

Title:

Date:

Date:

APPENDIX A

**DESCRIPTION OF GENERATING FACILITY
AND SINGLE-LINE DIAGRAM**

(Provided by Producer)

(Note: The Description of the Generating Facility should include, but not be limited to, for each of the technology types of generation: spatial configuration, net and gross nameplate ratings, manufacturer, if the generators are certified under Electric Rule 21, protection equipment, and intended mode of operation (i.e., non-export; inadvertent export; and continuous export, where applicable). Additionally, points of interconnection with SCE, as well as locations and type of protection equipment and disconnect switches should be identified.)

APPENDIX B

Electric Rules “2” and “21”

(Note: SCE's Electric Rules 2 and 21 may be subject to such changes or modifications by the Commission as the Commission may, from time to time, direct in the exercise of its jurisdiction. SCE's tariffs, including Rules 2 and 21 can be accessed via the SCE website at www.sce.com/regulatory. Upon request, SCE can provide copies to Producer of Rules 2 and 21.

APPENDIX C
(If Applicable)

INTERCONNECTION FACILITIES FINANCING AND OWNERSHIP AGREEMENT
(Provided by SCE)

APPENDIX D

(When Applicable)

PRODUCER'S WARRANTY THAT THE GENERATING FACILITY IS A "COGENERATION" FACILITY PURSUANT TO SECTION 216.6 OF THE CALIFORNIA PUBLIC UTILITIES CODE

For the purpose of securing the Competition Transition Charge exemption available under Section 372 of the California Public Utilities Code, Producer hereby declares that the Generating Facility meets the requirements for "Cogeneration" as such term is used in Section 216.6 of the California Public Utilities Code ("Cogeneration Requirements").

Producer warrants that, beginning on the date of Parallel Operation and continuing throughout the term of this Agreement, its Generating Facility shall continue to meet the Cogeneration Requirements. If Producer becomes aware that the Generating Facility has ceased to meet the Cogeneration Requirements, Producer shall promptly provide SCE with Notice of such change pursuant to Section 9.1 of the Agreement. If at any time during the term of this Agreement SCE determines in its sole discretion that Producer's Generating Facility may no longer meet the Cogeneration Requirements, SCE may require Producer to provide evidence that the Generating Facility continues to meet the Cogeneration Requirements, within 15 business days of SCE's request for such evidence. Additionally, SCE may periodically (typically, once per year) inspect Producer's Generating Facility and/or require documentation from Producer to monitor the Generating Facility's compliance with the Cogeneration Requirements. If SCE determines in its sole judgment that Producer either failed to provide evidence in a timely manner or that it provided insufficient evidence that its Generating Facility continues to meet the Cogeneration Requirements, then the Cogeneration status of the Generating Facility shall be deemed ineffective until such time as Producer again demonstrates to SCE's reasonable satisfaction that the Generating Facility meets the requirements for a Cogeneration facility (the "Cogeneration Status Change").

SCE shall revise its records and the administration of this Agreement to reflect the Cogeneration Status Change and provide Notice to Producer of the Cogeneration Status Change pursuant to Section 9.1 of this Agreement. Such Notice shall specify the effective date of the Cogeneration Status Change. This date shall be the first day of the calendar year for which SCE determines in its sole discretion that the Generating Facility first ceased to meet the Cogeneration Requirements. SCE shall invoice the Producer's Electric Service Account through which the Generating Facility is Interconnected with SCE's Distribution System for Competition Transition Charges (CTCs) that were not previously billed during the period between the effective date of the Cogeneration Status Change and the date of the Notice in reliance upon Producer's representations that the Generating Facility complied with the Cogeneration Requirements and therefore was eligible for the exemption from CTCs available under Section 372 of the California Public Utilities Code.

Any amounts to be paid or refunded by Producer, as may be invoiced by SCE pursuant to the terms of this warranty, shall be paid to SCE within 30 days of Producer's receipt of such invoice.

APPENDIX E
(If Applicable)

**LIST OF ELIGIBLE ACCOUNTS
TO BE INCLUDED IN NET ENERGY METERING CALCULATIONS
PURSUANT TO SCHEDULE BG-NEM OR FC-NEM**

(Please provide a copy of a recent billing statements for each of the accounts (if any) to be included in this listing. Indicate the priority order you wish SCE to use in applying surplus energy credits.)

Account Priority ¹	Account Name ²	Service Address ²	SCE Service Account Number ²	SCE Meter Number ²	SCE TOU Tariff Schedule ²
1					
2					
3					
4					
5					
6					

Notes:

1. Account Priority: See Load Aggregation provisions of Schedule BG-NEM and FC-NEM. Accounts are listed in priority designated by Producer to receive excess generation credits. The "Host Account," described on page 1 of this agreement, should not be included in this listing.
2. Account information as shown on SCE billing statement.

APPENDIX F
(If Applicable)

**LIST OF ELIGIBLE ACCOUNTS
TO BE INCLUDED IN NET ENERGY METERING AGGREGATION CALCULATIONS
PURSUANT TO SCHEDULES NEM OR NEM-ST**

Primary/Generating Account Name	Service Account No.	Account Address	Annual kWh Load	Estimated Annual kWh Production	Bundled, DA or CCA Service

(T)

Aggregated Account Name	Service Account No.	Account Address	Annual kWh Load	Bundled, DA or CCA Service
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
Please attach additional sheets with aggregated account information, if necessary.				

(T)

(T)

(T)

(T)

(T)

(T)

(T)

(T)

(T)

(T)

APPENDIX G
(If Applicable)

**PRODUCER WARRANTY AND VERIFIED EQUIPMENT REQUIREMENTS APPLICABLE TO
GENERATING FACILITIES REQUESTING INTERCONNECTION PURSUANT TO THE
PROVISIONS OF THE NEM SUCCESSOR TARIFFS (i.e., SCHEDULE NEM-ST)**

For Producers interconnecting a Generating Facility under the provisions of Schedule NEM-ST, the Generating Facility must have a warranty of at least 10 years for all equipment and the associated installation from the system provider. In appropriate circumstances conforming to industry practice, this requirement may rely on and be satisfied by manufacturers' warranties for equipment and separate contractors' warranties for workmanship (i.e., installation). Warranties or service agreements conforming to requirements applicable to the Self-Generation Incentive Program ("SGIP") may also be used for technologies eligible for the SGIP.

For Producers interconnecting a solar Generating Facility under the provisions of Schedule NEM-ST, all major solar system components (including PV panels and other generation equipment, inverters and meters) must be on the verified equipment list maintained by the California Energy Commission ("CEC"). For all NEM-ST Generating Facilities, any other equipment, as determined by SCE, must be verified as having safety certification from a Nationally Recognized Testing Laboratory ("NRTL").

APPENDIX H
(If Applicable)

The following Operating Requirement(s) apply to the charging functions of the Generating Facility:

- Producer's storage device(s) will not consume power from Distribution Provider's Distribution System at any time.
- Producer's storage device(s) will not cause the Host Load to exceed its normal peak demand. Normal peak demand is defined as the highest amount of power required from the Distribution System by Producer's complete facilities without the influence or use of the energy storage device(s).
- To avoid upgrades or other technical mitigation items identified in the interconnection process, Producer has chosen the following Generating Facility operating constraint(s):

For the annual period between _____ [Month/Day] and _____ [Month/Day]
 And during the hours of _____
 The storage device(s) will consume no more than a total of ___ kW from the Distribution System.
 This operating constraint voids the need for the following specific mitigation scope:

No other charging function limitation is required for this Generating Facility except the requirements above. Producer will be responsible for the costs of the corresponding upgrades or other technical mitigations if at any time the Producer elects to forego or violates the operating requirement.

Consistent with current load service Rules, Distribution Provider is not required to reserve capacity for load. Producer is responsible to contact the utility for any modification to its equipment or change in operations that may result in increased load demand per Electric Rule 3.C.

If any operating requirement is specified above, Distribution Provider reserves the right to ask for data at the 15-minute interval level at any time to verify that the operating requirement is being met. Distribution Provider will make such request via a written notice no more than once per calendar quarter. Producer must provide such data within 30 Calendar Days of the written request.

If the Generating Facility fails to adhere to the operating requirements at any time, it will be disconnected immediately in accordance with Rule 21 Section D.9 and not reconnected until an approved mitigation (e.g., supervising controls) is in place as determined by Distribution Provider.

APPENDIX I
(If Applicable)

PRODUCER'S WARRANTY THAT IT MEETS THE REQUIREMENTS FOR AN ELIGIBLE FUEL CELL CUSTOMER-GENERATOR AND THE GENERATING FACILITY IS AN ELIGIBLE FUEL CELL ELECTRICAL GENERATING FACILITY PURSUANT TO SECTION 2827.10 OF THE CALIFORNIA PUBLIC UTILITIES CODE

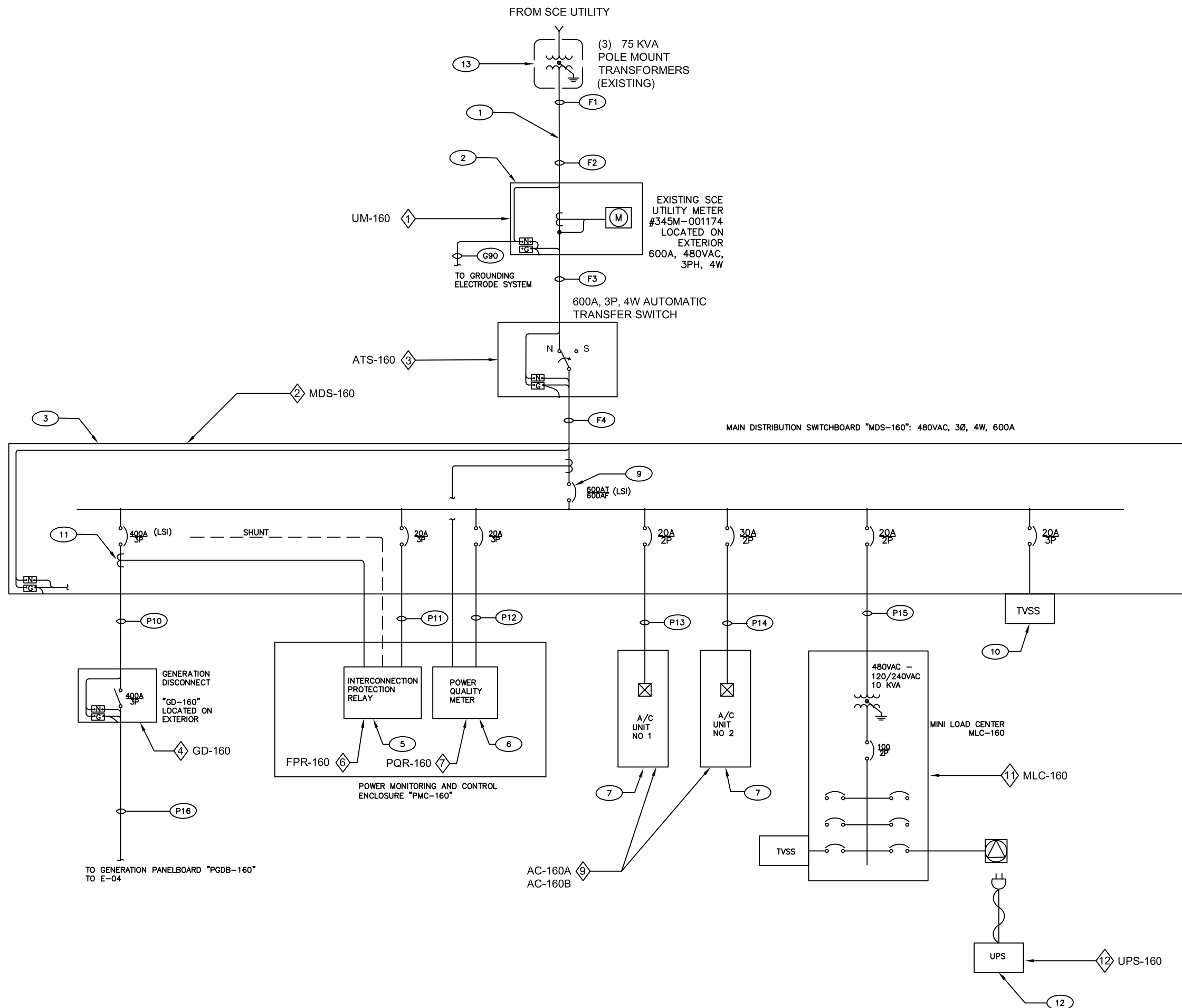
Producer has declared that it meets the requirements for an Eligible Fuel Cell customer-generator and the Generating Facility meets the requirements of an "Eligible Fuel Cell Electrical Generating Facility", as defined section 2827.10 of the California Public Utilities Code ("Eligibility Requirements").¹

Producer warrants that, beginning on the date of Initial Operation and continuing throughout the term of this Agreement, Producer and the Generating Facility shall continue to meet the Eligibility Requirements. If Producer or the Generating Facility ceases to meet the Eligibility Requirements, Producer shall promptly provide SCE with Notice of such change pursuant to Section 9.1 of this Agreement. If, at any time during the term of this Agreement, SCE determines, in its sole discretion, that Producer or Generating Facility may no longer meet the Eligibility Requirements, SCE may require Producer to provide evidence that Producer and/or the Generating Facility continues to meet the Eligibility Requirements, within 15 business days of SCE's request for such evidence. Additionally, SCE may periodically (typically, once per year) inspect Producer's Generating Facility and/or require documentation from Producer to monitor the Generating Facility's compliance with the Eligibility Requirements. If SCE determines in its sole judgment that Producer either failed to provide evidence in a timely manner or that it provided insufficient evidence that its Generating Facility continues to meet the Eligibility Requirements, then the Eligibility Status shall be deemed ineffective until such time as Producer again demonstrates to SCE's reasonable satisfaction that Producer meets the requirements for an Eligible Fuel Cell customer-generator and/or the Generating Facility meets the requirements for a Eligible Fuel Cell electrical generating facility (the "Eligibility Status Change"). SCE shall revise its records and the administration of this Agreement to reflect the Eligibility Status Change and provide Notice to Producer of the Eligibility Status Change pursuant to Section 9.1 of this Agreement. Such Notice shall specify the effective date of the Eligibility Status Change. This date shall be the first day of the calendar year for which SCE determines in its sole discretion that the Producer and/or Generating Facility first ceased to meet the Eligibility Requirements. SCE shall invoice the Producer for any tariff charges that were not previously billed during the period between the effective date of the Eligibility Status Change and the date of the Notice in reliance upon Producer's representations that Producer and/or the Generating Facility complied with the Eligibility Requirements and therefore was eligible for the rate treatment available under the Net Energy Metering provisions of SCE's Schedule FC-NEM, Fuel Cell Net Energy Metering.

Any amounts to be paid or refunded by Producer, as may be invoiced by SCE pursuant to the terms of this warranty, shall be paid to SCE within 30 days of Producer's receipt of such invoice.

¹ Pursuant to Special Condition 9 of Schedule FC-NEM, Producers who submit all documentation necessary to receive service on Schedule FC-NEM, including the final electrical inspection clearance, after January 1, 2017 but before the California Air Resources Board (CARB) establishes, and the Commission approves as needed, the schedule of annual greenhouse gas (GHG) emissions reduction standards pursuant to Assembly Bill 1637 (Low, 2016) may be subject to the repayment of any interconnection costs, Departing Load charges, Standby charges, and the loss of NEM credits if their Generating Facilities do not meet the standards, once established (expected to be no later than March 31, 2017).

