

Memorandum

DOCKET

11-SPPE-01

DATE Jan. 23 2012

RECD. Jan. 23 2012

To: Energy Commission Dockets Unit

Date : January 23, 2012

Telephone: 916-651-8853

From : **California Energy Commission: Robert Worl, Program Manager**
1516 Ninth Street
Sacramento CA 95814-5512



Subject: Please Docket the attached items with this Memorandum attached, for the Xeres Ventures, LLC, Santa Clara SC-1 Data Center, Phase 2, Application for a Small Power Plant Exemption (**11-SPPE-01**).

Attached to this Memorandum are collected four items that can be docketed, with today's date, as a single file with this memorandum as a cover sheet. All information was supplied by Xeres Ventures, LLC in response to discussions with staff and intended to supplement and clarify information contained in the SPPE Application:

Information contained in the attachment to this memorandum is as follows:

1. A two-page email exchange – Nora Monette to R. Worl: Temporary Construction Driveway Description, sent to Robert Worl on 1/20/12;
2. A Revised Single-line Primary Distribution Diagram for the SC-1 Data Center;
3. A Typical Uninterrupted Power Supply one-line diagram;
4. Recycled Water Use for Building Cooling (Phase 2) and a Cooling Water Calculation Worksheet.

From: Nora Monette <nmonette@davidjpowers.com>
To: Robert Worl <Rworl@energy.ca.gov>
CC: Shaelyn Strattan <SStratta@energy.ca.gov>
Date: 1/20/2012 3:06 PM
Subject: RE: SC-1 Cultural question

Bob,

Here is the requested information on the proposed temporary construction driveway.

The temporary construction driveway would extend for approximately 20 feet from the Mathew Street sidewalk to the paved driveway bordering the Data Center driveway. The construction driveway would be approximately 24 feet in width. Soil materials in the landscape area would be excavated to a depth of 6-12 inches.

The area crossed by the proposed driveway was formerly a parking lot for an industrial building at 500 Mathew Street. Pavement was removed from this area as a part of construction of the data center facility and replaced with clean soil materials prior to landscaping. Excavation for the temporary driveway would not extend below the level previously excavated during site development.

Please contact me with any questions.

