City Council Staff Report

Date: June 18, 2014 UNFINISHED BUSINESS

Subject: SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT AB 1318 MITIGATION FEES FUND-SENTINEL POWER PLANT

From: David H. Ready, City Manager

Initiated by: Public Works and Engineering Department

SUMMARY

The City Council will receive an update on the status of the AQMD Solar Grant projects, and consider authorizing staff to issue an RFP for the design-build construction of four solar voltaic projects.

RECOMMENDATION:

1. Authorize staff to issue an RFP

STAFF ANALYSIS:

The South Coast Air Quality Management District (AQMD) approved the City's application for four solar voltaic projects as follows:

1) $284,915 for the Palm Springs Visitors Center
2) $311,680 for Fire Station #3
3) $190,365 for Train Station
4) $388,265 for the James O. Jessie Desert Highland Unity Center

City Council authorized the agreement with AQMD on September 18, 2013. The City received the executed agreement from AQMD in November 2013. Subsequent to receipt of the executed agreement, AQMD sent City staff documents for City's use in preparing the Request for Proposals.

On January 23, 2014 staff entered into a contract with Terra Nova Planning and Research (the firm that prepared the successful grant applications on the City's behalf) to prepare a Request for Proposals (RFP) for design and construction of the approved solar voltaic projects.

A draft RFP was received from Terra Nova in February 2014 and staff's comments were made and transmitted to Terra Nova in March. A revised RFP was received and final comments made on the document sent to Procurement in May.

ITEM NO. 4E

AQMD notified staff on May 23 that they would prefer to see the document before it is put out for advertisement. Engineering staff has worked on getting a couple final questions answered by AQMD staff so that Procurement Department can complete the document for AQMD review and subsequently advertising for proposals The current schedule is as follows: 1) RFP completed by Procurement and sent to AQMD-June 19, 2) AQMD completes review and approves for advertising-June 26, 3) Proposals due 1st week in August, 4) Award by Council 1st meeting in September. Construction is expected to be completed by January 2015. The City/AQMD Agreement requires all projects to be complete on or before October 10, 2017.

Attached to this staff report are the project descriptions as they were submitted to AQMD. Project #'s 2 and 4 are proposed to be roof mounted solar voltaic power arrays. The train station (project # 3) solar panels are proposed to be mounted on carport like shade structures due to the limited building roof area while project # 1 will have similar mountings to the train station or some other panel mounting not on the roof due to the historic nature of the structure.

SUBMITTED:

Prepared by:

David J. Barakian
Director of Public Works/City Engineer

Approved by:

David H. Ready
City Manager

Attachment:

1) AB 1318 Mitigation Fees Fund Proposal

II. PROJECT 1: INSTALLATION OF SOLAR PHOTOVOLTAIC ARRAY AT THE PALM SPRINGS VISITORS CENTER

FUNDS REQUESTED: $284,915

A. Summary

The City requests $284,915 of AB1318 Mitigation Fee funding for the design and installation of a solar photovoltaic (PV) system at the Palm Springs Visitors Center. The project is located entirely within the designated six-mile radius of the Sentinel power plant, and the City is requesting 100% funding from the "close proximity" fund category. Financial energy efficiency incentives from third party sources may be available for the project that could reduce overall costs from those requested. If still in place at the time the grant is awarded, these cost savings will be disclosed to AQMD staff and implemented before grant funding is provided to the City.

The proposed project will demonstrate the City's leadership in, and commitment to furthering renewable energy solutions. The project will consist of the design and installation of a grid-tied system of sufficient size to generate the equivalent power supply needed to power this building. This project will offset the City's annual power consumption and reduce air emissions associated with traditional power supplies. Additional benefits of the PV system will include improvements to air quality by eliminating the use of coal and gas, and the creation of local jobs by generating a demand for solar module planners, installers, and mechanics. The use of the PV system will indirectly benefit City residents by freeing up revenue previously spent on operational electricity costs at the Visitors Center and making them available for other City programs and expenses.

B. Project Description

The Visitors Center is located at 2901 North Palm Canyon Drive, at the northwest corner of North Palm Canyon Drive and Tramway Road (see Exhibit 1). The historic building is located at the primary entrance to the City and serves as a prime tourism contact point for hotels, retailers and restaurants. It provides information regarding City accommodations, dining, shopping, recreation, entertainment, and other local and regional attractions, and attracts more than 125,000 visitors each year.

Palm Springs Visitor Center

Visitor Center Parking Lot

Built in 1965, the Visitors Center was designed in the Desert Modernism architectural style by noted architects Albert Frey and Robson Chambers, and operated as the Tramway gas station for 20 years. It was purchased, restored, and updated by the City in 2003, and is designated as a Palm Springs Historic Resource. It is a single-story, stand-alone building of approximately 2,730 square feet[5] with an adjacent ±40-space parking lot to its west. The building is southeast facing with a "butterfly" roof design which is inverted and slightly sloping down toward the middle of the building from two sides.

The City will issue a Request for Proposals (RFP) to solicit bids from multiple local (within the Coachella Valley) solar PV system vendors and award a contract. Under the guidance and expertise of the selected firm, the City will identify appropriate and effective types and quantities of PV modules suitable for this particular building and site, taking into consideration the need to accommodate the tilt necessary to maximize solar irradiance. Given the building's status as a Palm Springs Historic Resource and the importance of maintaining the integrity of its unique roofline, the proposed PV array will not be roof-mounted. Rather, it will consist of multiple elevated, steel carport-like structures in the existing parking lot, upon which will be mounted the solar PV panels. Examples of similar structures in the Coachella Valley are provided in the photos below. A range of product options are available, as described in the "Technologies to be Implemented" section below.

Examples of Parking Lot Solar Panel Mounts

[5] Palm Springs Building Department, May 17, 2012.

Once the specific system parameters have been selected, the array will be installed and become operational. It will operate year-round and generate electricity during daylight hours when electricity demand is at its peak. It is expected that 100% of the energy demand generated by the Visitors Center will be met by the proposed PV system.