Appendix F. Single Line



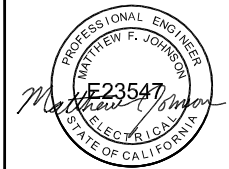
PROJECT LOCATION:
160 ST W
ROSAMOND, CA 93506.
APN # 359-041-17

SCE UTILITY SERVICE METER # :
345M-001174

SERVICE ACCOUNT # :
8002087301

SCE UTILITY POLE #:
1587233E & 1587234E

- NOTES:
- UTILITY POINT OF CONNECTION AT WEATHERHEAD
 - UTILITY SERVICE ENTRANCE RATED METERING
 - 600 AMP SERVICE RATED SWITCHBOARD: EATON POW-R-LINE
 - POWER GENERATION DISCONNECT: EATON SAFETY SWITCH
 - INTERCONNECTION PROTECTION RELAY SEL 751 RELAY: MEETS IEEE 1547-STANDARD FOR INTERCONNECTION & INTEROPERABILITY OF DISTRIBUTED ENERGY RESOURCES W/ ASSOCIATED ELECTRIC POWER SYSTEMS INTERFACES. VOLTAGE, PHASE & GROUND FAULT DETECTION
 - POWER QUALITY METER: SEL 735: VOLTAGE, CURRENT, POWER FACTOR, IEEE 519 COMPLIANCE TRENDING
 - MINI SPLIT A/C UNIT
 - MINI LOAD CENTER
 - SHUNT TRIP ENTRANCE RATER CIRCUIT BREAKER CONTROLLED BY PLC
 - TVSS UNIT SUPPLIED INTEGRAL TO MAIN DISTRIBUTION SWITCHBOARD (MDS-152)
 - CURRENT TRANSFORMER
 - CONTROL SYSTEM STANDBY POWER UPS
 - TRANSFORMER SIZE (KVA) TO BE CONFIRMED FROM SCE UTILITY INFORMATION REQUEST RESPONSE



WAPTIC CONSULTING

2207 W. DAKOTA | Hayden, ID 83835
www.wapti-consulting.com
(208) 651-1120

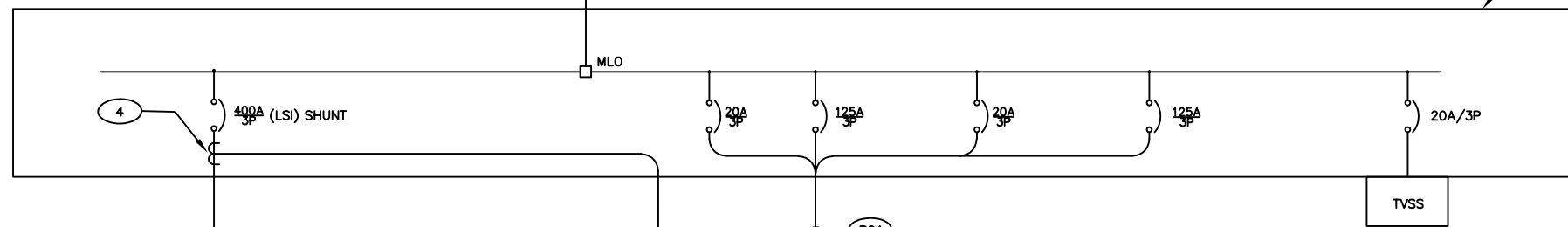
NO.	DATE	REVISION	BY
01			
DWG TITLE			
WSWB APH-1 50KW ENERGY STORAGE ONE LINE DIAGRAM			
ENGINEER	MPJ	CHECKED BY	MPJ
JOB NO	M21-510	DRAWN BY	NEK
SCALE	NO SCALE	DATE	04/21/2022
DWG NO	E-03		
SHEET NO	3 OF 28		

C:\USERS\KORTE\ONEDRIVE\DOCUMENTS\ACADE 2017\AEDATA\PRO\CEC ASR POWER REGENERATION\E-02 CEC ASR REGEN ONE LINE DIAGRAM.DWG

FROM MAIN SWITCHBOARD "MSB-160" TO E-03

5 PG DSB-160

POWER GENERATION DISTRIBUTION SWITCHBOARD "PGDSB-160": 480 VAC, 3Ø, 4W, 400A



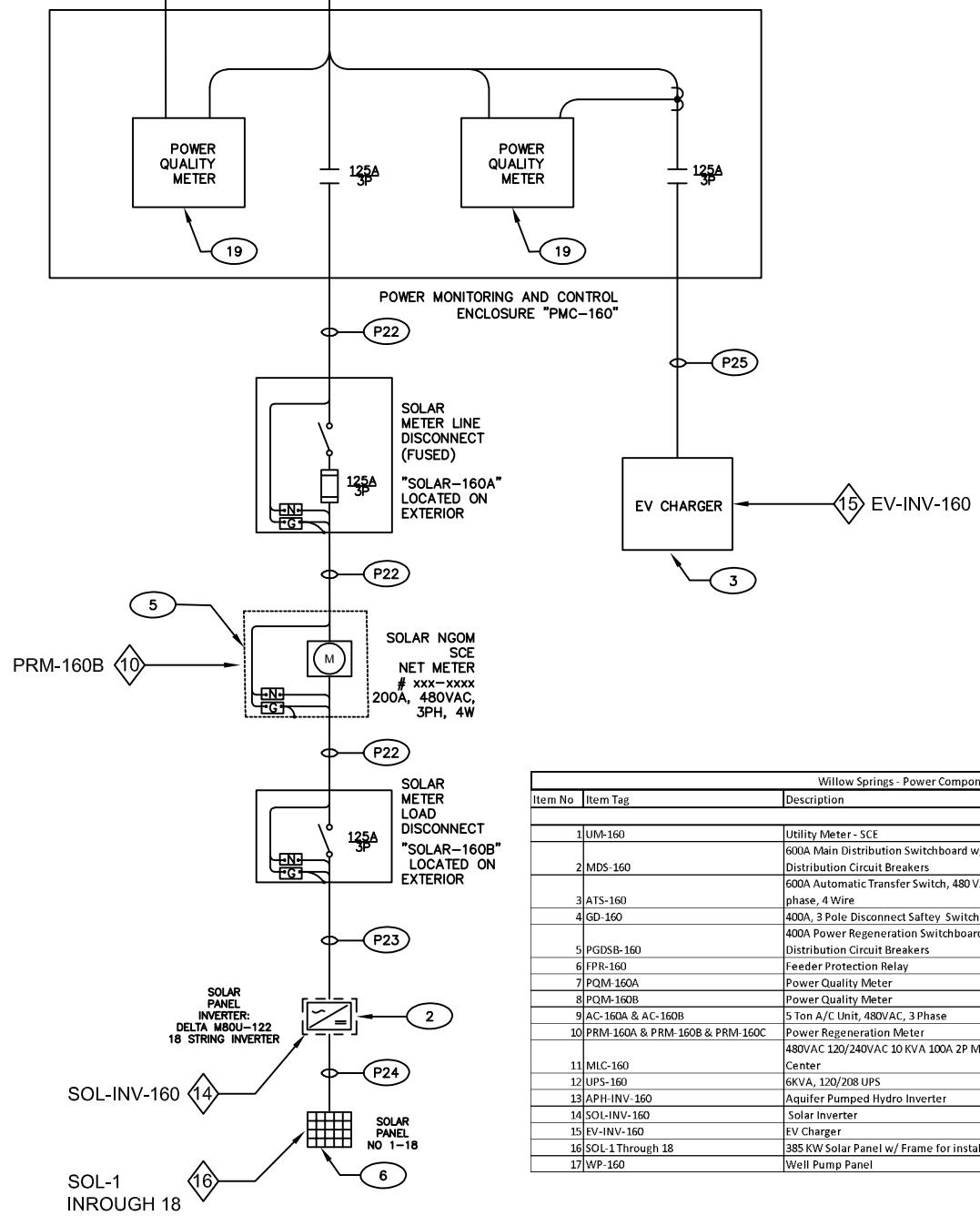
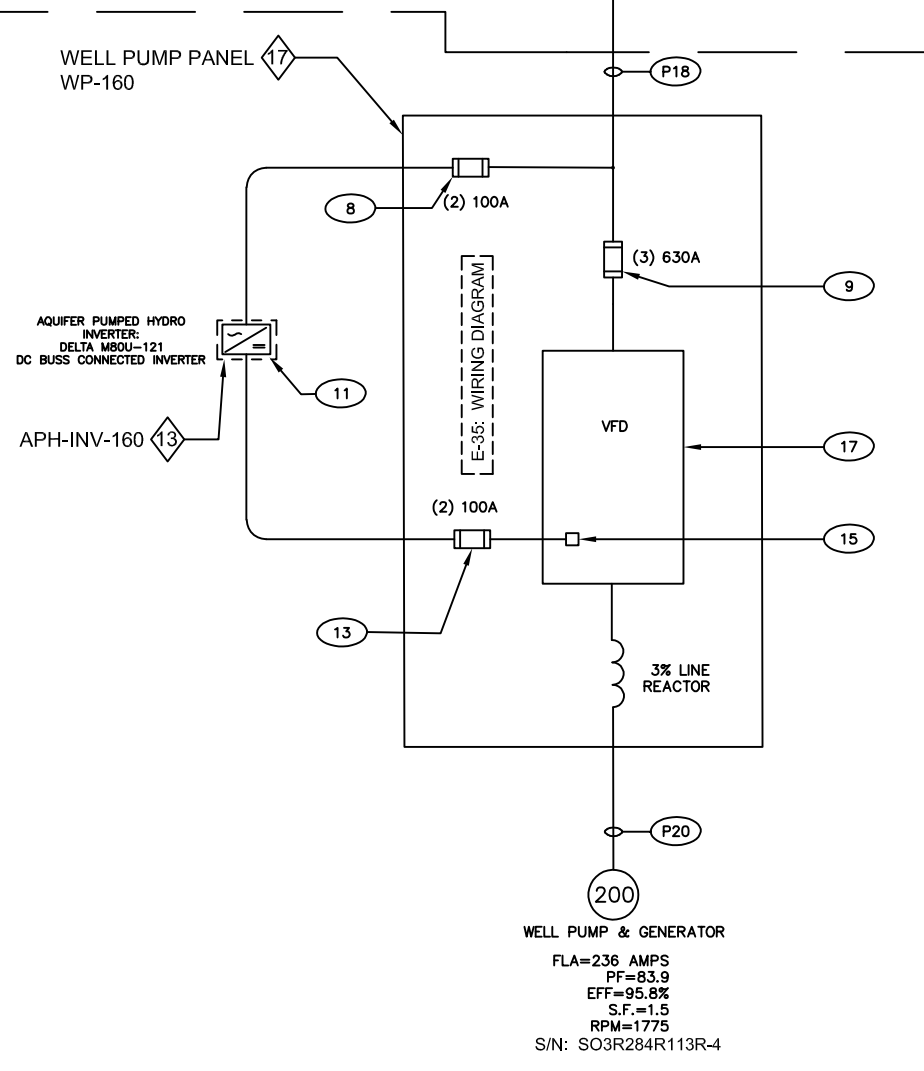
PROJECT LOCATION:
160 ST W
ROSAMOND, CA 93506.
APN # 359-041-17

NOTES:

- 1: SWITCHBOARD EATON POW-R-LINE
- 2: SOLAR INVERTER DELTA M80U-122
- 3: ELECTRIC VEHICLE (EV) CHARGING STATION DELTA EVHN503
- 4: CURRENT TRANSFORMER
- 5: POWER REGENERATION METER ENCLOSURE: BLINE- U122015 (FUTURE IF REQUIRED)
- 6: 18 STRINGS OF SOLAR PANELS: URECO : D7M385H8A
- 7: NOT USED
- 8: LINE FUSE: MERSEN-PC73UD13C630TF
- 9: LINE FUSE: MERSEN-PC73UD13C630TF
- 10: NOT USED
- 11: AQUIFER PUMPED HYDRO INVERTER DELTA M80U-121
- 12: NOT USED
- 13: DC FUSE: BUSMAN 170M6277 FOR SHORT CIRCUIT PROTECTION ONLY
- 14: DC FUSE: BUSMAN 170M6277 FOR SHORT CIRCUIT PROTECTION ONLY
- 15: DC BUSS
- 16: DC FUSE: BUSMAN 170M6277 FOR SHORT CIRCUIT PROTECTION ONLY
- 17: WELL MOTOR VFD: DAN FOSS NXP03005-A5T1BSG-A1A2000000.
- 18: NOT USED
- 19: POWER QUALITY METER: SEL735: VOLTAGE, CURRENT, POWER FACTOR, IEEE519 COMPLIANCE TRENDING



AQUIFER PUMPED HYDRO



Willow Springs - Power Components Bill of Material - Refer to One-Line for additional information						
Item No	Item Tag	Description	Part Number	Manufacture	Supplier	Qty.
1	UM-160	Utility Meter - SCE	Included with MDS-160 Main Distribution Switchboard	Not Known	PB Electric	1
2	MDS-160	600A Main Distribution Switchboard w/ Distribution Circuit Breakers	N/A	Eaton	PB Electric	1
3	ATS-160	600A Automatic Transfer Switch, 480 VAC, 3 phase, 4 Wire	N/A	N/A	PB Electric	1
4	GD-160	400A, 3 Pole Disconnect Safety Switch	DH365NDKW	Eaton	PB Electric	1
5	PGDSB-160	400A Power Regeneration Switchboard w/ Distribution Circuit Breakers	N/A	Eaton	PB Electric	1
6	FPR-160	Feeder Protection Relay	SEL 751 001DBDOXOX85BCF0	Schweitzer Engineering	PB Electric	1
7	PQM-160A	Power Quality Meter	SEL 735 0735BX20544C16101	Schweitzer Engineering	PB Electric	1
8	PQM-160B	Power Quality Meter	SEL 735 0735BX20944C16101	Schweitzer Engineering	PB Electric	3
9	AC-160A & AC-160B	5 Ton A/C Unit, 480VAC, 3 Phase	N/A	N/A	PB Electric	2
10	PRM-160A & PRM-160B & PRM-160C	Power Regeneration Meter	Bline-U122015	B-Line Systems	PB Electric	3
11	MLC-160	480VAC 120/240VAC 10 KVA 100A 2P Mini Load Center	P48G1151024HCUB	Eaton	PB Electric	1
12	UPS-160	6KVA, 120/208 UPS	N/A	Eaton	PB Electric	1
13	APH-INV-160	Aquifer Pumped Hydro Inverter	M80U-121	Delta	PB Electric	1
14	SOL-INV-160	Solar Inverter	M80U-122	Delta	PB Electric	1
15	EV-INV-160	EV Charger	EVHN503	Delta	PB Electric	1
16	SOL-1 Through 18	385 KW Solar Panel w/ Frame for installation	D7K385H8A	Ureco	PB Electric	1
17	WP-160	Well Pump Panel	N/A	Wapiti	Wapiti	1

E 04 ONE-LINE DIAGRAM: REV 1 (2 OF 2)
NO SCALE

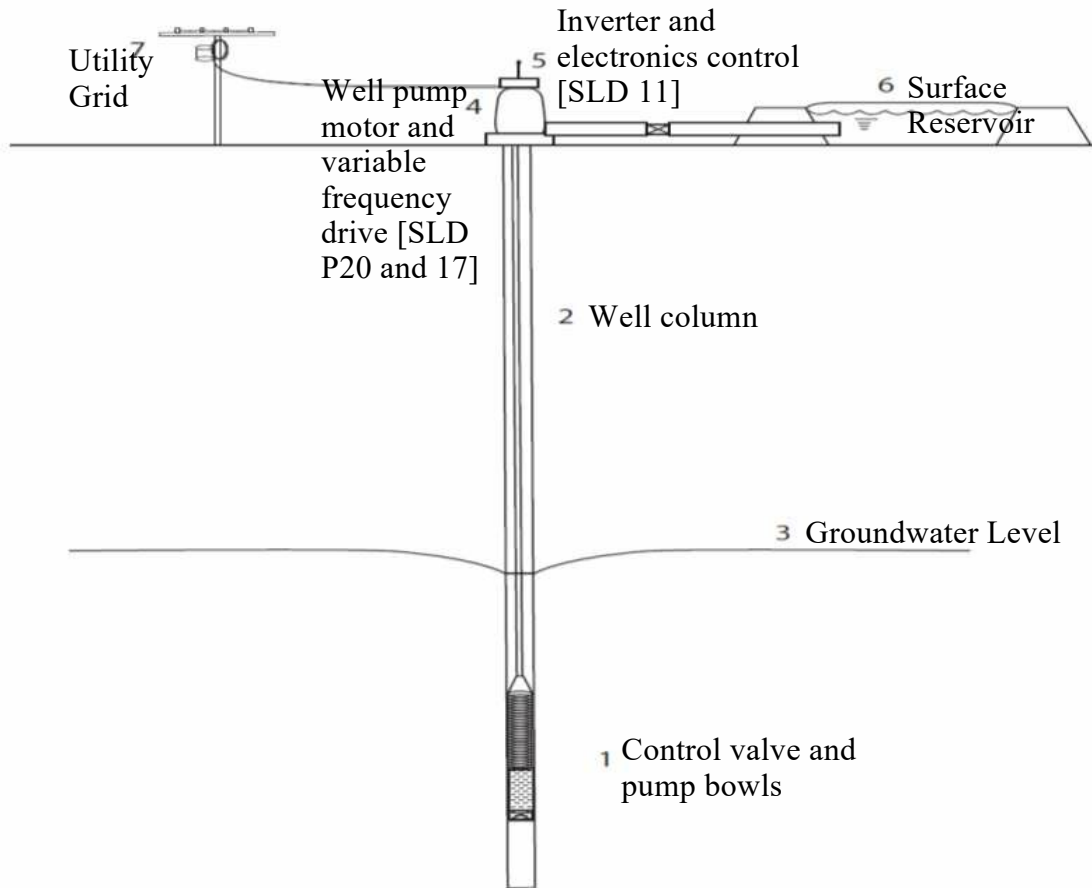
C:\USERS\KORTE\ONEDRIVE\DOCUMENTS\ACADE 2017\EDATA\PRO\CEC ASR POWER REGENERATION\E-02 CEC ASR REGEN ONE LINE DIAGRAM.DWG



NO.	DATE	REVISION	BY
01		160th & GASKELL	NK

WSWB APH-1
50KW
ENERGY STORAGE
ONE LINE DIAGRAM

ENGINEER: MFJ CHECKED BY: MFJ
JOB NO: M21-510 DRAWN BY: NEK
SCALE: NO SCALE DATE: 04/21/2022
SHEET NO: E-04
4 OF 28



Aquifer Pumped Hydro (APH) Schematic

Interconnection Request Gaskell and 160th

Type of IR

This Interconnection Request (IR) is virtually identical to the Gaskell/152nd one (NST-206659). The only difference is the well we are using for Aquifer Pumped Hydro (APH) is a different well right around the corner.