Regards,

Nora Monette

Principal Project Manager

David J. Powers & Associates

1871 The Alameda, Suite 200

San Jose, California 95126

phone: 408.248.3500 ex. 132

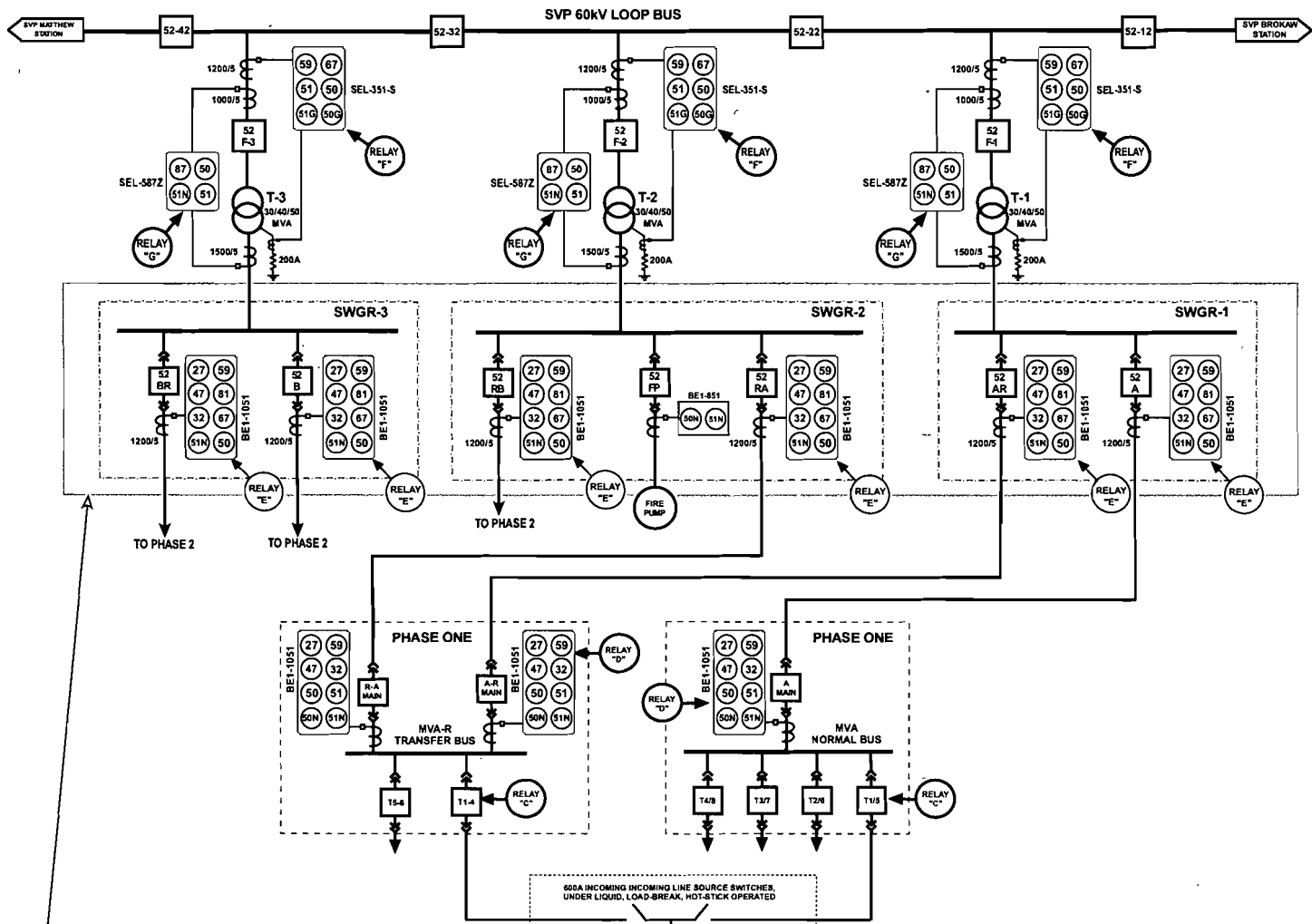
fax: 408.248.9641

From: Robert Worl [mailto:Rworl@energy.ca.gov]
Sent: Wednesday, January 18, 2012 4:57 PM
To: Nora Monette
Cc: Shaelyn Strattan
Subject: Fwd: SC-1 Cultural question

Nora, here is a late-breaking question, I have only the info contained in the application. Can you fill in any of these blanks??? Thanks!
bobw

>>> Shaelyn Strattan 1/18/2012 4:06 PM >>>

Bob - The SPPE application indicates that a temporary construction driveway will be constructed in a previously landscaped area on the project site. It is only noted on the site plan as a "star". Could you please verify the path of the temporary construction driveway (from Mathew Road to where?), depth of previous soil disturbance along the driveway location, and depth of proposed grading/ground disturbance for the driveway? Thanks - Shaelyn



NOTE TO SVP:

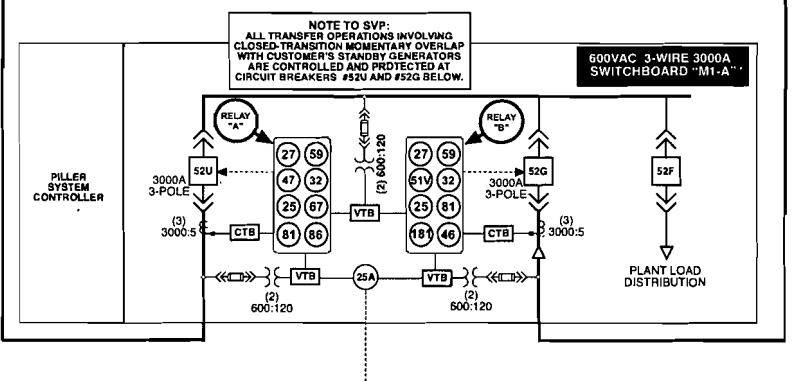
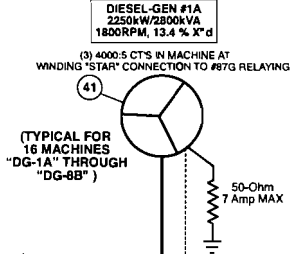
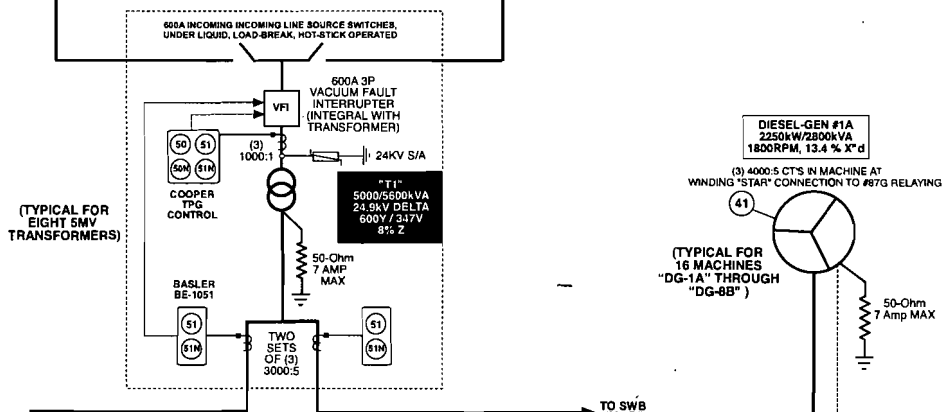
AGREEMENT REACHED DURING JULY 14 MEETING THAT 25KV BUS LEVEL BELOW POWER TRANSFORMERS BECOMES NEW "POINT OF COMMON COUPLING".

ALL PROTECTIVE FUNCTIONS AT 600V LEVEL REMAIN IN PLACE, AS PREVIOUSLY DISCUSSED, EXCEPT THAT REVERSE POWER SETTINGS IN ALL RELAYS "A" CHANGE TO 400KW WITH 1.5 SEC DELAY.

NEW PROTECTIVE FUNCTIONS ARE ADDED AT ALL RELAYS "E" TO COMPLY WITH SVP REQUIREMENTS INCLUDING BACKUP REVERSE POWER TRIP SET AT 500KW, WITH FIXED DELAY OF 2.0 SECONDS.