1. Technologies to be Implemented

A typical solar PV array consists of pre-assembled PV modules (monocrystalline or polycrystalline), module cabling (on the direct current side), an inverter which converts direct current (DC) electricity to alternating current (AC) electricity, a connection to the electricity network (on the alternating current side), mounting equipment, and optional batteries for energy storage or backup power in case of power interruptions. The PV system will be interconnected to the local Southern California Edison (SCE) electricity grid. Systems are designed to over-produce during daylight hours, and energy surpluses generated during the day are fed into the grid; during the evening hours, electricity "credits" are returned to the meter for cost savings.

Preliminary product specifications were obtained from solar providers in the Coachella Valley for the purpose of estimating system parameters required for this project. The data received are summarized in the table below. The system will provide between 64,000 and 66,726 kWh annually, and will be sized to meet all energy demands generated by the Visitors Center (in 2011, the Visitors Center consumed 62,320 kWh).

Table 2
Palm Springs Visitors Center
Solar PV System – Preliminary Product Specifications

	Total System Size*	Panels	Inverters	% of Energy Recovered
Option 1	41.000 kW DC Power (STC) 34.952 kW AC Power (CEC size)	Quantity 164: LG Electronics Solar Cell Division Model: LG250S1C-G2 250W Monocrystalline Module	Quantity 164: Enphase Energy Model: M215-60-2LL-S22	106%
Option 2	40.06 KW-DC Power	Quantity: 154 Schuco Solar, MPE 260 MS 08 Monocrystalline Module	---	102%
Option 3	43.12 kW Power	Quantity: 176 Mage 245 watt	---	---

*size needed to produce enough electricity to offset annual electricity use
--- = information not provided.
Source: preliminary estimates provided by local contractors

The actual PV system selected will be determined following careful consideration of contract proposals, which will be solicited from local solar providers once grant funding is secured. It is expected that one of the above systems or a system of similar scale and specification will ultimately be utilized.

2. Projected Emissions Reductions

The selected PV system is expected to generate 100% of the Visitors Center's energy consumption, and will therefore eliminate the use of electricity produced by coal, gas, and other fossil fuels that emit air pollutants when converted to energy.

Emissions reductions were estimated for this project using the Clean Air and Climate Protection (CACP) Software, Version 1.1 developed by Torrie Smith Associates, with support from the U.S. Environmental Protection Agency (EPA), for the International Council for Local Environmental Initiatives (ICLEI), State and Territorial Air Pollution Program Administrators (STAPPA), and the Association of Local Air Pollution Control Officials (ALAPCO).

To quantify emission reductions resulting from implementation of the covered parking solar at the Visitors Center, it was assumed that 62,320 kwh generated by an average electricity grid mix representative of NERC (North American Electricity Reliability Council) region 13 was replaced by 62,320 kwh generated by "green electricity."

The following table provides the estimated annual emission reductions of criteria pollutants and greenhouse gases that will result from implementation of solar at the Palm Springs Visitors Center. Output tables are also provided in Appendix B.

Table 3
Palm Springs Visitors Center
Emission Reduction Estimates
From Proposed Solar PV Installation Project

Reductions (pounds per year)[1]					
CO2e	**CO**	**VOC**	**NOx**	**SOx**	**PM_{10}**
64,422	37	4	59	37	27

Sources: Clean Air Climate Protection Software and City data on 2011 energy demands for Visitors Center.
[1] Reduction estimate is from the CACP software assuming the replacement of the average electricity grid mix with "Green" electricity. Assumes PV system generates a minimum of 100% of facility energy needs.

3. Secondary Benefits

The proposed project will have numerous secondary benefits, most notably a reduction in the City's annual power consumption and a reduction in air pollutant emissions from traditional power supplies, which are quantified above. The solar PV system will generate electric power without generating noise, air pollution, or hazardous waste, while also reducing reliance on, and

consumption of non-renewable fossil fuels. The project will contribute to a reduction in demand for local and regional electric supplies. Electricity to the site is currently provided by SCE, which uses a wide range of energy resources to produce electricity throughout its service area. The upper Coachella Valley is currently served by an electrical system of interconnected substations and 115kV subtransmission lines that are becoming overloaded beyond its capacity, especially during peak demand periods. SCE is currently reconfiguring the existing system to relieve overload conditions on existing lines.[6]

In 2011, the Visitors Center used 62,320 kWh of electricity generated by operational uses, including heating and cooling, lighting, and electronics, such as computers, printers and other equipment. Its conversion to a grid-tied solar PV system will eliminate the net demand from the local power grid, and constitute an incremental step toward reducing the strain on local and regional electricity supplies, including the peak day demand. Similarly, the project will contribute to an incremental improvement in local and regional public health resulting from a reduction in criteria pollutant emissions.

Above-parking solar mounts will reduce temperatures in the parking lot, resulting in a reduction in heat island effects. The PV system will also provide shaded parking for vehicles, which will reduce the strain on vehicle cooling systems in the intense desert environment.

The project will also result in direct cost savings to the City, thereby "freeing up" public moneys for other projects and programs. It is expected that 100% of the energy demand generated by the Visitors Center will be met by the proposed PV system. Based on the 2011 average price per kWh of $0.18, the annual cost savings with installation of the PV system will be $11,467. These monies, currently used to pay for utility bills, will be available for other programs and expenses in a time when City revenues are limited, and programs have been reduced or eliminated.

4. Estimated Job Creation

Solar energy can be an effective economic development driver as it employs a wide range of workers, many of which are skilled and/or high-tech positions requiring advanced education, training, or certification.

Direct Employment

It is anticipated that construction of the Visitors Center solar array will result in the direct employment of 6 solar vendor personnel, including 2 solar engineers/designers and 4 equipment installers. The City is committed to selecting a local Coachella Valley vendor, and it is expected that all solar vendor employees will be local residents. Project administration and oversight will

[6] http://www.sce.com/PowerandEnvironment/Transmission/ProjectsbyCounty/RiversideCounty/DeversMirage/default.htm, accessed April 23, 2012.

also require the time and skills of 4 City employees in the Public Works Department who are local Coachella Valley residents.