The type of interconnection being requested is NEM-MT-ST (NEM Multi-Tariff NEM + Non-Export) w/ the Export Addendum. This will allow the APH generator to export to the grid for testing purposes.

Relevant response to engineers can be found below so there is a complete record in this application.

Response to Engineers 11/09/2021

Provide inverter certifications for the Well Pump inverter. Also please highlight the exact model # and manufacturer of the inverter for the well pump.

* Delta M80U-121 inverters will be used. One for solar and one for APH generation Inverter certification: Solar Equipment List – CA Energy Commission.png. Characteristics source: “APH generation M80U.pdf”.

Will the Well Pump be non-export? If so, what Protection option from Rule 21 will be used ?

* No. This is an export project. The protection will be integral to the UL1741 SA listed Delta inverter. Source: “APH generation M80U.pdf”.

Protection Option 3 will be used. “a. “Option 3 (Certified Non-Islanding Protection): To ensure the incidental export of power is limited to acceptable levels, this option requires that all of the following conditions be met: a) the total Gross Capacity of the Generating Facility must be no more than 25% of the nominal ampere rating of Producer’s service equipment; b) the total Gross Capacity of the Generating Facility must be no more than 50% of Producer’s service transformer capacity rating (this capacity requirement does not apply to Customers taking primary service without an intervening transformer); and c) the Generating Facility must be Certified as Non-Islanding.”

Please highlight the 40 kW and the 500 kWh ESD ratings on the specsheet. We could not confirm these ratings from the submitted spec sheet.

The VFD and Inverter are not rated in KW. Both are rated based on amps. KW ratings on NET application are generated mathematically from the rated amps and system voltage. $P=IV$. Power (KW) = I (Current) x V(Voltage). The inverters operate at unity power factor, so the kW rating is 83 kW. Source: “APH generation M80U.pdf” last page, highlighted with red box.

Provide specification sheet for the Generator equipment from the manufacturer.

* The generator equipment is an EXISTING agricultural well pump motor. The only specifications available are the motor testing report from the manufacture and the motor nameplate information. We are attaching the SCE well pump test that provides operating information Source: “2021 well tests.pdf”.

Response to Engineers 11/29/2021

Main service panel rating (Ampere). **The main panel is rated 600 Amp.**

Provide the Well Pump inverter specification sheet. (The provided spec sheet is for M80U inverter model which is for the Solar). **Correct. The M80U-122 is labeled as a "Photovoltaic" or "Solar" inverter (APH-80U-122 – Datasheet.pdf). The M80U -121 comes with DC bus connections rather than multiple string inverter connections (APH-80U-121 – Datasheet.pdf). . See the attached installation manual for the M80U – 121 identifying the DC buss connections (M80U-121 – Wiring Instructions.pdf). We are connecting the inverter to the DC bus terminals of the VFD. The VFD DC bus will produce the DC voltage for the selected Smart Grid Inverter.**

Response to Engineers 12/21/2021

Inverter for Well pump , Inverter for the Solar PV, Solar PV generating equipment and the Well pump generating equipment .

1. **The Well Pump Inverter is shown on E-04 labeled as Note N11 – “Aquifer Pumped Hydro Inverter : Delta M80U-121 DC Bus Connected Inverter”.**
2. **The Well Pump Generation Equipment is shown on E-04 and is labeled the existing “Well Pump Motor & Generator”.**
3. **The Inverter for the Solar PV is shown on E-04 and is labeled as N2 – “Solar Panel Inverter : Delta M80U-122, 18 String Inverter”.**
4. **The PV generating equipment is shown on E-04 and shown as “Solar Panel 1-18.”**

Response to Engineers 1/3/2022

As part of the CEC study, we have to demonstrate the APH’s generating capability (in both KW and KWh). While we are planning to demonstrate that by sending the generation to the EV charger (using our internal meter) we also have to demonstrate that by sending power back to the Grid (through the utility meter). So yes, we need export to the grid for APH as well as for solar.

Response to Engineers 1/18/2022

There is only one thing out there - the well pump - run as either load or as a generator. There is no unique, separate hydro unit. We used the well pump nameplate in the application as it is the only nameplate there. If having the well nameplate info messes up your calculations please advise. On the attached we have calculated the generator parameters but one of the purposes of this CEC study is to determine exactly what those are when operating.

Response to Engineers 1/18/2022

Fastrack failed Screen M

I know you have your formula for Screen M but in this case it would be wrong. APH will not contribute to line loading on that distribution line. On the contrary, it will relieve the line loading there.

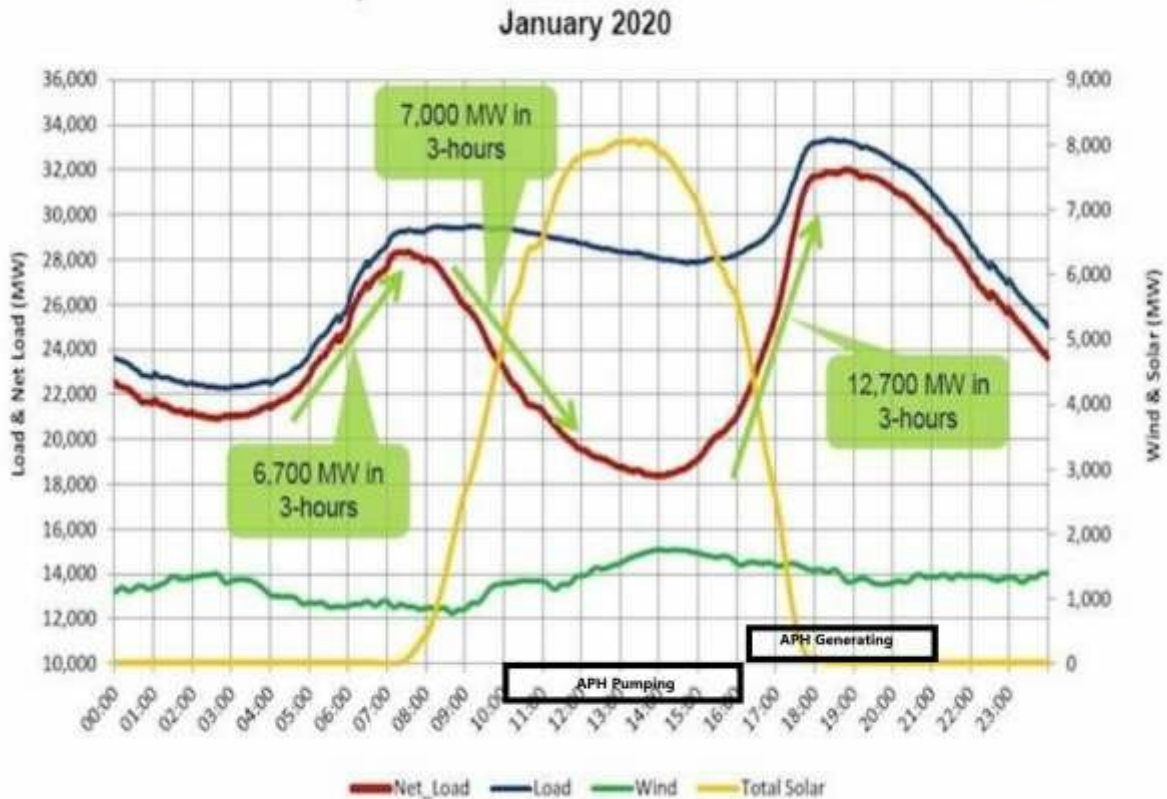
During the daylight hours APH will be consuming electricity (pumping water into storage), effectively unloading the line during peak solar generation times.

In the evening APH will be generating, using unused space on the line for its generation..

Take a look at the attached graphic that illustrates this.

For your Supplemental Review I'd have APH pumping (using electricity) for 8 hours per day (9:30-4:30) and generating for 5 hours (4:30-9:30).

California Needs to Increase Electricity Use in the Afternoons and Increase Generation in the Evenings



Safety Switch General Information

Global Specifications

System Voltage	600 VAC
Switch Type	Single Throw - Heavy Duty
Poles/Blades	3-Pole
Amperage	400
Protection	Fusible with Neutral
Enclosure Type	NEMA 12
Special Paint	ANSI-61 (Gray) Standard
Fuse Clips	"H" Fuse Clips
Switch Lugs	(2) 1/0-300 or (1) 1/0-750
Fungus Proof Treatment	None
Lock-On Provision	None
Trapped Key Interlock	None
Upper Viewing Window	Upper Viewing Window
Fuse Pullers	None
Control Pole	None
Ground Lugs	(2) 6-250
Stainless Mechanism	None
Mill Duty	None

Cover Controls

QUANTITY	DESCRIPTION
----------	-------------

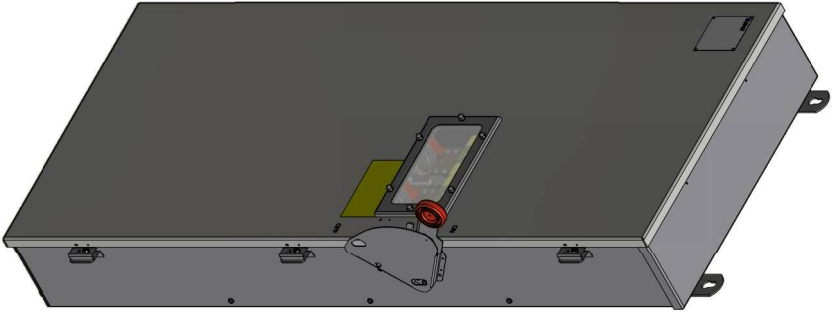
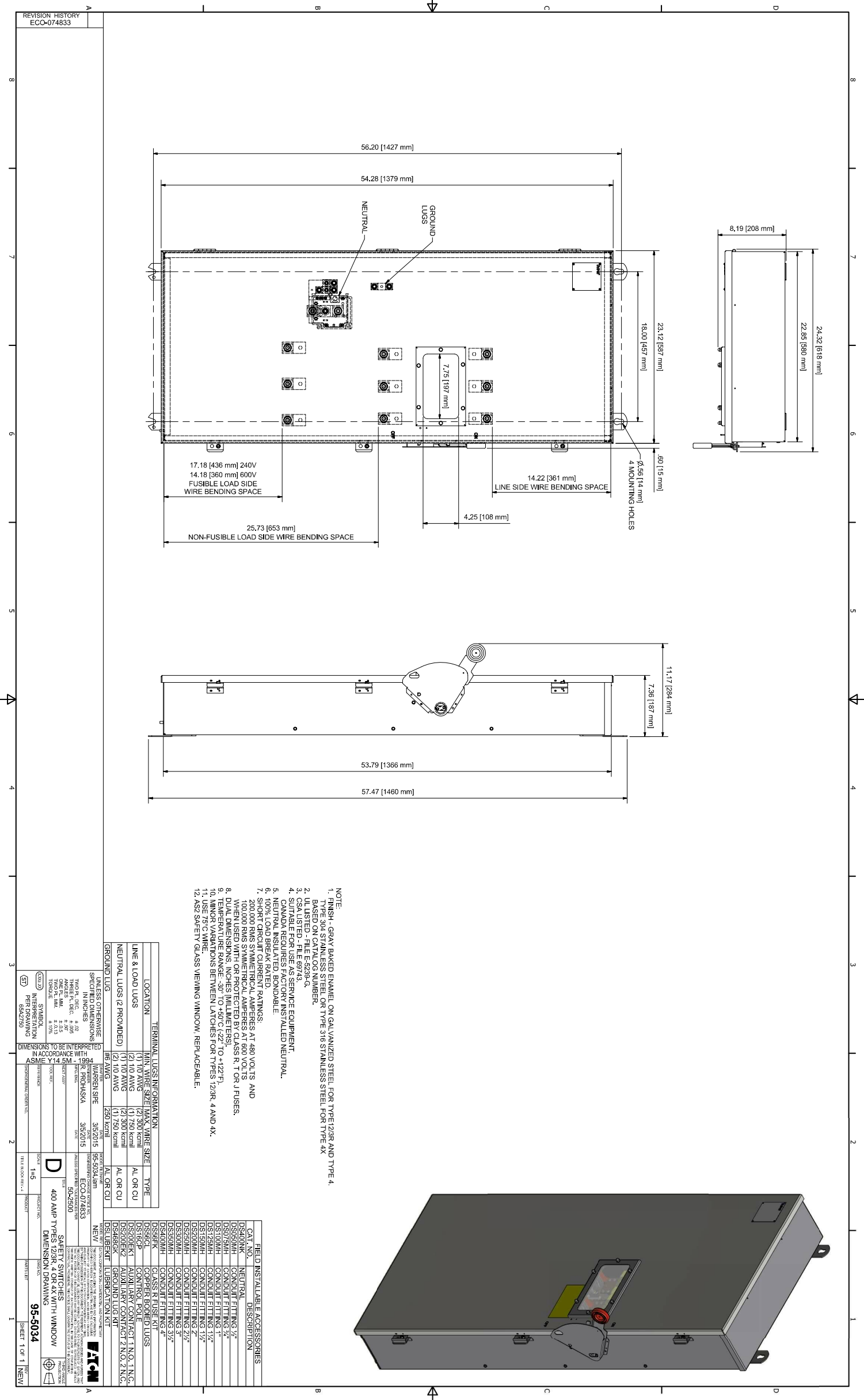
Nameplate

Safety Switch Catalog No.

DH365NDKW

The information on this document is created by Eaton Corporation. It is disclosed in confidence and it is only to be used for the purpose in which it is supplied.	PREPARED BY	DATE	Eaton		
	PATRICK DAVENPORT	5/4/2021			
	APPROVED BY	DATE	JOB NAME	50 kW Cogeneration Facility - Lancaster, Ca	
VERSION	TYPE	DRAWING TYPE			
1.0.0.2	Safety Switch General Information	Customer Appr.			
NEG-ALT Number	REVISION	DWG SIZE	G.O.	ITEM	SHEET
S69Z0504X1K1-0000	0	A			1 of 1

GO/NEG-Alt-Date: S69Z0504X1K1-0000-5/4/2021	Job Name: 50 kW Cogeneration Facility - Lancaster, Ca
Item Number: DH365NDKW	Designation: 400A Service Disconnect



- NOTE:**
- FINISH - GRAY BAKED ENAMEL ON GALVANIZED STEEL FOR TYPE 12/2R AND TYPE 4. TYPE 304 STAINLESS STEEL OR TYPE 316 STAINLESS STEEL FOR TYPE 4X BASED ON CATALOG NUMBER.
 - USE 75°C WIRE.
 - CSA LISTED - FILE 69743.
 - SUITABLE FOR USE AS SERVICE EQUIPMENT.
 - CANADA REQUIRES FACTORY INSTALLED NEUTRAL.
 - NEUTRAL INSULATED, BONDABLE.
 - SHORT CIRCUIT CURRENT RATINGS: 200,000 RMS SYMMETRICAL AMPERES AT 480 VOLTS AND 100,000 RMS SYMMETRICAL AMPERES AT 600 VOLTS WHEN USED WITH OR PROTECTED BY CLASS R, T OR J FUSES.
 - DUAL DIMENSIONS, INCHES WILL TAKE PRIORITY TO +122°F.
 - MINOR VARIATIONS BETWEEN LATCHES FOR TYPES 12/2R, 4 AND 4X.
 - USE 75°C WIRE.
 - AS2 SAFETY GLASS VIEWING WINDOW, REPLACEABLE.

LOCATION	MIN. WIRE SIZE	MAX. WIRE SIZE	TYPE
LINE & LOAD LUGS	(1) 7/0 AWG	(2) 3/0 kcmil	AL OR CU
NEUTRAL LUGS (2 PROVIDED)	(1) 7/0 AWG	(1) 750 kcmil	AL OR CU
GROUND LUGS	(2) 1/0 AWG	(1) 750 kcmil	AL OR CU

REVISION HISTORY ECO-074833	TERMINAL LUGS INFORMATION	FIELD INSTALLABLE ACCESSORIES
SPECIFIED DIMENSIONS	MIN. WIRE SIZE	NEUTRAL DESCRIPTION
UNLESS OTHERWISE SPECIFIED	MAX. WIRE SIZE	CONDUIT FITTING 1/2"
TERMINAL TYPE	TYPE	CONDUIT FITTING 1"
TERMINAL MATERIAL	AL OR CU	CONDUIT FITTING 1 1/2"
TERMINAL FINISH	AL OR CU	CONDUIT FITTING 2"
TERMINAL SIZE	AL OR CU	CONDUIT FITTING 2 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 3"
TERMINAL LENGTH	AL OR CU	CONDUIT FITTING 3 1/2"
TERMINAL WIDTH	AL OR CU	CONDUIT FITTING 4"
TERMINAL HEIGHT	AL OR CU	CONDUIT FITTING 4 1/2"
TERMINAL DEPTH	AL OR CU	CONDUIT FITTING 5"
TERMINAL AREA	AL OR CU	CONDUIT FITTING 5 1/2"
TERMINAL PERIMETER	AL OR CU	CONDUIT FITTING 6"
TERMINAL VOLUME	AL OR CU	CONDUIT FITTING 6 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 7"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 7 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 8"
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TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 35"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 35 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 36"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 36 1/2"
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TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 38 1/2"
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TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 39 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 40"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 40 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 41"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 41 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 42"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 42 1/2"
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TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 44"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 44 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 45"
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TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 46"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 46 1/2"
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TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 48"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 48 1/2"
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TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 50"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 50 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 51"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 51 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 52"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 52 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 53"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 53 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 54"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 54 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 55"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 55 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 56"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 56 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 57"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 57 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 58"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 58 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 59"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 59 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 60"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 60 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 61"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 61 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 62"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 62 1/2"
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TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 63 1/2"
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TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 65 1/2"
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TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 66 1/2"
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TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 67 1/2"
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TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 68 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 69"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 69 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 70"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 70 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 71"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 71 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 72"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 72 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 73"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 73 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 74"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 74 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 75"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 75 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 76"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 76 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 77"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 77 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 78"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 78 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 79"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 79 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 80"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 80 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 81"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 81 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 82"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 82 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 83"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 83 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 84"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 84 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 85"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 85 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 86"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 86 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 87"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 87 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 88"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 88 1/2"
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TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 90"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 90 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 91"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 91 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 92"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 92 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 93"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 93 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 94"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 94 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 95"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 95 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 96"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 96 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 97"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 97 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 98"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 98 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 99"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 99 1/2"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 100"
TERMINAL WEIGHT	AL OR CU	CONDUIT FITTING 100 1/2"

3.4.2 DC Wiring Installation for M80/60U_121 models

Please read the following instructions for DC wiring (M80/60U_121) :

These models are designed to be utilized with external combiner boxes and are not provisioned with internal DC combining capability.

- Specific size of DC conductors must be determined from NEC or other local codes.
- Ensure the correct conductor is connected to its associated terminal with ring lug (max width $\leq 25\text{mm}$).
- The range of conductor sizes accommodated by each DC terminal is 1/0~3/0AWG. Tighten each terminal with screw (M6) with a torque value of 52 lbf-in (5.9 N·m).
- For aluminum cable :
Min./max. Conductor cross-section 50 / 70 mm²
Tightening torque 52 lbf-in (5.9 N·m)
- For the 121 model, two mounting options for installing the DC connection are available, bottom (2" chassis access hole (KO)) or side entry (2½" chassis access hole (KO)). If side entry is required, remove the bus bar with torque value 159.3 lbf-in (18 N·m) as shown in **Figure 3-29**. After removing the bus bar, if the bottom entry is again required, install the bus bar back with torque value 159.3 lbf-in (18 N·m).

ATTENTION



- Please follow the following guideline for cabling if you use aluminum cables.
Guideline for aluminum conductor :
 - The oxide layer must be removed from the surface of the stripped aluminum conductor.
 - The stripped aluminum conductor is greased with Vaseline or contact grease with comparable properties after oxide layer removed.
 - Tightened with the maximum tightening torque for the modular terminal block.
 - The installation location must be kept free from humidity or aggressive atmospheres.

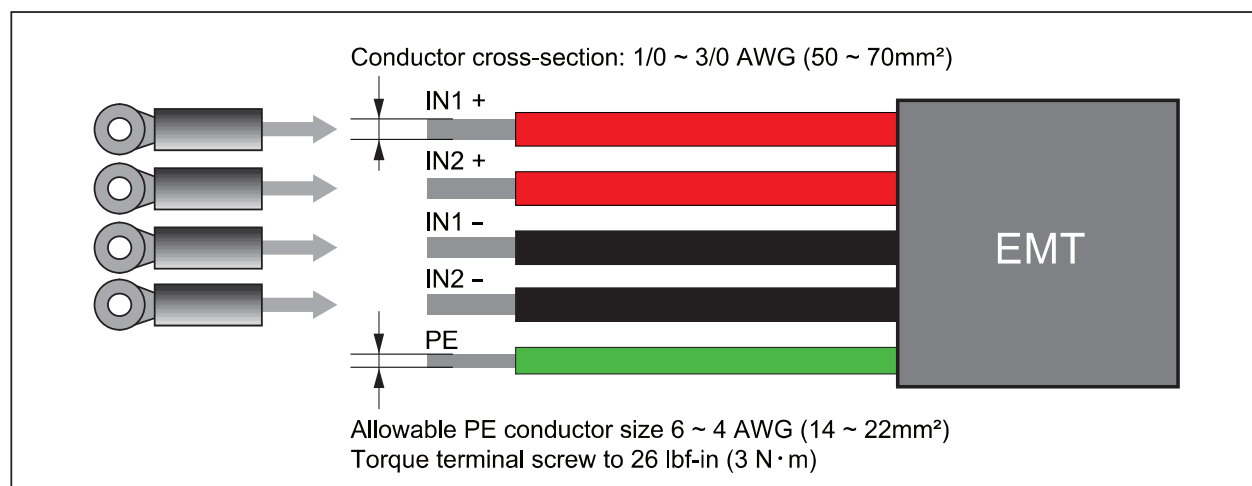
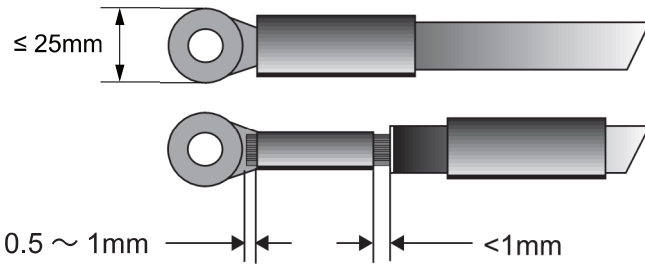


Figure 3-26: Size for DC conductors for M80/60U_121

- Please follow below instruction for wire crimping.



- To make sure good wire conduction, bare wire should not exceed the edge of crimping part of lug for more than 1mm.

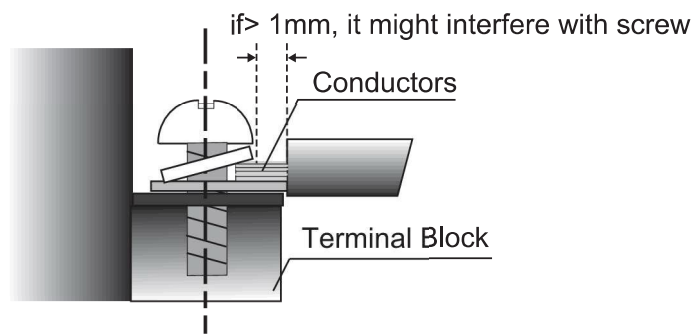


Figure 3-27: DC terminal lug for M80/60U_121

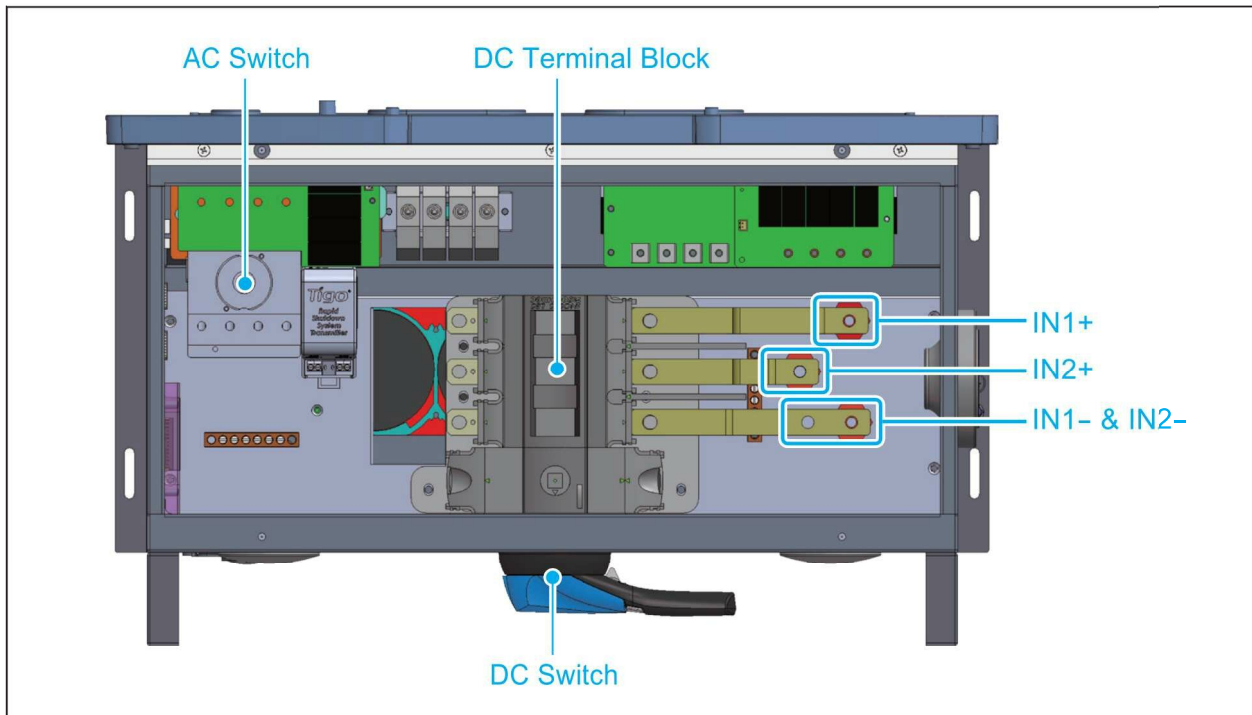


Figure 3-28: Wiring Box layout for M80/60U_121

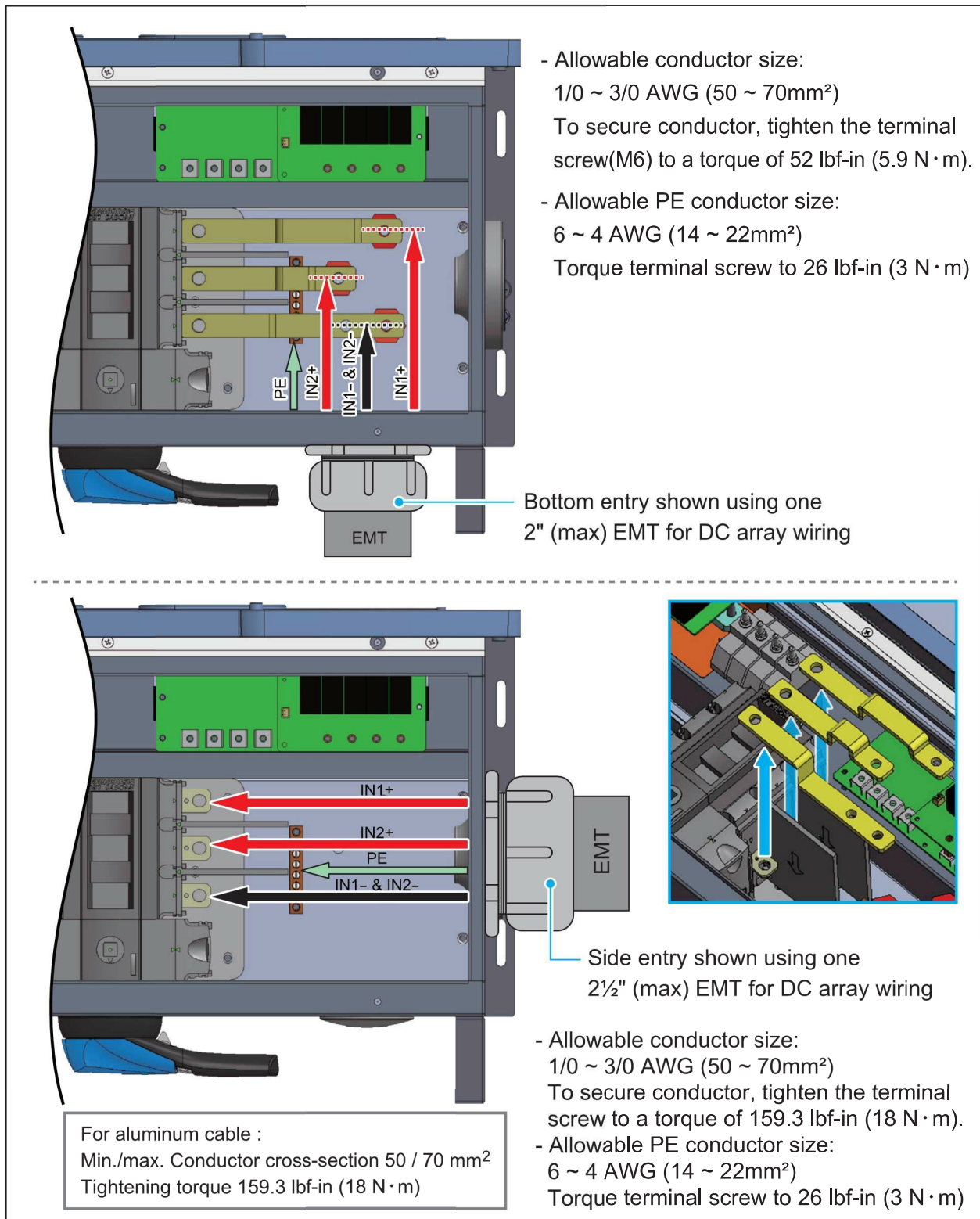


Figure 3-29: Location for DC terminals for M80/60U_121

ATTENTION



- Torque for removing/installing bus bar: 159.3 lbf-in (18 N·m)

WAPITI CONSULTING
ATTN MATT

QTY	DESCRIPTION	
	<p>NOTES:</p> <ul style="list-style-type: none"> - The grid converter can only be connected to the delta side of the transformer - Communication cables shall be routed via grounded metallic conduits for field wiring - UL Listed Surge Protection shall be installed in Enclosure (example Mersen STXR600D05) - Additional Relay shall be included in end installation for detection of open phase - Vacon Pre-charging circuit shall be used - Only Semiconductor fuses which are UL1741 files shall be used for module protection - UI Listed Branch circuit protection current rating shall be as per Vacon's UL1741 Files <p>FUSING TO BE INSTALLED TO MEET UL1741:</p> <ul style="list-style-type: none"> - (QTY-4) DC Fuse for AFE's - 170M6305 or 170M6496 (Bussmann) - (QTY-2) DC Fuse for INU - 170M6277 or 170M6198 (Bussmann) - (QTY-6) AC Fuse for AFE's - PC73UD13C450TF (Merson) <p>NOTE: +GAUG code will need to be added to both drives when ordering. This option is currently not available to quote while we await final certification review to be completed by UL, expected Q1 2021.</p>	
2	<p>DANFOSS VXSXLM 7DA-026160-000040436 NXA02616-A0T02SG- A1A2D7D2E9+GRDC+ARFIF106+LS60 NXA Active Front-End Unit Mains voltage: 525 # 690 Vac (640-1100 Vdc) Current: 261 Amp</p>	

	<p>Control Keypad: Alpha-numeric display Enclosure: IP00 EMC emission levels: IEC61800-3 for IT networks Brake Chopper: No Brake Electrical Modification: AFE module w/o LCL Mechanical Modification: Standard air cooled drive Card Modifications: FiberConnection+Varnished PCB Option Slot A A1,6DI,DO,2AI,1AO,+10Vr,+24V Option Slot B A2,2RO(NO/NC) Option Slot C D7,Line voltage meas. Option Slot D D2,SysBus(1fiber) + isol.CAN Option Slot E E9,2-port ethernet +GRDC: Grid Code Functionality +ARFIF106: Appl sw ARFIF106 NXP, NXI +LS60: Default Motor Frequency 60Hz</p>	
1	<p>DANFOSS VXSXLM 7DI-038560-000040509 NXI03856-A0T0ISG- A1A20000E9+APFIF09V172+LS60 NXI Inverter Unit Mechanical Modification: Standard air cooled drive Mains voltage: 525 # 690 Vac (640-1100 Vdc) Current: 385 Amp Control Keypad: Alpha-numeric display Enclosure: IP00 EMC emission levels: IEC61800-3 for IT networks Brake Chopper; No Brake Electrical Modification; INU, no charging circuit Card Modifications: FiberConnection+Varnished PCB Option Slot A A1,6DI,DO,2AI,1AO,+10Vr,+24V Option Slot B A2,2RO(NO/NC) Option Slot C No board Option Slot D No board Option Slot E E9,2-port ethernet +APFIF09V172: Appl sw FIFF09V172 NXS,NXP,NXI +LS60: Default Motor frequency 60HZ</p>	
2	<p>DANFOSS 41F1220 LCL-0325-6-B0R011T LCL-0325-6-B0R011T LCL Filter 325A 690V with</p>	
1	<p>DANFOSS 181B2082 Charging kit for AFE/FFE FI10 POW-CHARGING-AFE-FFE-FI10 Charging kit for AFE/FFE</p>	
3	<p>DANFOSS 181B2067 Door installation set PAN-DRA-02B</p>	

	Door installation set	

Single Meter Sockets - With Safety Socket Bypass

100 & 200 Amp



117TB (closed)



117TB (open)

Application

- Safety socket bypass (test block bypass) under separate cover
- Receive ANSI C12.10 watt-hour meters
- Surface mount

Construction

- Ring type
- NEMA Type 3R
- ANSI 61 gray painted finish
- Aluminum snap ring included



Standards

- UL 414 Listed
- ANSI C12.7
- EUSERC 304 & 305

Accessories

- 5th Jaw Kit - 50371
- Bussed Gutters - see page 50
- AW Hubs

Single Meter Sockets
With Safety Socket Bypass

Part/UPC Number	Catalog Number	Amp Rating	Jaws	Service Type	Access	Bypass	Connections		
							Line	Load	Neutral
78205147005	114 TB *	100	4	1Ø/3W	OH/UG	TB	#14 - 2/0	14 - 2/0	#14 - 1/0
78205147025	115 TB *	100	5	3Ø/3W	OH/UG	TB	#14 - 2/0	14 - 2/0	#14 - 1/0
78205147030	117 TB *	100	7	3Ø/4W	OH/UG	TB	#14 - 2/0	14 - 2/0	#14 - 1/0
78205159005	124 TB **	200	4	1Ø/3W	OH/UG	TB	#6 - 250 MCM	#6 - 250 MCM	1/0 - 250 MCM
78205159025	125 TB **	200	5	3Ø/3W	OH/UG	TB	#6 - 250 MCM	#6 - 250 MCM	1/0 - 250 MCM
78205159035	127 TB **	200	7	3Ø/4W	OH/UG	TB	#6 - 250 MCM	#6 - 250 MCM	1/0 - 250 MCM

Part/UPC Number	Catalog Number	Overall Dimensions			Top Provision	Knockout Layout
		Height	Width	Depth		
78205147005	114 TB *	24"	12"	4 ⁵ / ₈ "	AW Hub	Fig. 1
78205147025	115 TB *	24"	12"	4 ⁵ / ₈ "	AW Hub	Fig. 1
78205147030	117 TB *	24"	12"	4 ⁵ / ₈ "	AW Hub	Fig. 1
78205159005	124 TB **	30"	14"	6"	AW Hub	Fig. 2
78205159025	125 TB **	30"	14"	6"	AW Hub	Fig. 2
78205159035	127 TB **	30"	14"	6"	AW Hub	Fig. 2

* 100 Amp units compliant with EUSERC 304

** 200 Amp units compliant with EUSERC 305

Data subject to change without notice. Consult local utility for area acceptance. All dimensions are in inches.

Single Meter Sockets - With Safety Socket Bypass

100 & 200 Amp

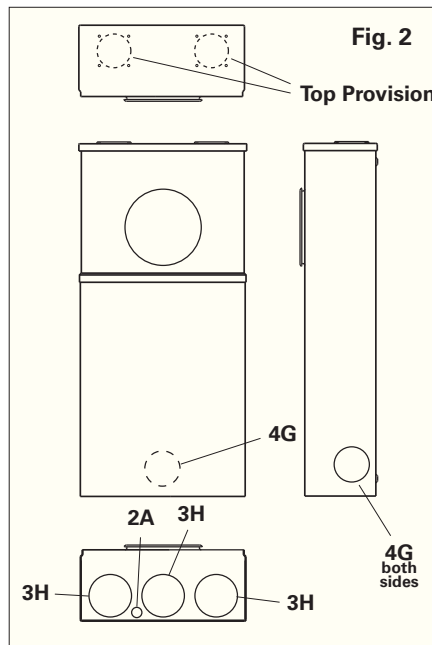
Style #	Suffixes
114 TB	F - Flush Mount
115 TB	MS20 - Ring Protector
117 TB	MS28 - Barriers on both sides of test block
124 TB	SS - Stainless Steel 304 *
125 TB	SS6 - Stainless Steel 316 *
127 TB	

Knockouts - Conduit Sizes

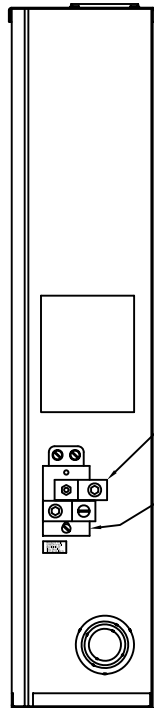
2A = 1/2" - 1/4"
 4F = 2" - 1 1/2" - 1 1/4" - 1"
 4G = 2 1/2" - 2" - 1 1/2" - 1 1/4"
 3H = 3" - 2 1/2" - 2"
 Top Provision = See Chart

* Knockouts and top provisions are not available in Stainless Steel (SS) finish

Knockout Layouts



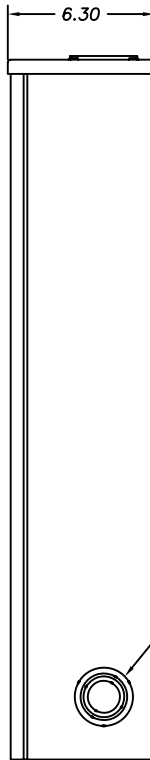
Single Meter Sockets
 With Safety Socket Bypass



1/0-250MCM LUGS
(2) POSITIONS

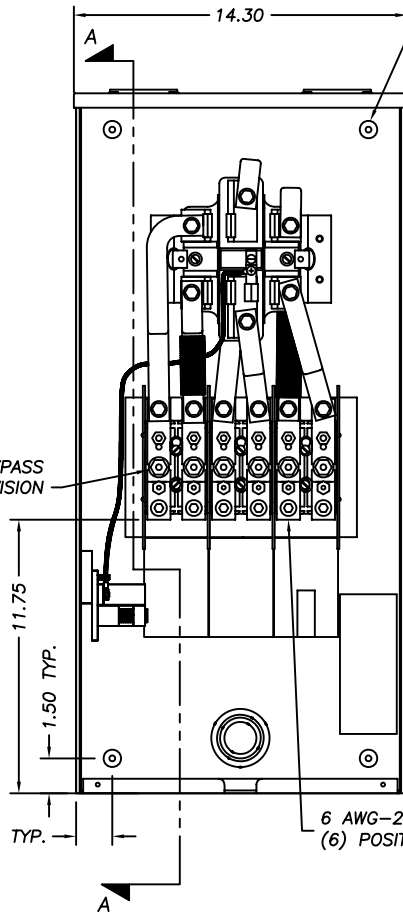
NEUTRAL BONDING
PROVISION
(SEE NOTE 4)

SECTION A-A



SIDE VIEW

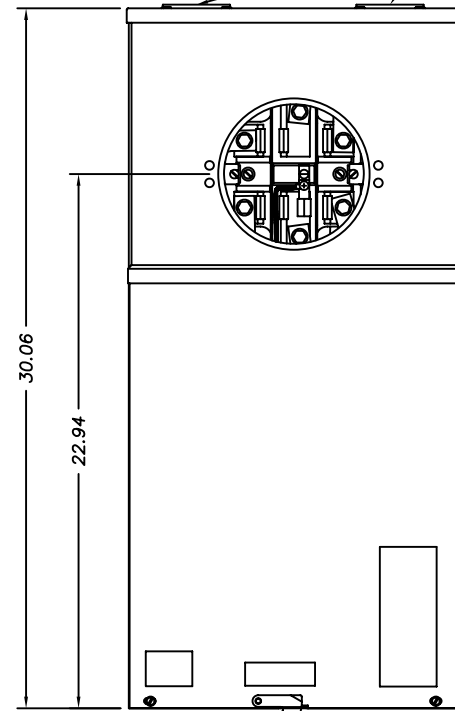
2 1/2", 2",
1 1/2", 1 1/4"
(3 PL)



FRONT VIEW
(W/O COVERS)

3/4" MOUNTING EMBOSS
W/ 1/4" THRU HOLE

AW HUB PROVISION



FRONT VIEW

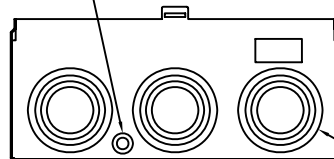
STAINLESS STEEL
UTILITY SEAL/PADLOCK
PROVISION

NOTES:

- RATING:
 - 200A CONT.
 - 600V MAX.
 - 3ø 4W
- CONSTRUCTION:
 - TYPE 3R CONSTRUCTION
 - OVERHEAD/UNDERGROUND FEED
 - ANSI 61 GRAY ACRYLIC ELECTROCOAT FINISH
- STANDARDS:
 - UL 414 LISTED
 - COMPLIES WITH ANSI C12.7
 - COMPLIES WITH EUSERC 305.
- REMOVE BONDING STRAP WHEN ISOLATING THE NEUTRAL CIRCUIT IS REQUIRED.


200 K AIC

1/2", 1/4" KO'S



BOTTOM VIEW
(W/O COVERS)

3", 2 1/2", 2"
(3 PL)

COOPER B-Line			
		HIGHLAND, ILLINOIS	
127 TB			
SUBMITTAL DRAWING			
DRAWN BY: DEBRAY		DATE: 12/30/03	SIZE: C
		ECO: -	REV: D
<small>THIS DRAWING AND/OR TECHNICAL INFORMATION CONTAINED HEREIN IS THE PROPERTY OF COOPER B-LINE, INC. (B-LINE), IS ISSUED IN CONFIDENCE FOR B-LINE ENGINEERING PURPOSES ONLY AND MAY NOT BE REPRODUCED OR USED FOR ANY PURPOSE WHATSOEVER WITHOUT THE EXPRESS WRITTEN PERMISSION OF B-LINE TO THE USER. THIS DRAWING AND/OR TECHNICAL INFORMATION IS THE PROPERTY OF B-LINE AND IS LOANED FOR MUTUAL ASSISTANCE. TO BE RETURNED WHEN ITS INTENDED PURPOSE HAS BEEN SERVED.</small>			

May 23, 2014

CLAUD SEAL
ANTELOPE VALLEY WATER STORAGE
1672 W. AVENUE J, SUITE 207
LANCASTER, CA 93534

HYDRAULIC TEST RESULTS: WELL G160SE
Location: 160TH ST W, ROSAMOND, CA 93560
Cust #: 1-242-9458 Serv. Acct. #: 041-3957-55
Meter: 345M-1174 Pump Ref. #: 2710

In accordance with your request, an energy efficiency test was performed on your turbine well pump on May 19, 2014. If you have any questions regarding the results which follow, please contact RICK KOCH at (805)654-7312.

Equipment

HP: 200.0

Pump: JOHNSTON	No: JX-1369
Motor: US	No: S03R284R113R-4

Results

Discharge Pressure, PSI	53.4
Standing Water Level, Feet	314.2
Drawdown, Feet	42.6
Discharge Head, Feet	123.4
Pumping Water Level, Feet	356.8
Total Head, Feet	480.2
Capacity, GPM	1,050
GPM per Foot Drawdown	24.6
Acre Feet Pumped in 24 Hours	4.641
kW Input to Motor	156.0
HP Input to Motor	209.2
Motor Load (%)	97.8
Measured Speed of Pump, RPM	1,792
Customer Meter, GPM	999
kWh per Acre Foot	807
Overall Plant Efficiency (%)	60.9

The cost analysis is based on a 4 month billing history.

RUSS JOHNSON
Manager
Hydraulic Services

May 23, 2014

CLAUD SEAL
ANTELOPE VALLEY WATER STORAGE
1672 W. AVENUE J, SUITE 207
LANCASTER, CA 93534

PUMPING COST ANALYSIS: WELL G160SE
Location: 160TH ST W, ROSAMOND, CA 93560
Cust #: 1-242-9458 Serv. Acct. #: 041-3957-55
Meter: 345M-1174 Pump Ref. #: 2710

The following energy efficiency analysis is presented as an aid to your cost accounting. This is an estimate based on the conditions present during the Edison pump test performed on May 19, 2014, billing history for the past 12 months, and your current rate of TOU-PA-2-B.

Assuming that water requirements will be the same as for the past year, and all operating conditions (annual hours of operation, head above, and water pumping level) will remain the same as they were at the time of the pump test, it is estimated that:

1. Overall plant efficiency can be improved from 60.9% to 70.0%.
2. This can save you up to 4,727 kWh and \$734.64 annually.
3. These kWh savings translate to a 2.1-ton decrease in CO₂ emissions.

	<u>Existing</u>	<u>Plant Efficiency Improved</u>	<u>Savings</u>
Total kWh	36,216	31,489	4,727
kW Input	156.0	135.6	20.4
kWh per Acre Foot	807	702	105
Acre Feet per Year	44.9		
Average Cost per kWh	\$0.16		
Average Cost per Acre Foot	\$125.41	\$109.04	\$16.37
Overall Plant Efficiency (%)	60.9	70.0	
Total Annual Cost	\$5,629.05	\$4,894.41	\$734.64

It is sincerely hoped that this information will prove helpful to you, and that your concerns over maintaining optimum pumping efficiency will be continued. If you have any questions regarding this report, please contact RICK KOCH at (805)654-7312.

RUSS JOHNSON
Manager
Hydraulic Services



**Save Energy,
Save Money. . .
Your test results show that you can!**

May 23, 2014

CLAUD SEAL
ANTELOPE VALLEY WATER STORAGE
1672 W. AVENUE J, SUITE 207
LANCASTER, CA 93534

PUMPING COST ANALYSIS

WELL G160SE
Location: 160TH ST W, ROSAMOND, CA 93560
Cust #: 1-242-9458 Serv. Acct. #: 041-3957-55
Meter: 345M-1174 Pump Ref. #: 2710

Dear SCE Customer:

Helping California businesses save energy and money is a major goal at SCE. As you know, our Technical Specialist performed a free energy efficiency test on one or more pumps at your facility on May 19, 2014. We thank you for the opportunity to provide this service, and appreciate your interest in the performance of your pumps.

The results of the testing, shown in the table below, indicate that the pump listed above has the potential for improved Overall Plant Efficiency (OPE), lower energy costs, and a cash incentive.

	Projected Incentive, Energy, and Cost Savings			
	<u>Existing</u>	<u>Improved</u>	<u>Savings</u>	<u>Cash Incentive</u>
Total kWh	36,216	31,489	4,727	\$378.12
kW Input	156.0	135.6	20.4	
kW on-peak activity factor *			0.0	\$0.00
Acre Feet per Year	44.9			
kWh per Acre Foot	807	702	105	
Average Cost per Acre Foot	\$125.41	\$109.04	\$16.37	
Overall Plant Efficiency (%)	60.9	70.0		
Annual Total	\$5,629.05	\$4,894.41	\$734.64	\$378.12

(*The kW on-peak activity factor represents how the kW impacts the SCE system during on-peak periods as determined by SCE's agricultural and water pumping customers' average load profiles. By improving efficiency, your expected kW savings is 20.4 kW, and the savings used for incentive calculations is 0% of 20.4, or 0.0 kW.)

Actual kW savings may vary at time of application validation.

Case studies have shown that repairing, retrofitting, or replacing inefficient pumps can save energy and money, and may even help you avoid serious operational problems. For your business, this could mean the following:

- **Improved Plant Efficiency:** Your OPE can be improved from 60.9% to 70.0%.
- **Lower Energy Costs:** Based on the test data, your past energy usage, and your current rate of TOU-PA-2-B, we estimate that you may save up to 4,727 kWh annually (which translates to a 2.1-ton decrease in CO₂ emissions). This may result in energy cost savings of \$734.64.
- **Cash Incentive:** Through the retrofit and installation of more energy-efficient equipment, you have the potential to receive an incentive of \$0.08 per kWh and \$100 per on-peak activity factored kW reduced, courtesy of SCE's Customized Efficiency Program. Based on your estimated kWh and kW, you would be eligible for a Potential Cash Incentive of \$378.12, capped at 50% of your project cost. (See contract for details.)

If you are interested in an incentive for this pump, please contact **OMAR FARIS** at **(559)685-3243** to complete a project application. All applicants must receive a **written approval authorization before** implementing any project; failure to comply will result in forfeiture of incentive funding.

We encourage you to review your results and take advantage of SCE's energy efficiency expertise and incentives. Visit www.sce.com/rebatesandsavings, or give us a call and let us know how we can be of further service to you.

Sincerely,

Southern California Edison

Template for Declaration of Intention

**Antelope Valley Water Storage LLC
1672 W. J Street, Suite 207
Lancaster, CA 93535
Phone: 323-860-4829, Fax: 661-945-4554
email: mbeuhler@wswaterbank.com**

Date: **February 9, 2022**

Secretary
Federal Energy Regulatory Commission
888 First Street, NE. (PJ-12.2)
Washington, D.C. 20426

Re: Antelope Valley Water Storage APH

Declaration of Intention **Antelope Valley Water Storage APH**

Dear Sir:

Enclosed please find an original and eight copies of the Declaration of Intention for the **Antelope Valley Water Storage APH** for your consideration.

Thank you for your consideration in this matter.

Sincerely,



Lon W House, Ph.D.

Antelope Valley Water Storage

Declaration of Intention
for the
Antelope Valley Water Storage APH

Submitted to

Federal Energy Regulatory Commission

February 9, 2022

Declaration of Intention

The location of the project:

State: **California**

Town: **Rosamond**

Street: **Gaskell & 160th**

County: **Kern**

Stream: **NA – using groundwater**

River Basin Name: **Antelope Valley Groundwater Basin (there is no river)**

Township, Range, Section, and Meridian: **THE NORTHWEST QUARTER OF SECTION 31, TOWNSHIP 9 NORTH, RANGE 14 WEST, MOUNT SAN BERNARDINO BASE AND MERIDIAN. Lat 34.83395, Long -118.404904.**

The exact name, business address, telephone number, FAX number, and E-Mail address of the applicant are:

Antelope Valley Water Storage LLC

1672 W. J Street, Suite 207

Lancaster, CA 93535

Phone: 323-860-4829, Fax: 661-945-4554, email: mbeuhler@wswaterbank.com

The exact name, business address, telephone number, FAX number, and E-Mail address of the person authorized to act as agent for the applicant is:

Lon House, Water and Energy Consulting

10645 N Oracle, Ste 121-216

Oro Valley, AZ 85704

Phone: 530.409.9702, Fax: 5202972643, email: lonwhouse@gmail.com

The exact name, business address, telephone number, FAX number, and E-Mail address of the local electric utility company is:

Southern California Edison Company, 2233 Walnut Grove Ave, Rosemead, CA 91770, phone: 800-655-4555, fax: 626-302-6396, email: info@sce.com

-2-

PROJECT DESCRIPTION

A brief description of the project, including intakes, penstocks, primary transmission lines (to the point of interconnection), age of facilities, including generators, and the project's purposes, including such data as maximum height of the dams, a storage capacity curve of the reservoir or reservoirs showing the maximum average, and minimum operating pool levels, proposed mode of operation (peak or run-of-river) and initial and ultimate installed capacity of the project, the rated kilowatt and head on the turbines, and a curve of turbine discharge versus output at average and minimum operating heads.

Aquifer Pumped Hydro (APH) is a form of pumped storage technology that uses the groundwater aquifer as the lower reservoir and a reservoir or storage facility on the ground surface as the upper reservoir. The individual Aquifer Pumped Hydro unit consists of a reversible pump/turbine, a well, and related equipment. Electric well pumps, when supplied with electricity, pump water. When operated in reverse, water forced through the well shaft and impellers, the well motor produces electricity. Motors on existing wells can be repurposed to act as generators. It requires a pressure regulating valve at the bottom of the well, a variable frequency drive (VFD), a switch for the grid, a regeneration module, and some electric control modifications. The pump/turbine generates electricity from water flowing down the well. It stores electricity at other times by pumping water up the well from the aquifer to the surface using electric power [page 10].

A typical well at WSWB includes a 200 HP 480 Vac (Volts, alternating current) 3-wire electric pump motor, standard centrifugal vertical-turbine pump, motor control panels, electrical panels, circuit breakers and transformer unit. The vertical-turbine pump is operated in the forward direction using electric power to pump water and can be operated in the reverse direction, "Pump as Turbine" to generate electric power. To enable the pump to operate in the reverse direction to generate electric power, required modifications to the existing system include:

- 1. Pump shaft modification to enable the shaft to turn in the reverse direction.**
- 2. Addition of pressure control valve on pump shaft and electronic valve control unit.**
- 3. Addition of Power Electronics Controller to excite the motor-generator and rectify the output to enable motor to operate efficiently as a generator.**
- 4. Addition of a grid-tie inverter/rectifier.**
- 5. Addition of System Control and Monitoring for overall control and protection of all the elements of the electrical system, with primary job to route power to and from the energy storage system, local power sources and the loads.**

6. Modification of electric system to interface with energy sources, user loads, and utility grid.

See page 9 for additional details.

Equipment consists of an existing well pumping water out of the ground in one direction and generating electricity in the other direction. The well motor is an Emerson Motor Company BF84A, rated at 200 hp (150 kW) operating at 480V. The well depth is 600 ft, depth to groundwater is 314 ft. The well casing is 14 in. and the well pumps 1050 gpm.



Example Irrigation Well Used for APH

To the well will be added a variable frequency drive, a water control valve at the bottom of the well, and electronics to connect to the grid.

The surface storage reservoir will be three flexible tanks (bladders) connected to the well by 12 in piping.

210,000 gallon Flexible Tank Specifications

Capacity	210,000 gallons 794,936
Dimensions	75' x 73' x 6' 22.8 m x 22.25 m x 1.8 m
Fittings	Standard 6" Fitting
Military Testing & Specifications	Furnished in Accordance with US Military Specification, MIL-PRF-32233 for Fuel Storage
Product Flyer (PDF)	Flexible Fuel Tank Product Flyer
Installation Instructions (PDF)	Flexible Tank Installation

-4-



Military Potable Water Bladder - 210000 Gallons



For Questions or
To Place an Order
CALL 1-800-474-7294

SKU: IPI-MSWB-210000

GALLON CAPCAITY: 210000

CONNECTIONS:
2 x 6" Male Camlocks with 2 x Valve, 2 x Elbow 2 x 12' Hoses, 1 x Vent , 1 x 2" Bottom Drain with 1 x Elbow, 1 x Valve

BLADDER TYPE: M Is this for Irrigation, water shortages, fires, or is this for a military application?

CHAT: 

In the generation mode 1000 gpm will be pushed through the well motor and back down into the aquifer. 50 kW generation is expected. The surface storage will allow 10 hours of generation at this level.

PROJECT HISTORY:

A description of the project's history, if applicable.

Antelope Valley Water Storage is a groundwater storage bank outside of Lancaster, California. The of the project is to recharge the aquifer and store imported surface water beneath properties in the west end of the Antelope Valley. There are currently seven existing wells in this area that are being investigated for APH.

Antelope Valley Water Storage has received several research grants from the California Energy Commission (CEC). EPC15-049 investigated the feasibility and economics of APH at Antelope Valley Water Storage. EPC16-029 investigated multiple usage of a groundwater storage bank. This project is currently demonstrating long duration energy storage using APH under CEC contracts EPC19-058 and EPC 20-008.

JURISDICTIONAL ANALYSIS

1. Navigability of the stream, including current and historical uses.

NA, using groundwater

2. Land Status (private, State owned, Federally owned)

All land privately owned

3. State whether the project will use surplus water or waterpower from a Government Dam:

On- site groundwater will be used, no water from Government dams.

4. Affects Interstate Commerce:

_None, only local groundwater used.

5. State which power company the project will be connected to and include dates of construction or modifications to the project (if existing), any increase in generation and dates of such increases, if applicable.

Southern California Edison Company is the host electric utility. Construction of the added facilities will commence after approval of the interconnection application NST-206659. Power will be net metered under this agreement.

-6-

PROFILE OF THE RIVER DURATION CURVE AND HYDROGRAPH

Show a profile of the river within the vicinity of the project showing the location of the proposed project and any existing improvements in the river.

NA groundwater is being used.

Show a flow duration curve and hydrograph for the natural and proposed regulated flows at the dam site. Furnish references to the published stream flow records used and submit copies of any unpublished records used in preparation of these curves.

NA groundwater is being used.

Include a definite statement of the proposed method of utilizing storage or pondage seasonally, weekly, and daily, during periods of low and normal flows after the plant is in operation and the system load has ground to the extent that the capacity of the plant is required to meet the load. For example, furnish:

(1) Hydrographs covering a 10-day low water period showing the natural flow of the stream and the effect thereon caused by operations of the proposed power plant; **NA**

(2) Similar hydrographs covering a 10-day period during which the discharge of the stream approximates average recorded yearly flow, **NA**

(3) Similar hydrographs covering a low water year using average monthly flows; **NA**

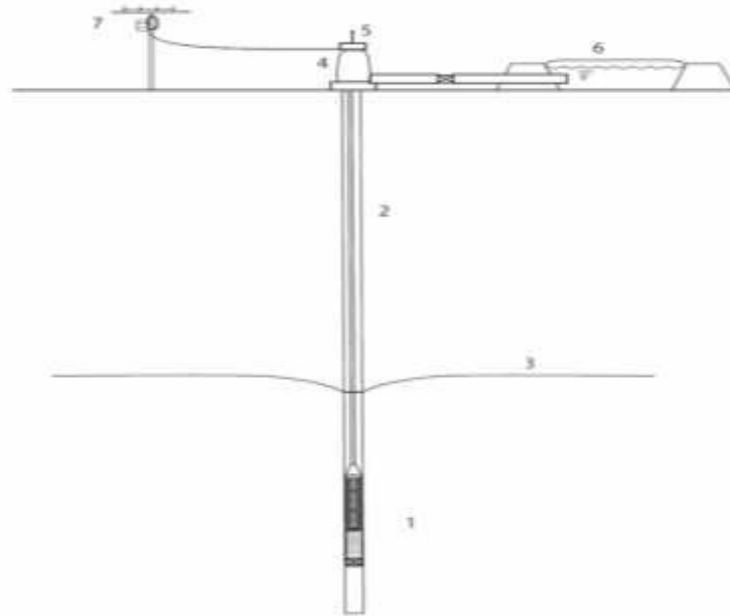
(4) A system load curve, both daily and monthly, and the position on the load curve that the proposed project would have occupied had it been in operation; **NA** and

(5) A proposed annual rule of operation for the storage reservoir or reservoirs.

Water will be pumped into storage during periods of high renewable electricity production in California (typically afternoons), and generation will occur during periods of low system generation (typically early evening hours).

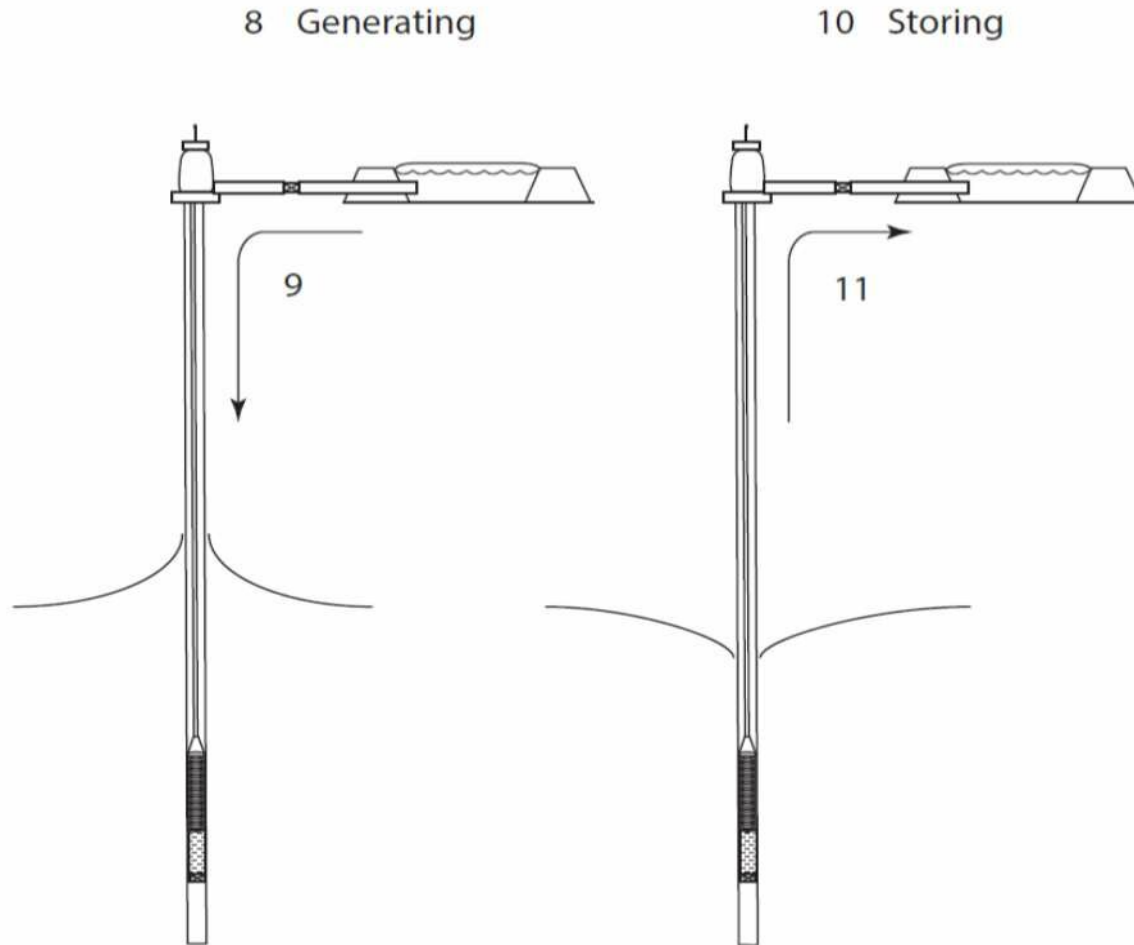


-9-



The figure shows an individual unit of the APH modular pumped hydroelectric system. It consists of a reversible pump/turbine unit at the bottom of a well shaft with a control valve [1], the well itself [2], the natural water table of the aquifer which serves as the lower reservoir [3], the electric variable frequency motor/generator for the module [4], the remote control and command of the valves and motor/generator of the module [5], the surface reservoir, combined inlet/outlet pipe and flow control valve which constitutes the upper reservoir [6], and the alternating current transformers that connect the module to the electric grid [7].

-10-



These figures show the operation of an individual unit of the APH modular pumped hydroelectric system. In Generating mode, the water from the surface is injected back through the well pump [9], spinning it backwards and producing electricity. In the Storage mode the well pumps water out of the aquifer [11] and into a surface storage facility.

Appendix G. Load Justification

Start Read Date	End Read Date	Total kWh Usage	Bill Cost (\$)	Daily Avg kWh (kWh/day)	Max KW	Annual	Gaskell & 160th SE		
12/18/13	12/21/13	0	\$43.09	0.00	0	560,395	Year	kWh used	
12/21/13	1/22/14	0	\$41.46	0.00	0		2014	560,395	
1/22/14	2/21/14	11,227	\$2,303.00	374.23	165		2015	639,614	Ave kWh
2/21/14	3/25/14	24,994	\$3,242.41	781.06	167		2016	536,818	465,886
3/25/14	4/23/14	68,175	\$6,366.66	2350.86	167		2017	491,456	
4/23/14	5/22/14	66,764	\$6,728.34	2302.20	164		2018	561,261	
5/22/14	6/23/14	76,797	\$10,748.65	2399.90	167		2019	471,660	
6/23/14	7/23/14	71,601	\$11,416.72	2386.70	168		2020	394,683	
7/23/14	8/21/14	77,112	\$11,460.51	2659.03	168				
8/21/14	9/22/14	77,069	\$11,475.88	2408.41	166				
9/22/14	10/22/14	27,982	\$5,080.84	932.73	165				
10/22/14	11/20/14	55,847	\$6,382.08	1925.76	168				
11/20/14	12/22/14	2,827	\$1,667.63	88.34	164		639,614		
12/22/14	1/22/15	0	\$41.19	0.00	0				
1/22/15	2/23/15	13,465	\$2,604.27	420.78	168				
2/23/15	3/24/15	78,292	\$8,109.10	2699.72	169				
3/24/15	4/24/15	#####	\$9,856.93	3281.45	162				
4/24/15	5/22/15	64,729	\$6,783.94	2311.75	161				
5/22/15	6/23/15	75,564	\$9,582.97	2361.38	159				
6/23/15	7/23/15	80,824	\$11,916.56	2694.13	159				
7/23/15	8/21/15	70,290	\$11,598.73	2423.79	160				
8/21/15	9/23/15	71,717	\$10,798.78	2173.24	160				
9/23/15	10/22/15	53,618	\$6,667.26	1848.90	159				
10/22/15	11/23/15	29,151	\$3,853.50	910.97	159				
11/23/15	12/23/15	239	\$1,470.99	7.97	158	536,818			
12/23/15	1/25/16	0	\$45.01	0	0				
1/25/16	2/23/16	2,589	\$1,889.59	89.28	161				
2/23/16	3/23/16	34,370	\$3,937.23	1185.17	160				
3/23/16	4/22/16	20,420	\$3,059.19	680.67	161				
4/22/16	5/23/16	80,866	\$7,079.34	2608.58	166				
5/23/16	6/22/16	64,022	\$8,209.00	2134.07	160				
6/22/16	7/22/16	86,234	\$10,584.03	2874.47	159				
7/22/16	8/22/16	85,058	\$10,615.57	2743.81	160				
8/22/16	9/22/16	80,763	\$10,176.85	2605.26	160				
9/22/16	10/21/16	46,510	\$5,840.70	1603.79	160				
10/21/16	11/22/16	35,986	\$3,893.40	1124.56	159				
11/22/16	12/22/16	0	\$42.25	0.00	0		491,456		
12/22/16	1/23/17	0	\$41.82	0.00	0				
1/23/17	2/22/17	0	\$41.63	0.00	0				
2/22/17	3/23/17	20,565	\$3,150.48	709.14	158				
3/23/17	4/25/17	22,456	\$3,377.72	680.48	161				

4/25/17	5/23/17	64,964	\$6,096.35	2320.14	161
5/23/17	6/22/17	68,803	\$8,649.48	2293.43	163
6/22/17	7/24/17	82,492	\$11,294.34	2577.88	159
7/24/17	8/22/17	76,118	\$10,570.11	2624.76	159
8/22/17	9/21/17	67,985	\$9,484.69	2266.17	159
9/21/17	10/20/17	70,437	\$8,165.34	2428.86	160
10/20/17	11/20/17	17,636	\$2,956.57	568.90	160
11/20/17	12/20/17	0	\$41.63	0.00	0
12/20/17	1/22/18	0	\$42.60	0.00	0
1/22/18	2/21/18	9,552	\$2,501.97	318.40	161
2/21/18	3/22/18	30,291	\$3,868.50	1044.52	160
3/22/18	4/23/18	58,443	\$5,792.78	1826.34	162
4/23/18	5/22/18	77,330	\$6,996.04	2666.55	160
5/22/18	6/21/18	60,254	\$8,769.74	2008.47	160
6/21/18	7/23/18	86,722	\$12,002.63	2710.06	161
7/23/18	8/21/18	82,805	\$12,025.68	2855.34	162
8/21/18	9/20/18	52,054	\$7,372.99	1735.13	161
9/20/18	10/19/18	57,212	\$6,837.80	1972.83	161
10/19/18	11/19/18	46,598	\$4,964.73	1503.16	162
11/19/18	12/20/18	0	\$43.15	0.00	0
12/20/18	1/22/19	0	\$43.15	0.00	0
1/22/19	2/21/19	0	\$43.15	0.00	0
2/21/19	3/22/19	13,898	\$2,525.79	479.24	161
3/22/19	4/23/19	48,380	\$5,337.04	1511.88	163
4/23/19	5/22/19	48,931	\$5,381.96	1687.28	162
5/22/19	6/21/19	60,541	\$7,982.40	2018.03	163
6/21/19	7/23/19	91,643	\$11,658.17	2863.84	162
7/23/19	8/21/19	71,589	\$9,650.08	2468.59	162
8/21/19	9/23/19	74,163	\$9,907.38	2247.36	162
9/23/19	10/22/19	52,085	\$6,407.49	1796.03	163
10/22/19	11/21/19	10,430	\$2,465.30	347.67	163
11/21/19	12/21/19	0	\$38.15	0.00	0
12/21/19	1/23/20	0	\$40.32	0.00	0
1/23/20	2/21/20	0	\$41.40	0.00	0
2/21/20	3/23/20	15,531	\$2,923.03	501.00	161
3/23/20	4/21/20	0	\$42.96	0.00	0
4/21/20	5/21/20	43,566	\$5,560.93	1452.20	162
5/21/20	6/22/20	33,842	\$6,126.20	1057.56	163
6/22/20	7/23/20	77,110	\$11,365.70	2487.42	164
7/23/20	8/21/20	85,563	\$12,096.03	2950.45	163
8/21/20	9/22/20	87,402	\$12,311.24	2731.31	163
9/22/20	10/22/20	51,669	\$6,499.92	1722.30	163
10/22/20	11/23/20	0	\$51.09	0.00	0
11/23/20	12/22/20	0	\$51.09	0.00	0
12/22/20	1/24/21	0	\$51.09	0.00	0
1/24/21	2/24/21	0	\$54.60	0.00	0
2/24/21	3/24/21	31,563	\$5,164.18	1127.25	161

561,261

471,660

394,683

NST- Gaskell & 160 SE

Generation Size Determination

There are two ways to determine the level of generation when water wells are run backwards to produce electricity.

One way is based on the literature (the "Pyne" book). The other is based on actual flow and depth to water information.

"Aquifer Storage and Recovery" by R. David G. Pyne is the standard reference for ASR wells. It states that "30% of the well production brake horsepower" can be expected from electrical generation phase. Using this valuation the expected generation for the Gaskell & 152 well would be 56 kW:

Irrigation Well	Well Name Plate HP	Generation (kW) [30% of well brake horsepower]
Gaskell & 160th (14" casing)	200	60

The other approach is to use the traditional hydropower equation:

Theoretical Generation kW = (Head (feet) * Flow (cfs))/11.81 conversion factor

Actual Generation kW = Theoretical kW * efficiency.

Assumptions:

Injection flow rate - 1200 gallons per minute (2.674cfs). Injection flows are about 120% of extraction flows (no discharge head).

Head = 314 ft to water table (600 ft total well depth).

Calculation: (314 ft * 2.674 cfs/11.81) = 71 kW theoretical @ 65% efficiency = 46 kW actual.

Theoretical kW	Actual KW @ 65% efficiency
71	46

Since this is a California Energy Commission Research study (CEC Project EPC-19-058) we do not know what the actual generation level will be. That is one of things being investigated. For the Interconnection Application we are assuming a median level of 50 kW of generation.

Generation Determination

When we have water at the surface ready to be injected through the well APH generation is possible.

In 2020 this well ran about 2350 hours during the year, consuming 394,683 kWh.

This is a CEC research grant to demonstrate APH. We are installing 6.9kWdc of solar (about 13,300 kWh generation annually). This will be used to run the electronics, valves, and controls for the APH generator.

APH	APH
Generation Hou	Generation kWh
75	3,750

Multiple Point Test Summary



ANTELOPE VLY WATER STORAGE LLC

Pumping Plant Name	WELL G160SE	KINGBIRD 170 WELL	WELL 160 KINGBIRD	WELL AVE A 165	WELL G152	
Test Date	10/7/21	11/8/21	11/8/21	11/8/21	11/9/21	
Pump Tester Name	Frederick J Koch	Frederick J Koch	Frederick J Koch	Frederick J Koch	Frederick J Koch	
Contract ID	8002087301	8002085989	8001939331	8001323688	8002925397	
Meter Number	345M-001174	259000-072396	345M-007094	259000-071242	259000-062195	
Reference Number	2710	2870	2914	25880	25881	
Rate	TP2E49	TP2E49	TP2E49	TP2E49	TP2D49	
Average \$ Cost/kWh	\$0.14476	\$0.18000	\$0.18000	\$0.18000	\$0.18000	
Pump Type	Turbine Well	Turbine Well	Turbine Well	Turbine Well	Turbine Well	
Motor HP	200	200	150	200	250	
Motor Mfg.	US	US	US	GE	US	
Pump Mfg.	JOHNSTON	PEERLESS		L & B	PEERLESS	
Test Points / Frequency						
Discharge Pressure, PSI	46.1 64.3 88.9	123.0	30.8 50.8	15.6	38.1 89.5	
Suction Pressure, PSI						
Drawdown, Ft.	60.4 55.4 43.4	11.0	43.2 42.0	21.0	124.8 111.4	
Pumping Level, Ft.	336.0 331.0 319.0	252.4	299.2 298.0	249.7	420.4 407.0	
Standing Level, Ft.	275.6 275.6 275.6	241.4	256.0 256.0	228.7	295.6 295.6	
Discharge Head Ft.	106.5 148.5 205.4	284.1	71.1 117.3	36.0	88.0 206.7	
Suction Head Ft.	336.0 331.0 319.0	252.4	299.2 298.0	249.7	420.4 407.0	
Total Head Ft.	442.5 479.5 524.4	536.5	370.3 415.3	285.7	508.4 613.7	
Customer GPM	1,216		851		910	
Capacity GPM	1,131 976	762 880	773 725	1,682	919 819	
GPM/Ft. Drawdown, Ft.	18.7 17.6 17.6	80.0	17.9 17.3	80.1	7.4 7.4	
Acre Ft./24 Hour	4.999 4.314	3.368 3.890	3.417 3.205	7.434	4.062 3.620	
kW Input	159.1 156.0 148.0	151.4	112.2 112.5	182.9	134.3 138.8	
HP Input	213.4 209.2 198.5	203.0	150.5 150.9	245.3	180.1 186.1	
Pump Speed, RPM	1,783	1,785	1,782	1,779	1,790	
Motor Load %	99.7 97.8 92.8	94.9	93.3 93.5	114.7	69.0 71.3	
kWh/Acre Ft.	764 868 1,055	934	788 843	591	794 920	
Overall Plant Eff., %	59.23 56.50 50.84	58.73	48.05 50.41	49.48	65.51 68.20	
Improved Plant Eff., %	70	69	70	69	75	
Improved kWh/Acre Ft.	646	795	541	424	693	
Potential Savings, \$	\$11,856	\$0	\$1	\$1	\$0	

Note: For more detailed information pertaining to pump test results, please refer to Pump Test Results and Cost Analysis Letters.

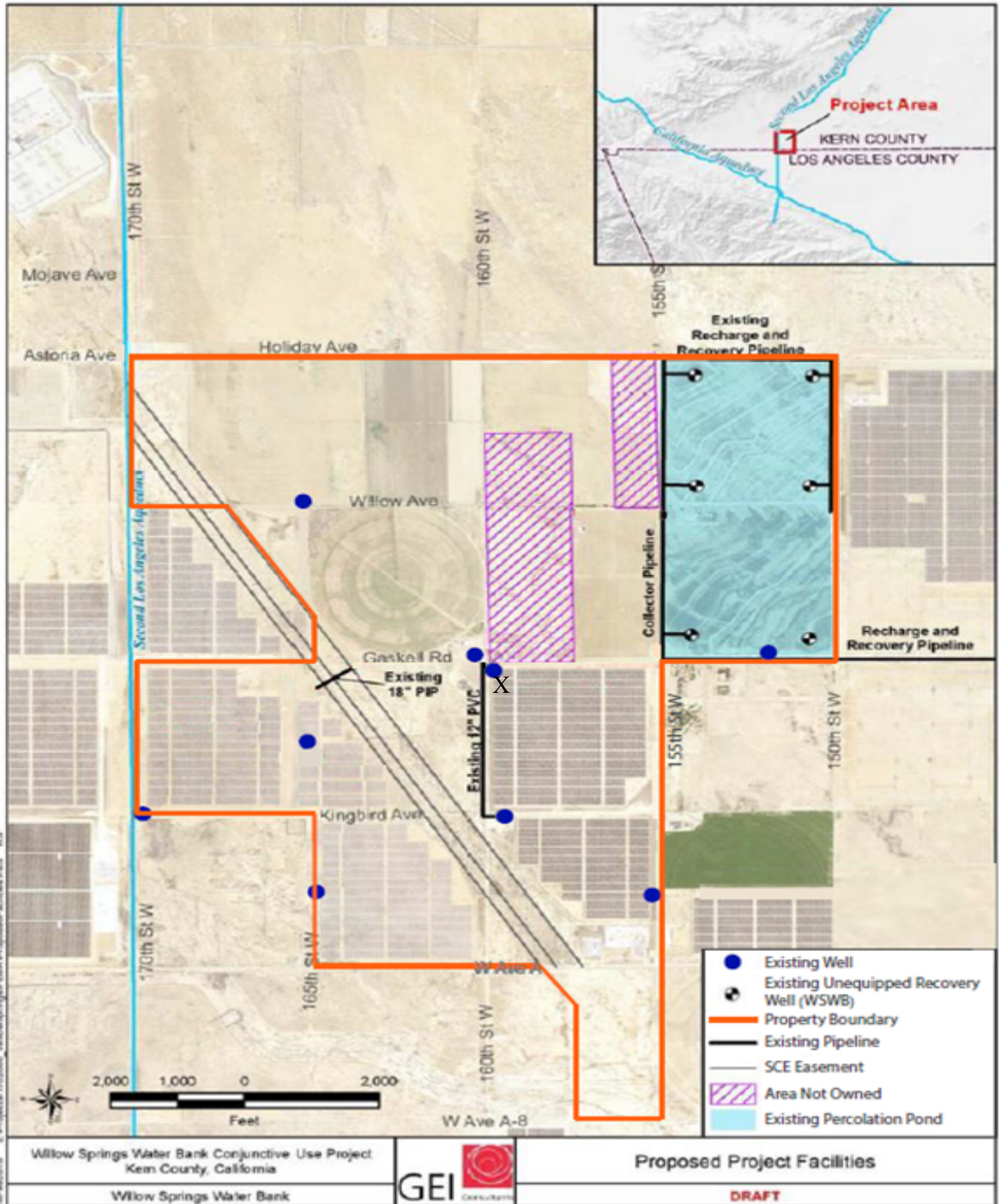
Cost Analysis Summary

ANTELOPE VLY WATER STORAGE LLC

Pumping Plant Name	Ref#	Test Date	Pump Location	Contract ID	Rate	Motor HP	kWh / Year	kWh / Acre Ft.	Annual Acre Ft.	kWh Cost	Aug \$ / Acre Ft.	Annual Cost	Test Eff. %	Impr. Eff. %	kWh Annual Savings	Est. \$ Annual Savings	Est. Project Cost	Simple Payback Years
WELL G160SE	2710	10/7/21	707H ST W, ROSAMOND, CA 92388	8002087301	TP2E49	200	532,512	764	697.0	\$3,145	\$118.58	\$77,088	59.2	70.0	\$1,980	\$11,856	\$93,091	5.1
WELL 160 KINGBIRD	2914	11/8/21	189W 102ND A, ROSAMOND, CA 92360	8001939331	TP2E49	150	12	798	0.0	\$3,180	\$141.88	\$2	48.9	70.0	4	\$1	\$45,000	66432.4
WELL AVE A 165	25880	11/8/21	EIS 165TH W 14th, ROSAMOND, CA 92360	8001323688	TP2E49	200	12	991	0.0	\$3,180	\$108.20	\$2	49.5	69.0	3	\$1	\$60,000	90202.9
KINGBIRD 170 WELL	2870	11/8/21	170TH W 102ND AVE A	8002985989	TP2E49	200	12	934	0.0	\$3,180	\$188.11	\$2	58.7	69.0	2	\$0	\$80,000	188544.0
WELL G152	25881	11/9/21	DARKELL & 152ND ST W, ROSAMOND, CA 92360	8002925397	TP2D49	250	12	794	0.0	\$3,180	\$142.88	\$2	65.5	75.0	2	\$0	\$75,000	274914.1

Appendix H. Plot Plan

Gaskell & 160SE APH



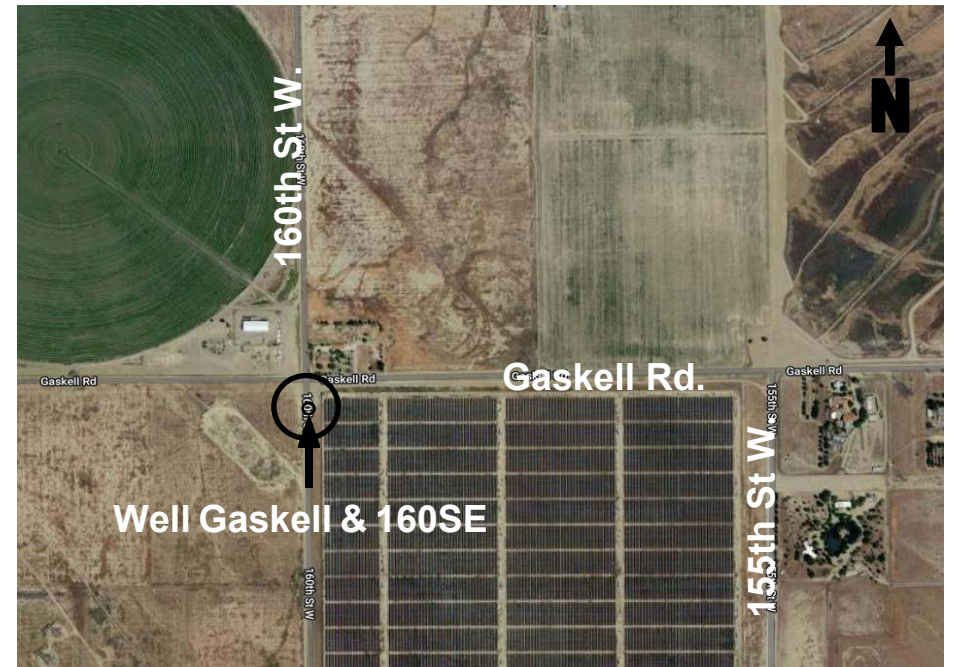
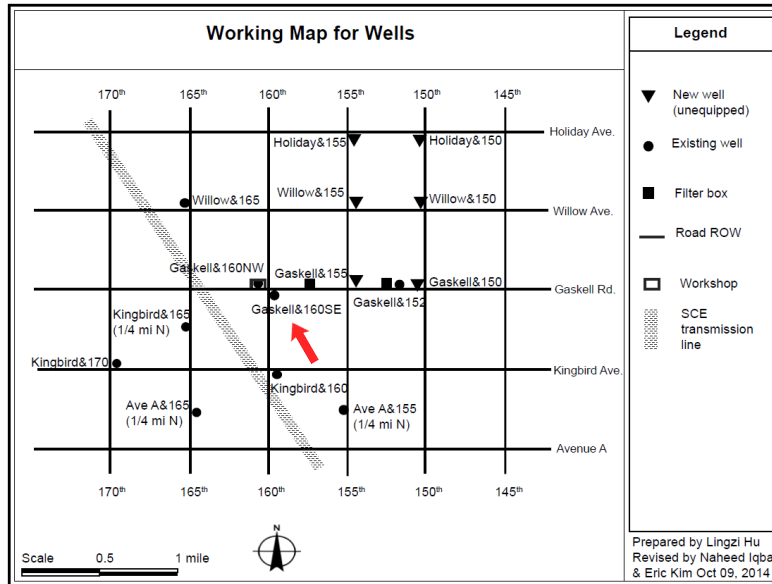
Well Gaskell & 160SE

DWR#: T09NR14W31D001S

Status: Operational,
not currently in use

SCE Meter #: 345M-001174

Updated: 04/14/2022



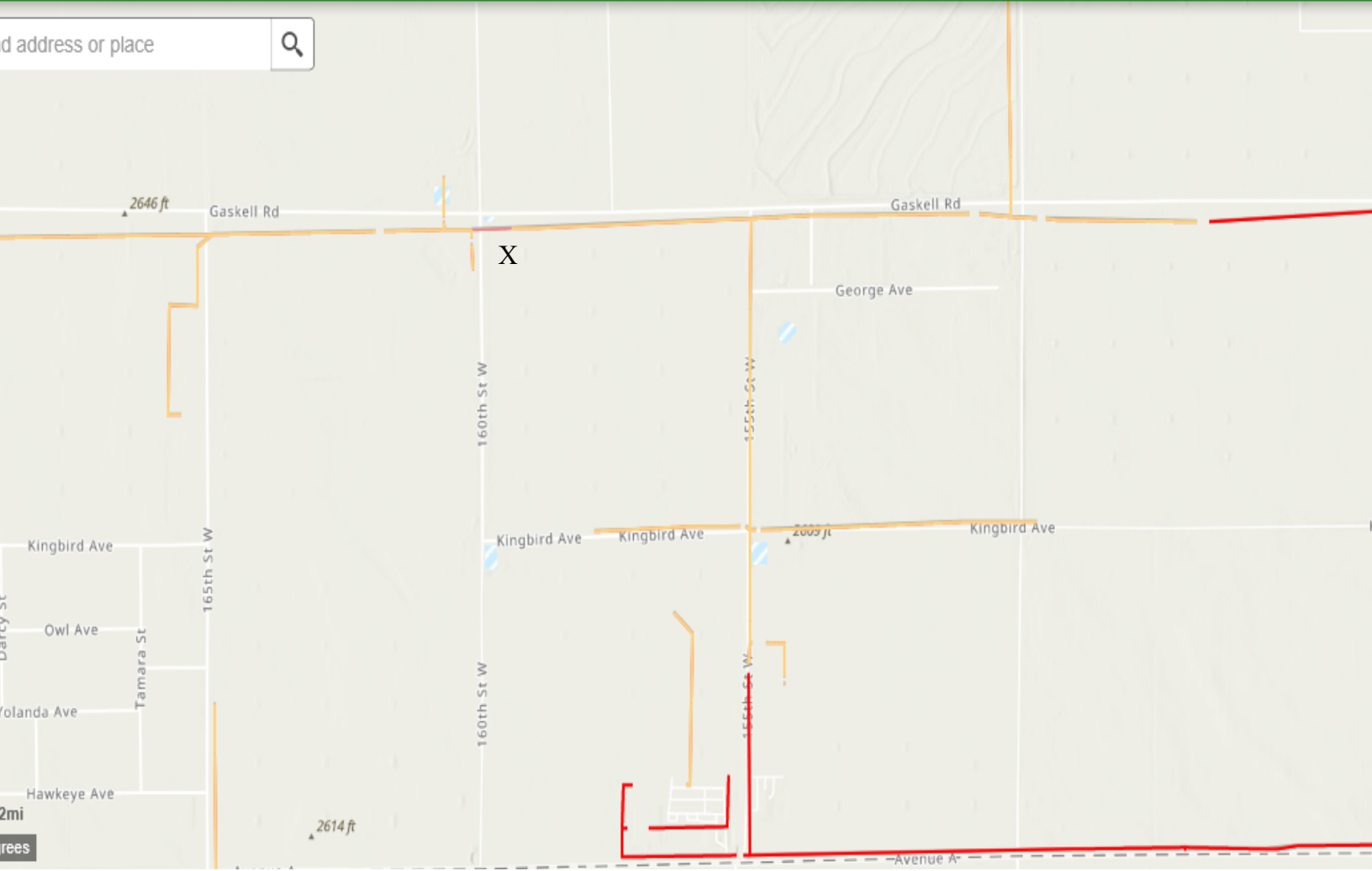
Aerial View



Overview — April 14, 2022



Near View – April 14, 2022





GASKELL

160th

EXISTING WELL

EXISTING UTILITY METER TO BE ABANDONED

EXISTING SCE UTILITY TRANSFORMERS
480VAC, 3PH, 4W

"MSB-160" SWITCHGEAR

SCE METER

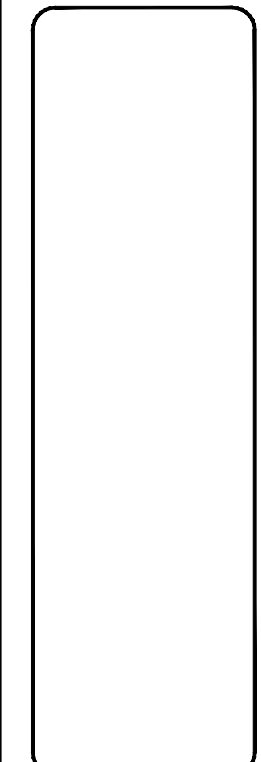
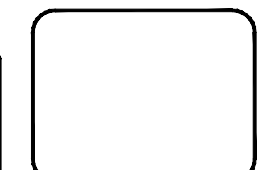
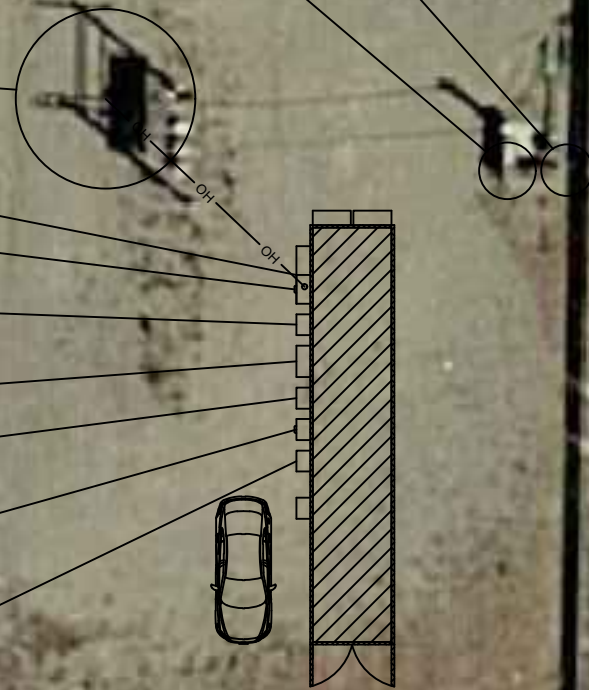
MANUAL VISIBLE LOCKABLE DISCONNECT

ATS

SOLAR LINE SIDE METER DISCONNECT

SOLAR NGOM SCE NET METER

SOLAR LOAD SIDE METER DISCONNECT



WAPTIC CONSULTING
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 (208) 651-1120

NO.	DATE	REVISION	BY

DWG TITLE
**WILLOW SPRINGS
 160th & GASKELL
 PLOT PLAN
 LAYOUT**

ENGINEER	MPJ	CHECKED BY	MPJ
JOB NO	TBD	DRAWN BY	NER
SCALE	NO SCALE	DATE	08/29/2022
DWG NO	C-04		
SHEET NO	4 OF -		

C:\USERS\KORTE\ONEDRIVE\DOCUMENTS\ACADE 2017\AEDATA\PROJ\CANYON RIDGE\E-10 SITE OVERVIEW.DWG

Appendix I. Utility Interconnection Approval Notification



Valued SCE Solar Customer or Contractor,

We have reviewed your application for NST-290291. The next step is installation of your Net Generation Output Meter (NGOM). Before the NGOM can be installed, SCE's Local Planning Department must receive:

1. Payment for the NGOM invoice.
2. A new electrical service panel permit inspection release, sent to us directly from the Authority Having Jurisdiction (AHJ), which is your city or county Department of Building and Safety or authorized representative.

Note: After the AHJ performs the inspection and provides approval, please be sure to follow up with the AHJ to confirm the approved new service panel permit was sent to SCE's Local Planning Department.

REMINDER: For New Construction - The new address must be unique (not already in use), match the permit address provided by the AHJ and ultimately, match the address to be requested for service with SCE. The unique service panel address in the AHJ permit must also match the address entered in the CPIS form, if applicable. If the address does not match, project delays may occur.

SCE's Local Planning Department has been notified to start your NGOM installation process.

- The Local Planner or Field Technician will identify a meter spot for the new NGOM panel location. The planner/technician may contact the person listed on the Customer/Project Information Sheet (CPIS) submitted with your application to discuss the installation or arrange a site visit.
- The Local Planner will send you an email with the NGOM invoice (along with payment instructions) within seven business days after completing the meter spot.
- The Local Planner will contact you directly if additional documentation is required.

Next Steps

Once SCE's Local Planning Department receives all required items listed above, the following steps will be completed (normally within 10 – 15 business days):

- The Local Planner will send a Meter Service Request (MSR) to SCE's Meter Engineering Department, who will process the job and send the order and NGO meter kit to the assigned Meter Technician.

- The Meter Technician will contact the person listed on the CPIS to schedule the NGOM installation site visit.
- *During the site visit, the Meter Technician will assess the electrical installation to ensure compliance with [SCE's Electrical Service Requirements](#); if in compliance, the installation will proceed. If not, the Meter Technician will provide information on how to address the issues.*

Important Considerations

- We strongly recommend your ***certified electrician*** be on site during SCE's Meter Technician visit to avoid installation delays. If multiple site visits are required, SCE may invoice for additional labor.
- *If the Meter Technician finds your installation is not in compliance with [SCE's Electrical Service Requirements](#), your installation will be placed on hold until all issues are addressed.*
- Only equipment authorized by SCE can be connected to the NGOM meter socket.
- For Net Energy Metering paired with energy storage projects, please refer to the [Net Energy Metering \(NEM\) Handbook](#), Figure 8 ("NEM Paired Storage (AC) NGOM AC Disconnect Diagram") for proper NGOM wiring guidelines.

Final Documentation

Once the NGOM invoice is paid, SCE's NEM Interconnection Department will send you an Interconnection Facilities Financing Ownership Agreement (IFFOA) for you to sign and your contractor to upload with your application. A Permission to Operate (PTO) will not be issued without the signed IFFOA submitted with your application.

Helpful Resources

- For more information about the NGOM installation process and general NEM requirements, please refer to the [NEM Interconnection Handbook](#).
- To check your project status, please use [SCE's Online Interconnection Application](#)

This is a system-generated message. If you have questions about this email or your project, please contact NEM@SCE.com.

Sincerely,

Eduyng Castano
Senior Manager of Customer Generation Programs
Southern California Edison

Appendix J. Expedited Interconnection Dispute Resolution Form

EIDR Process

60-70 Calendar Days

1. Applying for Expedited Dispute Resolution

Applicant completes machine-readable pdf form (posted on R21 webpage) and emails to Rule21.Disputes@cpuc.ca.gov.

30 Calendar Days

2. Eligibility

Within 3 business days, Energy Division notifies the applicant and utility whether the dispute is complete and eligible via Rule21.Disputes@cpuc.ca.gov. For eligible projects, ED selects a 4-member Review Sub-Panel and notifies the utility it has 5 business days to submit its response.

3. Sub Panel Review & Recommendation

Within 30 calendar days of the Commission receiving the dispute, the Sub-panel reviews the dispute and submits a recommendation for resolution to the Executive Director.

30 Calendar Days

4. Submitting Comments on Sub-Panel Recommendation

The utility, the applicant and any interested parties may submit written comments on the Sub-Panel's recommendation within 5 business days of its issuance via Rule21.Disputes@cpuc.ca.gov.

5. Order from the Executive Director

Within 30 calendar days of receipt of the Sub-Panel's recommendation, the Executive Director issues an Order via Rule21.Disputes@cpuc.ca.gov to the utility and/or applicant resolving the dispute.

0-10 Calendar

6. Appealing the Executive Director's Order

Any interested party seeking Commission review of the Executive Director's Order shall submit via Rule21.Disputes@cpuc.ca.gov the request for review within 10 calendar days of the Order's issuance. Any [unresolved] protest submitted by an interested party would require a Resolution on the matter for a vote of the Commission.