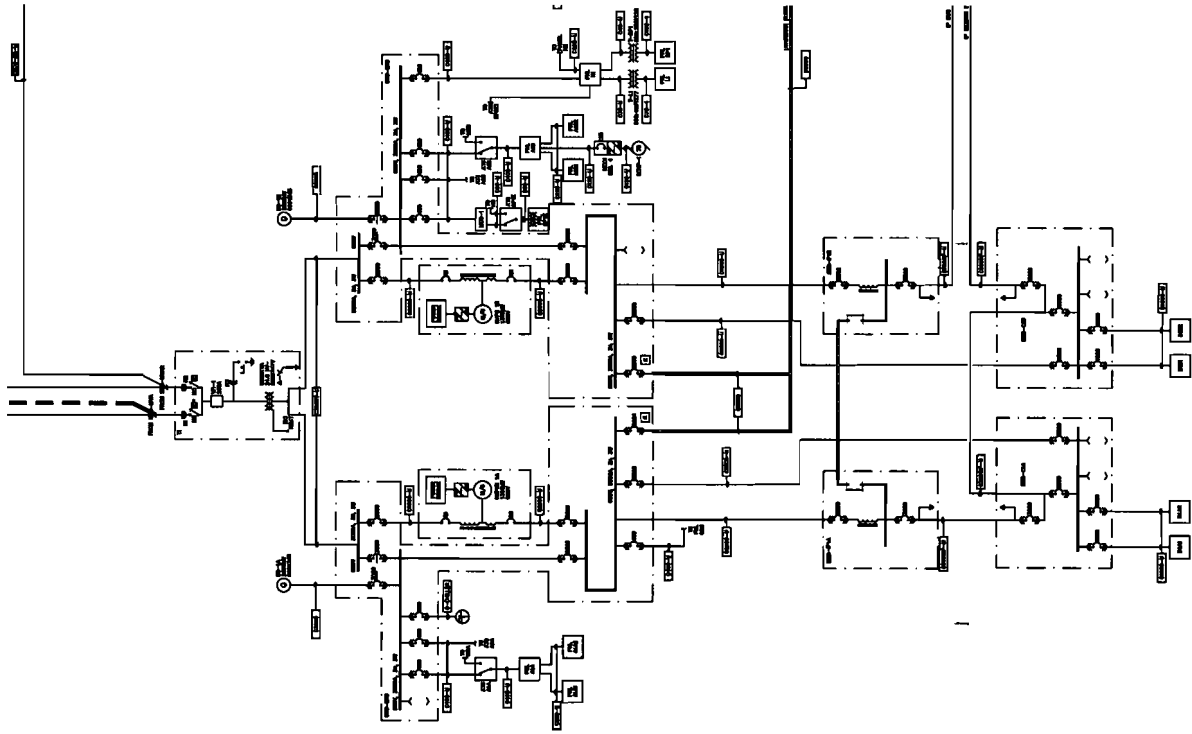
SVP-REQUESTED #51V FUNCTION HAS BEEN ADDED, DIRECTLY AT THE 600V GENERATOR BREAKER #52G (RELAY "B" BELOW, RIGHT).

REVERSE POWER SETTING AT 600V UTILITY MAIN BREAKER #52-J (RELAY "A" BELOW) REVISED TO 400KW AT 1.5 SEC FIXED DELAY.



DUPONT FABROS / SC-1 PLANT
REVISED PRIMARY DISTRIBUTION SINGLE-LINE
 JJ GUENTERT / POWER DISTRIBUTION SYSTEMS
 REV #06 - JULY 21-2011

NOTE TO SVP:
 ALL TRANSFER OPERATIONS INVOLVING CLOSED-TRANSITION MOMENTARY OVERLAP WITH CUSTOMER'S STANDBY GENERATORS ARE CONTROLLED AND PROTECTED AT CIRCUIT BREAKERS #52U AND #52G BELOW.



SC1 TYPICAL UPS

1.0 RECYCLED WATER USE FOR BUILDING COOLING (PHASE 2)

1.1 Source of Recycled Water

The City of Santa Clara Recycled Water Utility purchases water from the South Bay Water Recycling (SBWR) program and distributes it to customers within the city, including the Santa Clara SC-1 Data Center. The SBWR program was initiated to reduce the discharge of treated water flowing from the San Jose/Santa Clara Water Pollution Control Plant (WPCP) into San Francisco Bay. The WPCP operates under a discharge limit of 120 million gallons a day during the summer to help maintain the salt marsh habitat of the South Bay.

In 1989, the City of Santa Clara completed the first significant recycled water transmission and delivery system in the South Bay.¹ The system utilized treated water from the jointly owned San Jose/Santa Clara Water Pollution Control Plant to irrigate the Santa Clara Golf & Tennis Club and for other non-potable applications within the City of Santa Clara. Currently, more than 100 miles of recycled water pipelines deliver SBWR recycled water for landscaping, playing fields, golf course, cemeteries, industrial processing, dual-plumbing, agriculture and other non-drinking water purposes. Program participants and partners with the City of Santa Clara include the City of San José, City of Milpitas, West Valley Sanitation District, Burbank Sanitary District, Cupertino Sanitary District, Sunol Sanitary District, County Sanitation District No. 2-3, San Jose Water Company, Santa Clara Valley Water District, Environmental Protection Agency, California Department of Water Resources, Department of Health Services, Regional Water Quality Control Board, Santa Clara County Health Department and United States Bureau of Reclamation.² In Santa Clara, recycled water is available for non-potable uses by businesses, industries, parks, and schools along pipeline routes in the area north of Central Expressway and along Lafayette Street, and along Saratoga Avenue in Santa Clara. All SBWR recycled water in is treated to a disinfected tertiary level before being delivered to customers.