Indirect Employment

Although not quantifiable, project build out will also indirectly contribute to the employment of other individuals in the solar technology industry. The project will increase the demand for solar panels, associated hardware, and ongoing maintenance services, thereby providing work opportunities for equipment engineers and assemblers, truck drivers and construction equipment operators, and roofers and mechanical technicians.

Economic Multipliers

Build out of the Visitors Center solar array will not only generate project-related jobs, but will also result in a spending "multiplier effect" in the community and region. The economic multiplier effect occurs when a worker's disposable income is spent on local goods and services, such as food, housing, and clothing, and then it "trickles down" throughout other sectors of the economy.

Economic analysis often considers a multiplier of 2.5 in assessing the potential benefits associated with indirect expenditures; that is to say that every dollar spent results in actual spending of $2.50 because of the "domino" effect of additional revenue. Average wages for solar engineers/designers in the Coachella Valley are $89/hour, and it is anticipated that project design will require a total of 235 hours of engineering time; this equates to $20,915 in engineering salaries. Hourly wages for solar installers in the Coachella Valley are $40/hour. It is anticipated that a total of 480 hours will be needed for installation of the Visitors Center solar array, resulting in payment of $19,200 to solar installers. Total payments to solar vendors, therefore, are estimated at $40,115. If 20% of these salaries, or $8,023, is expendable income spent on goods and services throughout the Coachella Valley, a multiplier of 2.5 means that $20,058 will be recycled through the local and regional economies.

Increased spending and demand for services and goods could also translate into more local jobs. Based on an analysis of economic data for the Coachella Valley, the region's base employment multiplier is 1.7.[7] This means that for every new job created in the region, 0.7 additional jobs will be generated indirectly as "new" money is spent in the economy. As the Visitors Center solar project is expected to directly employ 6 solar vendor personnel, this could translate into the creation of 4.2 new jobs elsewhere in the community.

[7] "Coachella Valley Economic Blueprint," prepared by Market Street Services, Inc. for Coachella Valley Economic Partnership, 2008.

C. Statement of Work

To complete the proposed project, the City Public Works Department will initiate a Request for Proposals (RFP) process to solicit bids from multiple local (within the Coachella Valley) solar array providers. The Department will work closely with the selected provider to assure cost-effective and efficient installation and operation of the solar array system at the Visitors Center. The Department will provide for ongoing management and oversight of the project, as well as routine and final inspections of all work products. The resulting solar PV system will be connected to the larger regional power grid operated by SCE.

III. PROJECT 2: INSTALLATION OF SOLAR PHOTOVOLTAIC ARRAY AT FIRE STATION #3

FUNDS REQUESTED: $311,680

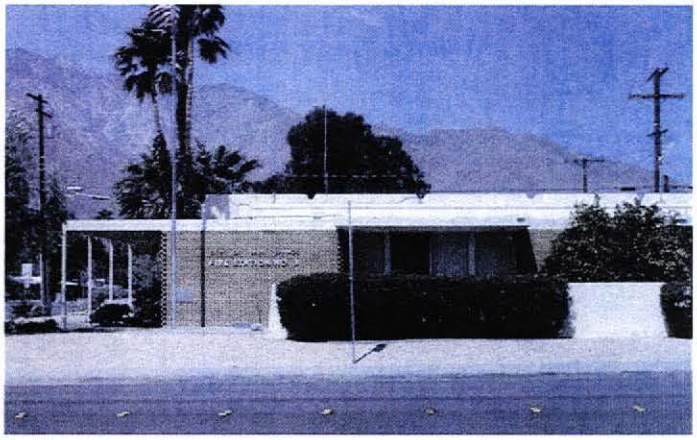
A. Summary

The City proposes to allocate $311,680 toward the administration, design, and installation of a solar PV system at Palm Springs Fire Station #3. As the project is located entirely within the established 6-mile radius of the Sentinel power plant, 100% of funding is requested from the "close proximity" funding category provided by AB1318 Mitigation Fees. Financial energy efficiency incentives from third party sources may be available for the project that could reduce overall costs from those requested. If still in place at the time the grant is awarded, these cost savings will be disclosed to AQMD staff and implemented before grant funding is provided to the City. The City will issue a Request for Proposals to solar array providers in the Coachella Valley and will work closely with the selected firm to design, install and make operational a solar array system at the Fire Station.

The installation of solar PV on the fire station will demonstrate and support the City's commitment to the use of alternative energy sources, while also reducing air emissions generated by local and regional power plants, reducing long-term energy costs, and creating local and regional jobs.

B. Project Description

Palm Springs Fire Station #3 is located at 590 E. Racquet Club, at the northwest corner of Racquet Club and Via Miraleste, in the southern portion of the designated 6-mile radius of the Sentinel power plant (please see Exhibit 1). The station's primary response area includes land east to Gene Autry Trail, south to Tachevah, north to the City limits, and west to the City limits. The building is single-story, flat-roofed, and encompasses approximately 6,254 square feet.[8] It is south-facing with an adjacent ±8-space parking lot to the immediate north.



Fire Station #3

[8] Palm Springs Building Department, May 17, 2012.

The proposed project will consist of the installation of a grid-tied, roof-top solar photovoltaic (PV) power array. The City will issue a Request for Proposals (RFP) to solicit bids from local (within the Coachella Valley) solar PV providers and award a contract. Together with its contractor, the City will determine the most effective solar PV system parameters for this particular building and site. A range of product options are available, as described in the "Technologies to be Implemented" section below.

After product selection, the system will be installed and become operational. It will operate year-round, renewing its energy supply during hours of sunlight, and is expected to produce 100% of the energy demand generate by the fire station.

1. Technologies to be Implemented

A solar PV array typically includes pre-assembled monocrystalline or polycrystalline PV modules, cabling, an inverter (to convert direct current electricity to alternating current), a connection to the broader local electricity network ("grid"), mounting equipment, and optional batteries for energy storage and backup power during power interruptions. The PV system will be interconnected to the local Southern California Edison electricity grid. Systems are designed to over-produce during daylight hours, and energy surpluses generated during the day are fed into the grid; during the evening hours, electricity "credits" are returned to the meter for cost savings.

In 2011, the fire station consumed approximately 65,998 kWh of electricity for heating, cooling, lighting, and electronics such as computers, printers, and other equipment. The proposed solar PV array is expected to provide 100% of the fire station's future annual energy demand, which is conservatively estimated to be between 68,600 and 73,300 kWh. Solar PV vendors in the Coachella Valley have provided anticipated product requirements and specifications for a system capable of providing this level of electricity. Their recommendations are provided in the table below.

Table 6
Palm Springs Fire Station #3
Solar PV System – Preliminary Product Specifications

	Total System Size*	Panels	Inverters	% of Energy Recovered
Option 1	45 KW-DC Power (STC) 38.362 KW-AC Power (CEC size)	Quantity: 180 LG Electronics Solar Cell Division Model: LG250S1C-G2, 250W Monocrystalline module	Quantity: 180 Enphase Energy Model: M215-60-2LL-S22	106%
Option 2	42.9 KW-DC Power	Quantity: 165 Schuco Solar, MPE 260 MS 08	---	102%
Option 3	46.55 kW Power	Quantity: 190 Mage 245 watt	---	---

*size needed to produce enough electricity to offset annual electricity use
--- = information not provided.
Source: preliminary estimates provided by local contractors

2. Projected Emissions Reductions

By producing 100% of the fire station's electricity demand from solar resources, the proposed PV array will eliminate the station's consumption of coal and gas-fired energy generated by local/regional power plants. Projected air emission reductions resulting from the project are shown in the table below.

Emissions reductions were estimated for this project using the Clean Air and Climate Protection (CACP) Software, Version 1.1 developed by Torrie Smith Associates, with support from the U.S. Environmental Protection Agency (EPA), for the International Council for Local Environmental Initiatives (ICLEI), State and Territorial Air Pollution Program Administrators (STAPPA), and the Association of Local Air Pollution Control Officials (ALAPCO).

To quantify emission reductions resulting from implementation of the rooftop solar at Fire Station #3, it was assumed that 65,998 kWh generated by an average electricity grid mix representative of NERC (North American Electricity Reliability Council) region 13 was replaced by 65, 998 kWh generated by "green electricity."

The following table provides the annual emissions reductions of criteria pollutants and greenhouse gases that will result from implementation of rooftop solar at the Palm Springs Fire Station #3. Output tables are also provided in Appendix B.

Table 7
Palm Springs Fire Station #3
Emission Reduction Estimates
From Proposed Solar PV Installation Project

Reductions (pounds per year)[1]					
CO2e	**CO**	**VOC**	**NOx**	**SOx**	**PM_{10}**
68,224	39	4	63	39	28

Sources: Clean Air Climate Protection Software and City data based on 2011 energy demands of Fire Station #3.
[1] Reduction estimate is from the CACP software assuming the replacement of the average electricity grid mix with "Green" electricity. Assumes PV system generates a minimum of 100% of facility energy needs.

The emission reduction estimates shown above provide the quantity of criteria pollutants and greenhouse gas emissions avoided on an annual basis from implementation of the rooftop solar system at Fire Station #3.

3. Secondary Benefits

Related to the project's air emission reductions, the local and regional population will benefit from improved air quality, which will have positive effects on the health of local residents. A reduction in criteria pollutants emissions will contribute to an incremental improvement in local and regional public health.

A rooftop system will increase the roof life of the Fire Station, by protecting the roof from direct sun exposure. In addition, the PV system could reduce the heating and cooling load of Fire Station #3, since the PV system will shade the roof, thereby cooling it down and reducing the maximum surface temperature.

The proposed project will generate electricity without producing noise or hazardous waste. The project will also contribute to an incremental reduction in the region's consumption of, and reliance on fossil fuels.

The electrical power grid in the upper Coachella Valley, which is operated by Southern California Edison (SCE), is currently overloaded beyond its capacity, and SCE is reconfiguring the system in response. The proposed solar array project will eliminate the fire station's net demand for local electricity supplies and contribute to a solution to an overloaded system.

Utilization of the proposed solar PV system will result in direct cost savings to the City. In 2011, the annual energy demand for the station was 65,998 kWh for heating and cooling, lighting, and electronics, such as computers, printers, and other equipment, with an associated per kWh cost of $0.17. It is expected that 100% of the energy demand generated by Fire Station #3 will be met by the proposed PV system, representing a savings of $10,890 to the City annually. These monies

previously used to pay for utility bills will be available for other programs and expenses in a time when City revenues are limited, and programs have been reduced or eliminated.

4. Estimated Job Creation

Solar energy can be an effective economic development driver as it employs a wide range of workers, many of which are skilled and/or high-tech positions requiring advanced education, training, or certification.

Direct Employment

It is anticipated that construction of the Fire Station's solar array will result in the direct employment of 6 solar vendor employees, including 2 solar design engineers for project design, planning and supervision, and 4 PV system installers. Since the City is committed to selecting a local Coachella Valley vendor, it is expected that all 6 solar vendor personnel will be local residents. Project administration and oversight will also require the time and skills of 4 City employees in the Public Works Department who are local Coachella Valley residents.

Indirect Employment

Although not quantifiable, project build out will also indirectly contribute to the employment of other individuals in the solar technology industry. The project will increase the demand for solar panels, associated hardware, and ongoing maintenance services, thereby providing work opportunities for equipment engineers and assemblers, truck drivers and construction equipment operators, and roofers and mechanical technicians. While some of these individuals, such as roofers and service technicians, may live locally, it is likely that others such as assemblers live outside the region.

Economic Multipliers

Build out of the Fire Station solar array will not only generate project-related jobs, but will also result in a spending "multiplier effect" in the community and region. The economic multiplier effect occurs when a worker's disposable income is spent on local goods and services, such as food, housing, and clothing, and then "trickles down" throughout the economy.

Economic analysis often considers a multiplier of 2.5 in assessing the potential benefits associated with indirect expenditures; that is to say that every dollar spent results in actual spending of $2.50 because of the "domino" effect of additional revenue. Average rates for solar engineers/designers in the Coachella Valley are $89/hour, and it is anticipated that project design will require a total of 265 hours of engineering time. This equates to $23,585 in engineering salaries. Hourly wages for solar installers in the Coachella Valley are $40/hour. It is anticipated that a total of 480 hours will be needed for installation of the Fire Station solar array, resulting in payment of $19,200 to solar installers. Total payments to solar vendors, therefore, are estimated at $42,785. If 20% of these salaries, or $8,557, is expendable income spent on goods and

services throughout the Coachella Valley, a multiplier of 2.5 means that $21,393 will be recycled through the local and regional economies.

Increased spending and demand for services and goods could also translate into more local jobs. Based on an analysis of economic data for the Coachella Valley, the region's base employment multiplier is 1.7.[9] This means that for every new job created in the region, 0.7 additional jobs will be generated indirectly as "new" money is spent in the economy. As the Fire Station solar project is expected to directly employ 6 solar vendor personnel, this could translate into the creation of 4.2 new jobs in the community.

C. Statement of Work

To complete the proposed project, the City Public Works Department will initiate a Request for Proposals (RFP) process to solicit bids from multiple local (within the Coachella Valley) solar array providers. The Department will work closely with the selected provider to assure cost-effective and efficient design, installation and operation of the solar array system at the Fire Station. Public Works will provide ongoing management and oversight of the project, as well as routine and final inspections of all work products. The resulting solar PV system will be connected to the larger regional power grid operated by Southern California Edison.

[9] "Coachella Valley Economic Blueprint," prepared by Market Street Services, Inc. for Coachella Valley Economic Partnership, 2008.

IV. PROJECT 3: INSTALLATION OF SOLAR PHOTOVOLTAIC ARRAY AT THE PALM SPRINGS TRAIN STATION

FUNDS REQUESTED: $190,365

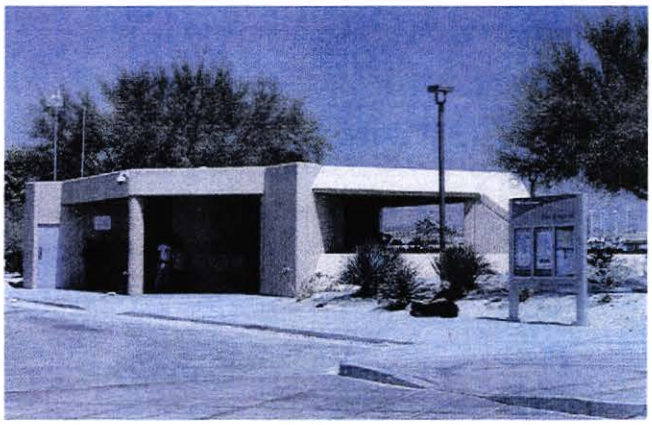
A. Summary

The City is seeking $190,365 of AB1318 Mitigation Fee funds for the design, installation, and administration of solar photovoltaic (PV) arrays at the Palm Springs Train Station. The station is located approximately three (3) miles southeast of the Sentinel power plant, and the City is requesting 100% funding from the "close proximity" fund category. Financial energy efficiency incentives from third party sources may be available for the project that could reduce overall costs from those requested. If still in place at the time the grant is awarded, these cost savings will be disclosed to AQMD staff and implemented before grant funding is provided to the City.

The project will involve the City issuing a Request for Proposals from local and regional solar array vendors, and selecting and working closely with the subconsultant to install and make operational a solar array at the Palm Springs Train Station parking lot.

B. Project Description

The Palm Springs Train Station is located at 63950 Palm Springs Station Road, just west of Indian Avenue and south of I-10 and Garnet Avenue (please see Exhibit 1). The station serves Amtrak passenger trains and Greyhound buses and consists of an open-air platform and covered structure of approximately 2,160 square feet.[10] To the immediate south is an adjacent parking lot with ±40 parking spaces and an additional ±6 parking spaces for oversized vehicles, such as campers and RVs. To the immediate north are northwest-southeast trending railroad tracks.



Palm Springs Train Station

The City will select a local (within the Coachella Valley) solar PV system provider using its RFP process. Together with its consultant, the City will determine appropriate system parameters and

[10] Palm Springs Building Department, May 17, 2012.

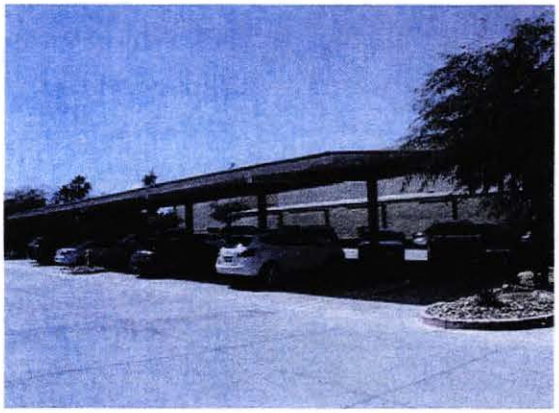
Train Station Parking Lot

products needed to optimize on-site solar power generation. Due to the covered structure's limited size and roofing supports, multiple elevated, steel carport-like structures will be built in the parking lot, and 100% of the solar panels will be mounted atop these structures. Please refer to the photos below for examples of parking lot solar mounts found elsewhere in the Coachella Valley. Once the system is installed and operational, it is expected to provide 100% of the station's energy demands.

1. Technologies to be Implemented

A typical solar PV array consists of pre-assembled PV modules (monocrystalline or polycrystalline), module cabling (on the direct current side), an inverter which converts direct current (DC) electricity to alternating current (AC) electricity, a connection to the electricity network (on the alternating current side), mounting equipment, and optional batteries for energy storage or backup power in case of power interruptions. The PV system will be interconnected to the local Southern California Edison electricity grid. Systems are designed to over-produce during daylight hours, and energy surpluses generated during the day are fed into the grid; during the evening hours, electricity "credits" are returned to the meter for cost savings.

In 2011, the annual energy demand of the train station was 39,122 kwh, generated by outdoor lighting of the parking lot and passenger platform. To provide for a conservative analysis, it is



Examples of Parking Lot Solar Panel Mounts

assumed that future energy consumption at the station will be approximately 43,000 kwh annually, and the proposed solar array will be designed with a capacity to meet this demand.

Solar providers in the Coachella Valley were contacted to estimate preliminary system requirements for the proposed project. The information received is summarized in the table below. Each system will be capable of generating approximately 43,000 kwh annually, as mentioned above.

Table 10
Palm Springs Train Station
Solar PV System – Preliminary Product Specifications

	Total System Size*	Panels	Inverters	% of Energy Recovered
Option 1	27 KW-DC Power (STC) 23.017 KW-AC Power (CEC size)	Quantity: 108 LG Electronics Solar Cell Division Model: LG250S1C-G2, 250W Monocrystalline module	Quantity: 108 Enphase Energy Model: M215-60-2LL-S22	106%
Option 2	27.3 KW-DC Power	Quantity: 105 Schuco Solar, MPE 260 MS 08	---	106%
Option 3	29.89 kW Power	Quantity: 122 Mage 245 watt	---	---

*size needed to produce enough electricity to offset annual electricity use
--- = information not provided.
Source: preliminary estimates provided by local contractors

2. Projected Emissions Reductions

The proposed project is expected to provide 100% of the train station's energy requirements and, therefore, will eliminate the consumption of coal, gas, and other non-renewable fossil fuels generated by local and/or regional power plants for this site. This will translate into associated air emission reductions.

Emission reductions were estimated for this project using the Clean Air and Climate Protection (CACP) Software, Version 1.1 developed by Torrie Smith Associates, with support from the U.S. Environmental Protection Agency (EPA), for the International Council for Local Environmental Initiatives (ICLEI), State and Territorial Air Pollution Program Administrators (STAPPA), and the Association of Local Air Pollution Control Officers (ALAPCO).

To quantify emission reductions resulting from implementation of the solar covered parking at the train station, it was assumed that 43,000 kWh generated by an average electricity grid mix

representative of NERC (North American Electricity Reliability Council) region 13 was replaced by 43,000 kWh generated by "green electricity."

The following table provides the annual emissions reduction of criteria pollutants and greenhouse gases that will result from implementation of solar over top parking at the Palm Springs Train Station. Output tables are also provided in Appendix B.

Table 11
Palm Springs Train Station
Emission Reduction Estimates
From Proposed Solar PV Installation Project

Reductions (pounds per year)[1]					
CO2e	**CO**	**VOC**	**NOx**	**SOx**	**PM_{10}**
44,451	25	3	41	25	18

Sources: Clean Air Climate Protection Software and City data based on 2011 energy demands of train station.
[1] Reduction is from the CACP software assuming the replacement of the average electricity grid mix with "Green" electricity. Assumes PV system generates a minimum of 100% of facility energy needs.

3. Secondary Benefits

Use of the proposed solar PV array at the Train Station will reduce the amount of electric power demanded from local and/or regional power plants. Although this reduction is arguably limited in scale due to the small size of the facility, it nonetheless represents an incremental contribution to local and regional reductions in the use of and reliance on coal, gas, and other non-renewable resources. More specifically, the use of solar power at this site will ease the pressure currently experienced by SCE's upper Coachella Valley power grid, which is overloaded beyond its capacity and being reconfigured.[11]

The conversion to solar power will also contribute to health benefits for the local and regional population. Above-parking solar could reduce heat temperatures of the parking lot, thereby reducing the heat island effect, and provide shaded parking, which could reduce the amount of coolant needed to achieve desirable temperatures inside vehicles.

Utilization of the proposed solar PV system at the Train Station will result in direct cost savings to the City. In 2011, the annual energy demand of the train station was 39,122 kwh, generated by outdoor lighting for the station and parking lot. As mentioned, it is assumed that 43,000 kWh will be generated by the proposed PV system, which represents an annual savings of $6,493 to the City. These funds will be available for other City programs and projects.

In addition, PV installation can be expected to increase the value of the train station property.

[11] http://www.sce.com/PowerandEnvronment/Transmission/ProjectsbyCounty/RiversideCounty/DeversMirage/default.htm, accessed April 23, 2012.

4. Estimated Job Creation

Solar energy can be an effective economic development driver as it employs a wide range of workers, many of which are skilled and/or high-tech positions requiring advanced education, training, or certification.

Direct Employment

It is anticipated that construction of the Train Station solar array will result in the direct employment of 4 solar vendor employees, including 2 solar engineering consultants for project design, planning and supervision, and 2 PV system installers. Since the City is committed to selecting a local Coachella Valley vendor, it is expected that all 4 solar vendor personnel will be local residents. Project administration and oversight will also require the time and skills of 4 City employees in the Public Works Department who are local Coachella Valley residents.

Indirect Employment

Although not quantifiable, project buildout will also indirectly contribute to the employment of other individuals in the solar technology industry. The project will increase the demand for solar panels, associated hardware, and ongoing maintenance services, thereby providing work opportunities for equipment engineers and assemblers, truck drivers and construction equipment operators, and roofers and mechanical technicians. While some of these individuals, such as roofers and service technicians, may live locally, it is likely that others such as assemblers live outside the region.

Economic Multipliers

Buildout of the Train Station solar array will not only generate project-related jobs, but will also result in a spending "multiplier effect" in the community and region. The economic multiplier effect occurs when a worker's disposable income is spent on local goods and services, such as food, housing, and clothing, and then "trickles down" throughout the economy.

Economic analysis often considers a multiplier of 2.5 in assessing the potential benefits associated with indirect expenditures; that is to say that every dollar spent results in actual spending of $2.50 because of the "domino" effect of additional revenue. Average rates for solar engineers/designers in the Coachella Valley are $89/hour, and it is anticipated that project design will require a total of 150 hours of engineering time. This equates to $13,350 in engineering salaries. Hourly wages for solar installers in the Coachella Valley are $40/hour. It is anticipated that a total of 240 hours will be needed for installation of the Train Station solar array, resulting in payment of $9,600 to solar installers. Total payments to solar vendors, therefore, are estimated at $22,950. If 20% of these salaries, or $4,590, is expendable income spent on goods and services throughout the Coachella Valley, a multiplier of 2.5 means that $11,475 will be recycled through the local and regional economies.

Increased spending and demand for services and goods could also translate into more local jobs. Based on an analysis of economic data for the Coachella Valley, the region's base employment multiplier is 1.7.[12] This means that for every new job created in the region, 0.7 additional jobs will be generated indirectly as "new" money is spent in the economy. As the Train Station solar project is expected to directly employ 4 solar vendor personnel, this could translate into the creation of 2.8 new jobs in the community.

C. Statement of Work

To complete the proposed project, the City Public Works Department shall initiate a Request for Proposals (RFP) process to solicit bids from multiple local (within the Coachella Valley) solar array providers. The Department shall work closely with the selected provider to assure cost-effective and efficient installation and operation of the solar array system at the Train Station. Public Works shall provide ongoing management and oversight of the project, as well as routine and final inspections of all work products. The resulting solar PV system shall be connected to the larger regional power grid operated by Southern California Edison.

[12] "Coachella Valley Economic Blueprint," prepared by Market Street Services, Inc. for Coachella Valley Economic Partnership, 2008.

V. PROJECT 4: INSTALLATION OF SOLAR PHOTOVOLTAIC ARRAY AT THE JAMES O. JESSIE DESERT HIGHLAND UNITY CENTER

FUNDS REQUESTED - $388,265

A. Summary

The City is seeking $388,265 in AB1318 Mitigation Fee funding for design, installation, and administration of a solar photovoltaic (PV) array at the James O. Jessie Desert Highland Unity Center. Because of its location within the six-mile radius of the Sentinel power plant, 100% of funds are being requested from the "close proximity" funding category. Financial energy efficiency incentives from third party sources may be available for the project that could reduce overall costs from those requested. If still in place at the time the grant is awarded, these cost savings will be disclosed to AQMD staff and implemented before grant funding is provided to the City.

The City will issue a Request for Proposals from a variety of local solar array vendors and will work closely with the selected firm to install and make operational solar panels at the Desert Highland Unity Center.

B. Project Description

The James O. Jessie Desert Highland Unity Center is located at 480 Tramview Road. The 12,844 square foot, City-owned complex is managed by the City's Parks and Recreation Department. The Unity Center has been providing valuable community services to residents of northern Palm Springs since 1976 and plays a vital role in the social and economic lives of many families living in the 6-mile radius of the Sentinel plant. The center serves hundreds of individuals weekly, and management indicates that 99% of participants are low- to moderate-income residents.[13] A wide range of community programs and special events are offered at the Center, including early childhood literacy and adult computer education classes, kids' clubs, sporting events, holiday parties, and seasonal carnivals. The site also offers numerous support

Desert Highland Unity Center

[13] Jarvis Crawford, Community Center Manager, May 17, 2012.

programs for disadvantaged children and families, including holiday toy give-aways, student backpack give-aways, and a summer free lunch program for youth which is administered in partnership with the Palm Springs Unified School District.

Desert Highland Unity Center

The Center is designated as one of 22 county-wide "Cool Centers" through Riverside County's Community Action Partnership. When a heat warning is issued by the County Health Department, the Center serves as a drop-in site for the public, particularly vulnerable individuals such as the elderly and disabled, who are in need of relief from the heat.

The proposed project consists of the installation of a grid-tied, roof-top solar photovoltaic (PV) power array. The City will issue a Request for Proposals (RFP) to solicit bids from local (within the Coachella Valley) solar PV providers and award a contract. Together with its contractor, the City will determine the most effective solar PV system parameters for this particular building and site. A range of product options are available, as described in the "Technologies to be Implemented" section below

In 2010, renovations were made to the facility to improve its energy-efficiency and sustainability, including the installation of low-flow toilets, energy-efficient air conditioning units, rooftop evaporative coolers, T-8 lighting, and Energy Star kitchen appliances. Additional improvements included the installation of ADA-compliant play equipment and mural restoration. The $200,000 improvements were funded by a combination of sources, including a U.S. Department of Housing and Urban Development Block Grant and funds provided by the Palm Springs Public Arts Commission, Measure Y, and the Agua Caliente Band of Cahuilla Indians Charitable Grant Program. The grant funding sought through this grant request will continue to expand on the energy efficiency measures initiated by those programs.

1. Technologies to be Implemented

A typical solar PV array consists of pre-assembled PV modules (monocrystalline or polycrystalline), module cabling (on the direct current side), an inverter which converts direct current (DC) electricity to alternating current (AC) electricity, a connection to the broader electricity network ("grid"), mounting equipment, and optional batteries for energy storage or backup power in case of power interruptions. The PV system will be interconnected to the local Southern California Edison electricity grid. Systems are designed to over-produce during daylight hours, and energy surpluses generated during the day are fed into the grid; during the evening hours, electricity "credits" are returned to the meter for cost savings.

In 2011, the Desert Highland Unity Center consumed approximately 85,320 kWh of electricity for heating, cooling, lighting, and electronics such as computers, printers, and other equipment. The proposed solar PV array is expected to provide 100% of the facility's future annual energy demand. Solar PV vendors in the Coachella Valley have provided anticipated product requirements and specifications for a system capable of providing this level of electricity. Their recommendations are provided in the table below.

Table 14
Desert Highland Unity Center
Solar PV System – Preliminary Product Specifications

	Total System Size*	Panels	Inverters	% of Energy Recovered
Option 1	56 KW-DC Power (STC) 47.739 KW-AC Power (CEC size)	Quantity: 224 LG Electronics Solar Cell Division Model: LG250S1C-G2, 250W Monocrystalline module	Quantity: 224 Enphase Energy Model: M215-60-2LL-S22	106%
Option 2	44.6 KW-DC Power	Quantity: 210 Schuco Solar, MPE 260 MS 08	---	102%
Option 3	60.27 kW Power	Quantity: 246 Mage 245 watt	---	---

*size needed to produce enough electricity to offset annual electricity use
--- = information not provided.
Source: preliminary estimates provided by local contractors

2. Projected Emissions Reductions

By producing a minimum of 100% of the Unity Center's electricity demand from solar resources, the proposed PV array will eliminate its consumption of coal and gas-fired energy generated by local/regional power plants.

Emission reductions were estimated for this project using the Clean Air and Climate Protection (CACP) Software, Version 1.1 developed by Torrie Smith Associates, with support from the U.S. Environmental Protection Agency (EPA), for the International Council for Local Environmental Initiatives (ICLEI), State and Territorial Air Pollution Program Administrators (STAPPA), and the Association of Local Air Pollution Control Officers (ALAPCO).

To quantify emission reductions resulting from implementation of the rooftop solar at the Desert Highland Unity Center, it was assumed that 85,320 kWh generated by an average electricity grid mix representative of NERC (North American Electricity Reliability Council) region 13 was replaced by 85,320 kWh generated by "green electricity."

The following table provides the annual emissions reduction of criteria pollutants and greenhouse gases that will result from implementation of solar panels at the Unity Center. Output tables are also provided in Appendix B.

Table 15
Desert Highland Unity Center
Emission Reduction Estimates
From Proposed Solar PV Installation Project

Reductions (pounds per year)[1]					
CO2e	CO	VOC	NOx	SOx	PM_{10}
88,198	51	6	81	50	36

Sources: Clean Air Climate Protection Software and City data based on 2011 energy demands of Unity Center.
[1] Reduction is from the CACP software assuming the replacement of the average electricity grid mix with "Green" electricity. Assumes PV system generates a minimum of 100% of facility energy needs.

3. Secondary Benefits

The Desert Highland Unity Center is designated through the Riverside County Community Action Partnership as one of 22 county-wide "Cool Centers" for public use during extreme summer heat conditions. As such, it can be expected to rely heavily on air-conditioning, fans, and other cooling equipment to support hundreds of residents during the summer months. Use of the proposed solar PV array at the Center will reduce the amount of electric power demanded from local and/or regional power plants, particularly during heavily used summer months, and will help the facility fulfill its critical public health and safety responsibilities during these times. This reduction represents an incremental contribution to local and regional reductions in the use of and reliance on coal, gas, and other non-renewable resources. More specifically, the use of solar power at this site will ease the pressure currently experienced by SCE's upper Coachella Valley power grid, which is overloaded beyond its capacity and being reconfigured.[14]

[14] http://www.sce.com/PowerandEnvronment/Transmission/ProjectsbyCounty/RiversideCounty/DeversMirage/default.htm, accessed April 23, 2012.

A reduction in criteria pollutants emissions will contribute to an incremental improvement in local and regional public health. A rooftop system could potentially increase the roof life by protecting the roof from direct sun exposure. In addition, the PV system will shade the roof, thereby cooling it down and reducing the maximum surface temperature.

Installation and utilization of the proposed PV system at the Desert Highland Unity Center will result in direct cost savings to the City. In 2011, the annual energy demand for the Center was 85,320 kWh for heating and cooling, lighting, and electronics, such as computers, printers, and other equipment. The proposed PV system would recover ±100% of the energy demand generated by the Center, representing an annual savings of $14,419 to the City. These dollars will be available for other public programs and improvements. Installation of the PV system is also expected to increase the value of the property.

4. Estimated Job Creation

Solar energy can be an effective economic development driver as it employs a wide range of workers, many of which are skilled and/or high-tech positions requiring advanced education, training, or certification.

Direct Employment

It is anticipated that construction of the Desert Highland Unity Center solar array will result in the direct employment of 6 solar vendor employees, including 2 solar engineering consultants for project design, planning and supervision, and 4 PV system installers. Since the City is committed to selecting a local Coachella Valley vendor, it is expected that all 6 solar vendor employees will be local residents. Project administration and oversight will also require the time and skills of 4 City employees in the Public Works Department who are local Coachella Valley residents.

Indirect Employment

Although not quantifiable, project buildout will also indirectly contribute to the employment of other individuals in the solar technology industry. The project will increase the demand for solar panels, associated hardware, and ongoing maintenance services, thereby providing work opportunities for equipment engineers and assemblers, truck drivers and construction equipment operators, and roofers and mechanical technicians. While some of these individuals, such as roofers and service technicians, may live locally, it is likely that others such as assemblers live outside the region.

Economic Multipliers

Buildout of the Unity Center's solar array will not only generate project-related jobs, but will also result in a spending "multiplier effect" in the community and region. The economic multiplier effect occurs when a worker's disposable income is spent on local goods and services, such as food, housing, and clothing, and then "trickles down" throughout the economy.

Economic analysis often considers a multiplier of 2.5 in assessing the potential benefits associated with indirect expenditures; that is to say that every dollar spent results in actual spending of $2.50 because of the "domino" effect of additional revenue. Average rates for solar engineers/designers in the Coachella Valley are $89/hour, and it is anticipated that project design will require a total of 350 hours of engineering time. This equates to $31,350 in engineering salaries. Hourly wages for solar installers in the Coachella Valley are $40/hour. It is anticipated that a total of 480 hours will be needed for installation of the Unity Center solar array, resulting in payment of $19,200 to solar installers. Total payments to solar vendors, therefore, are estimated at $50,550. If 20% of these salaries, or $10,110, is expendable income spent on goods and services throughout the Coachella Valley, a multiplier of 2.5 means that $25,275 will be recycled through the local and regional economies.

Increased spending and demand for services and goods could also translate into more local jobs. Based on an analysis of economic data for the Coachella Valley, the region's base employment multiplier is 1.7.[15] This means that for every new job created in the region, 0.7 additional jobs will be generated indirectly as "new" money is spent in the economy. As the Unity Center solar project is expected to directly employ 6 solar vendor personnel, this could translate into the creation of 4.2 new jobs in the community.

C. Statement of Work

To complete the proposed project, the City Public Works Department will initiate a Request for Proposals (RFP) process to solicit bids from multiple local and regional (within the Coachella Valley) solar array providers. The Department will work closely with the selected provider to assure cost-effective and efficient installation and operation of the solar array system at the Desert Highland Unity Center. Public Works will provide ongoing management and oversight of the project, as well as routine and final inspections of all work products. The resulting solar PV system will be connected to the larger regional power grid operated by SCE.

[15] "Coachella Valley Economic Blueprint," prepared by Market Street Services, Inc. for Coachella Valley Economic Partnership, 2008.