A new SBWR Advanced Water Treatment Facility is currently under construction near the WPTP on Zanker Road in the City of San José. This facility will produce highly purified water that will be blended to provide recycled water with lower salinity to customers. The Advanced Water Treatment Facility is scheduled to be completed in 2012.

1.2 Total Dissolved Solids in Recycled Water

The incoming recycled water quality at the Santa Clara SC-1 Data Center, expressed as total dissolved solids (TDS) currently is about 770 parts per million (ppm).³ TDS will be reduced in 2012 by 40-50 percent when the Advanced Water Treatment Facility becomes operational. This will reduce the TDS in blow-down from the cooling towers.

¹ City of Santa Clara "Recycled Water Utility" Available at: <<http://santaclaraca.gov/index.aspx?page=1058>>

² City of San José. *Final Program EIR for the Envision San José 2040 General Plan*. September 2011. Page 322.

³ Rick Nalven, Western Regional Manager, Chemtex Corporation, email communications, December 16, 2011. Additional water quality information on SBWR recycled water is available at: <<http://www.sanjoseca.gov/sbwr/water-quality.htm>>.

1.3 Volume of Recycled Water Used for Cooling Tower Operation

The maximum volume of recycled water used in the Phase 2 cooling towers for evaporation and makeup at 100 percent load and the towers operating at design conditions (79 degrees wet-bulb temperature) is estimated to be 58,278,528 gallons per year (178.8 acre-feet).⁴ The actual annual volume of water used likely would be about half of this amount because the computer server room load would not reach 100 percent during operation (e.g., 100 percent occupancy and load) and the wet-bulb temperature will not always be the design temperature of 79 degrees.

⁴ Rick Nalven, Western Regional Manager, Chemtex Corporation, "Cooling Water Calculation Sheet", December 16, 2011.



Cooling Water Calculation Worksheet

Facility: **DFT SC1 Ph 2**
 System: **Condenser Water**
 Contact:

CR = Circulation Rate
 E = Evaporation Rate
 B = Bleed Off Rate
 Mu = Make Up Rate
 C_{MU} = Cycles Based on Make Up
 GPM = Gallons Per Minute
 GPY = Gallons Per Year

Calculate Evaporation, Bleed Off Rates & Make Up Rates:

4.0 Cycles

CR = 6600 Tower/Condenser Tons x 3 = 19800 GPM (Centrifugal)
 or CR = 0 Tower/Condenser Tons x 6 = 0 GPM (Absorption)

E = 19800 CR in GPM x .01 x 4.2 Delta T/10 = 83.16 GPM
 B = 83.16 E in GPM = 27.72
 (4.0)
 / $C_{MU} - 1$

MU = 83.16 E in GPM + 27.72 B in GPM = 110.88 GPM

110.88 MU in GPM x 60 Min. x 24.0 Hours x 365.0 Days-Yr. X 100.0 % Load
 Hour Day 100

= 58,278,528.00 MU in GPY

Calculate Evaporation, Bleed Off Rates & Make Up Rates:

 Cycles

CR = Tower/Condenser Tons x 3 = 0 GPM (Centrifugal)
 or CR = 0 Tower/Condenser Tons x 6 = 0 GPM (Absorption)

E = 0 CR in GPM x .01 x 4.2 Delta T/10 = 0.00 GPM
 B = 0.00 E in GPM = 0.00
 (0.0)
 / $C_{MU} - 1$

MU = 0.00 E in GPM + 0.00 B in GPM = 0.00 GPM

0.00 MU in GPM x 60 Min. x Hours x Days-Yr. X % Load
 Hour Day 100

= - MU in GPY

Difference of: (58,278,528.00)
 Cost per 1000 Gallons:
 Value of Savings in water at higher cycles: