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WATER AND POWER

September 30, 2025

Ashley Gutierrez
Compliance Project Manager
California Energy Commission
Siting, Transmission, and Environmental Protection Division (STEP)
Safety and Reliability Branch
Compliance Monitoring and Enforcement Unit
715 P Street, MS-2000, Sacramento, CA 95814

Subject: Additional Information for Petition To Amend Docket # 01-AFC-06C TN 260806

Ms. Gutierrez,

Burbank Water and Power (BWP) would like to provide the following additional information relating to the *Magnolia Power Plant Petition to Amend Advanced Gas Path Compressor Upgrade Project* (PTA) Docket #01-AFC-06C TN 260806. There is a difference in the mentioned megawatt (MW) increase among several of the related documents. The South Coast Air Quality Management District (SCAQMD) Title V air permit amendment and California Energy Commission (CEC) PTA have listed an increase of 32 MW in generation capacity. This is lower than the increase in generation capacity provided in the CEC DEBA grant applications. This difference is because the SCAQMD and CEC PTA calculations are at 22 degrees Fahrenheit (F).The pollutant emissions were calculated at 22 degrees F to perform a conservative emission and air quality impact analysis. The reason the upgrade output is less in these documents than the CEC DEBA grant applications is because at 22 degrees F, the combined cycle output without the upgrades is a much higher number due to the increased ambient air density. For example, current combined cycle output at 22 degrees F is closer to 291 MW vs the 247.7 MW at 77 degrees. Due to electric system capacity limitations, the generation facility cannot utilize 53.9 MW of generation capacity upgrade at 22 degrees F because it would make generation capacity around 345 MW and the associated

electric system is only designed for 323 MW. This is not a concern in this case because electric demand is lower in the winter and the intent of the proposed grant upgrades is mainly to increase summer capacity. After the proposed upgrades are installed, in conditions of 22 degrees F or similar where the plant could generate more than 323 MW, output would be restricted to 323 MW. At higher ambient temperatures, the output would be unrestricted. Restrictions will be made by the use of existing distributed control systems within the generation facility including General Electric Mark VI and Emerson Delta V software that is used to control turbine and generator output. Generation equipment will be tuned to maximize output in the summer as the winter electric demand is lower. In addition, a maximum generation limit of 323 MW will be incorporated into the distributed control systems.

Below is a table provided by General Electric Vernova that indicates expected performance of the Advanced Gas Path (AGP) which is listed as AGP Tech Only and the combination of both the Advanced Gas Path and Advanced Compressor upgrades which are listed as 7F.04-200. At 77 degrees F, the combined-cycle generation facility can currently generate 247.4 MW. The AGP adds 24.02 MW and Advanced Compressor adds another 29.91 MW at 77 degrees F, for a total increase of 53.93 MW. Below 77 degrees F, the generation output increase would be higher and eventually be limited to the electrical system capacity of 323 MW. This condition is only expected at very low temperatures, some of which are not actual conditions for this generation site. The coldest average annual temperature for Burbank California over the past 100 years is around 44 degrees F. Other reference points included in the table are 90 degrees F, 100 degrees F, and 113 degrees F.

Current Configuration - Baseload				
Ambient Temp	**77**	**90**	**100**	**113**
CC Gross Output MWs	247.4	236.3	227.9	216.6
AGP Tech only - Baseload				
Ambient Temp	**77**	**90**	**100**	**113**
CC Gross Output Delta %	9.7%	9.2%	7.3%	1.3%
CC Gross Output MW Improvement	24.02	21.82	16.61	2.83
7F.04-200 - Baseload				
Ambient Temp	**77**	**90**	**100**	**113**
CC Gross Output Delta %	21.8%	24.8%	23.3%	19.5%
CC Gross Output MW Improvement	53.93	58.66	53.02	42.32

The following references are enclosed:

Reference 1: Magnolia Power Project - Advanced Compressor System Upgrade CEC questionnaire and related attachments
Reference 2: Magnolia Power Project - Advanced Gas Path System Upgrade CEC questionnaire and related attachments

Thank You,

Frank Messineo
Power Production Manager
Burbank Water and Power

Enclosures (2)

Reference 1:

Magnolia Power Project - Advanced Compressor System Upgrade CEC questionnaire and related attachments

CALIFORNIA ENERGY COMMISSION

CALIFORNIA NATURAL RESOURCES AGENCY

Rev 07/07/2022

POST CERTIFICATION PROJECT CHANGE QUESTIONNAIRE

Project Name	Magnolia Power Project (Advanced Compressor Resiliency Upgrade)	Docket #	01-AFC-6C
Contact Name	Claudia Reyes	Date	5/20/2024
Contact Phone Number	818-331-7836		

1. Please provide a detailed description of the proposed change(s). Please note if the work will be conducted during regularly scheduled maintenance or if a special shut down of the operation is required. Whenever possible please support your request with preliminary engineering drawings/plans, including materials list, type, size quantity, cut sheets, MSDS sheets, photographs, sketches, etc. Also include anticipated schedule and commencement date, work duration, and expected number of employees. Describe why the project change is needed (e.g., due to changes in regulation or operation and maintenance specifications, equipment, or component failure).

   Burbank Water and Power (BWP) is the project applicant and operating agent for the Magnolia Power Plant (MPP), which serves members of the Southern California Public Power Authority (SCPPA). MPP provides energy to the cities of Anaheim, Burbank, Cerritos, Colton, Glendale, and Burbank.

   BWP proposes to design, engineer, deploy, and operate a new, advanced compressor system upgrade to its existing MPP, sufficient to increase the facility's effective power output by up to 29.9 MW / 233,346 MWh/yr for resiliency and resource adequacy improvements. The resulting targeted upgrades will provide increased power supply to support local communities and residents within the region.

   The MPP is an existing, combined cycle, natural gas fired power generation facility, with a current output capacity of 247.4 MW at full load. Under the project, BWP seeks to upgrade the existing gas turbine portion of the MPP to support an increase in power production. BWP proposes to upgrade its existing gas turbine with an advanced compressor system, sufficient to increase system efficiency and drive increased power production while full load energy consumption.

   The proposed upgrades will include an upgrade to an advanced compressor (e.g., GE 7F.04 -200), including retrofitting of a 7FA.05 compressor—GE's most advanced high efficiency compressor technology—along with a Gen-V turbine rotor, into MPP's gas turbine system, resulting in significant improvements to output and heat rate, as well as reliability and maintainability enhancements. The proposed compressor is composed of 14 stages, configured so as to increase flow rate, while accommodating inlet conditioning with improved leading edge erosion tolerance.

   The compressor's first three stages will include variable stator vanes to provide a wider operating envelope while enhancing hot-day and partial-load system efficiency. System related maintenance improvements include an upgraded bolted steel construction, along with rotor blade and wheel design that allows their removal without pulling the rotor from its casing. The system will also include an advanced Blade Health Monitoring (BHM) system for stages 1 through 3 rotor blades, along with additional borescope holes in the compressor to simplify system inspections.

   Collectively, these upgrades will support the following system improvements: Increased base load output & efficiency, improved part load efficiency, field replaceable compressor rotor blades, improved hot day performance and increase exhaust available energy to bottoming cycle for increased steam turbine output for combined cycle applications.

If the project activities begin on June, 2024, all project activities would be complete no later than June, 2027.

Please refer to the attached GFO-23-401 grant application documentation for additional information regarding project description and schedule.

1) Burbank Project Narrative
2) Burbank Scope of Work

This work does not align with existing outages due to component lead times. A special outage would be required in 2027 to install the upgrade. One approximately 95-day outage is required for both the Advanced Gas Path and sister project Advanced Compressor.

2. Would the proposed modification alter the project design, operation, or performance requirements as described in the project's Final Commission Decision (Decision) (e.g., project description) or as described in any subsequent amendments or any documents incorporated by reference (e.g., Application for Certification (AFC), AFC Supplements, Final Staff Assessment, etc.)? ☒ Yes ☐ No

   The proposed modification would upgrade its existing gas turbine with an advanced compressor system.

3. Would the proposed project change cause a direct physical change or reasonably foreseeable indirect physical change to the site or equipment on site? If yes, please explain. ☒ Yes ☐ No

   The proposed project would result in changes to equipment onsite, specifically replacement of combustion turbine compressor with an upgraded compressor. This is internal to the existing combustion turbine compartment and there would be no noticeable external changes.

   a. Is the proposed project change to software? ☐ Yes ☒ No
   b. Is there a change to method of operation or how the facility is being operated? If NO, please explain. ☐ Yes ☒ No

   The facility's method of operation will not change.

4. Would the proposed change result in change to, or deletion of, a condition of certification adopted by the commission in the Decision or subsequent amendments? If YES, please provide detailed description: ☒ Yes ☐ No

   Yes, the COC Air Quality section will need to be modified to include updated SCAQMD Title V permit conditions. CEC staff will confirm if other sections need to be updated.

5. Are there any additional permits from other agencies required? If YES, which permits/agencies, have you already filed a permit application, and what is the proposed timing for these permits? ☒ Yes ☐ No

This project will require a South Coast Air Quality Management District Title V permit modification. Based on previous permit application submittals, the anticipated schedule is as follows:

Permit Application Submittal – July 2024
Permit Review 8 – 15 months- March 2025- October 2025

FOR INTERNAL USE ONLY

Please provide your response to the Compliance Project Manager by Click or tap to enter a date.

Office	Initials	Date	PTA or NPTA	DCBO Required?	On Call or RFQ Contract
CME Supervisor					
S&R Branch Manager					
Engineering Branch Manager					
Siting Branch Manager					
Transmission Supervisor					
CCO					

ATTACHMENT 2
Project Narrative Form

City of Burbank Magnolia Power Project: Advanced Compressor Resiliency Upgrade

Burbank Water and Power

City of Burbank, California

February 20, 2024

ATTACHMENT 2
Project Narrative Form

Table of Contents

ATTACHMENT 2
Project Narrative Form

0.0 PROJECT SUMMARY AND PROJECT DESCRIPTION

0.1 Project Summary

Burbank Water and Power (BWP) proposes to design, engineer, deploy, and operate a new, advanced compressor system upgrade to its existing Magnolia Power Plant (MPP), sufficient to increase the facility's effective power output by up to 29.9 MW / 233,346 MWh/yr for resiliency and resource adequacy improvements. Power generated by the system will be made available for multiple uses during normal operating hours, including during peak and high peak periods. For example, the project will provide up to its full capacity during peak demand periods (e.g., 4pm to 10pm), equivalent to up to 179.6 MWh/d of new peak power production.

BWP is the project applicant and operating agent for the MPP, which ultimately serves members of the Southern California Public Power Authority (SCPPA). Herein, MPP provides energy to the cities of Anaheim, Burbank, Cerritos, Colton, Glendale, and Burbank. The resulting targeted upgrades will provide increased power supply to support local communities and residents within the region. The additional power delivered by the facility will help to reduce reliance on more inefficient forms of generation, thereby resulting in a net reduction in GHG and criteria air pollutant emissions during peak power production periods, for power offset by the upgraded facility. Moreover, the project will also alleviate local transmission bottlenecks, and help ensure that potential for brownout and blackout conditions are substantially reduced, especially when the state's grid is under high demand / high strain conditions. It will also provide more inertia, which is required for electric system reliability and needed as more renewable energy resources are brought online.

The project will also support multiple benefits to local communities, including reduced upward pressures on rates in comparison to bringing online additional power generation via a new peak power production plant or other greenfield facility, or upgrading / replacing ageing transmission and distribution (T&D) infrastructure. Moreover, the project will result in a reduction of 38,072 metric tonnes of carbon dioxide equivalent emissions per year (MT CO2e/yr) in greenhouse gas (GHG) emissions, along with associated reductions in nitrogen oxides (NOx) and carbon monoxide (CO) due to a significant improvement in efficiency in comparison to peak power supplies that the project would offset.

0.2 Project Description

The MPP is an existing, combined cycle, natural gas fired power generation facility, with a current output capacity of 247.4 MW at full load.[1] Under the project, BWP seeks to upgrade the existing gas turbine portion of the MPP to support an increase in power production. BWP has already initiated early-phase coordination with GE Vernova (GE), the manufacturer of the MPP's existing gas turbine system, regarding potential upgrades to its system to increase energy efficiency and output capacity.

MPP Configuration	Full Load Output
Existing	247.4 MW
With Project (Advanced Compressor)	277.3 MW
Project Benefit	29.9 MW increase

Table 1. Project capacity improvements

[1] Note that the MPP's nameplate capacity is higher than its actual output, due to a higher historic system capacity (a portion of the MPP's generation capacity was previously removed, lowering the facility's output) and because the system is only capable of reaching or approaching its nameplate output during very low ambient temperatures.

To this end, GE has suggested two potential system upgrades, which could be installed individually or in tandem (Figure 1). Under this proposal, BWP proposes to upgrade its existing gas turbine with an advanced compressor system, sufficient to increase system efficiency and drive increased power production, while full load energy consumption Table 1 summarizes the technical outcomes of the proposed compressor replacement project.

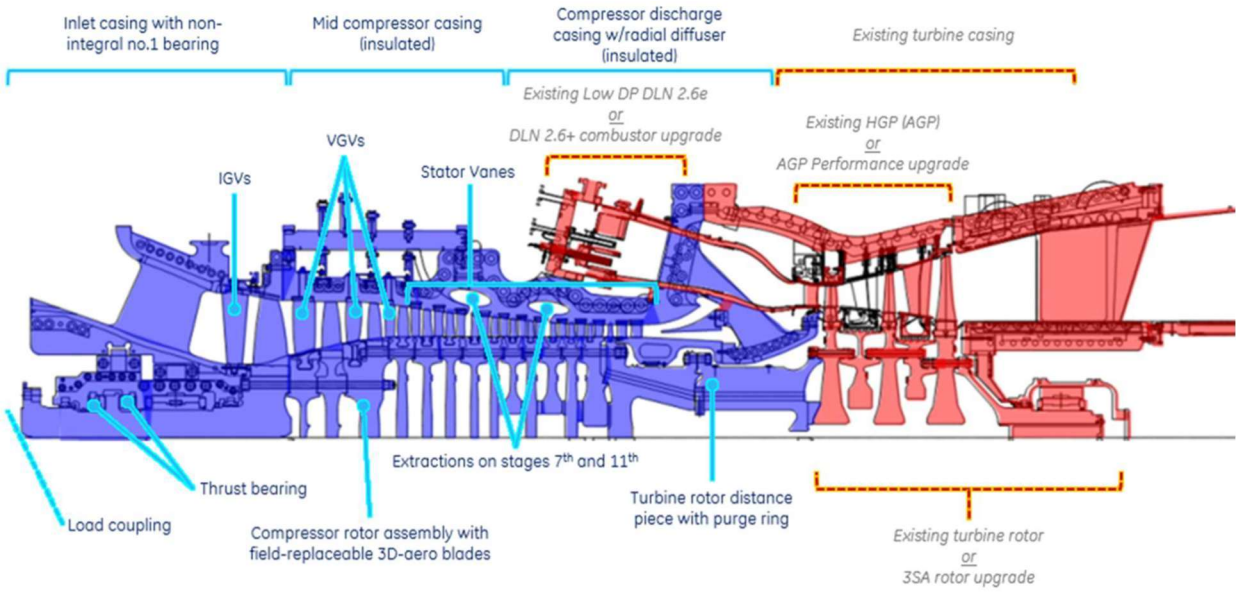

Figure 1. BWP will deploy the proposed turbine compressor system upgrade as one of two potential projects that can be deployed individually or collectively. Individual deployment of the compressor system, as discussed in this application, will be sufficient to increase system output capacity by 29.9 MW. Coordinated deployment of the compressor system and a separate advanced gas pathway upgrade (proposed separately) would allow BWP to increase capacity by 53.9 MW.

Briefly, the proposed upgrades will include an upgrade to an advanced compressor (e.g., GE 7F.04 -200), including retrofitting of a 7FA.05 compressor—GE's most advanced high efficiency compressor technology—along with a Gen-V turbine rotor, into MPP's gas turbine system, resulting in significant improvements to output and heat rate, as well as reliability and maintainability enhancements. The proposed compressor is composed of 14 stages, configured so as to increase flow rate, while accommodating inlet conditioning with improved leading edge erosion tolerance.

The compressor's first three stages will include variable stator vanes to provide a wider operating envelope while enhancing hot-day and partial-load system efficiency. System related maintenance improvements include an upgraded bolted steel construction, along with rotor blade and wheel design that allows their removal without pulling the rotor from its casing. The system will also include an advanced Blade Health Monitoring (BHM) system for stages 1 through 3 rotor blades, along with additional borescope holes in the compressor to simplify system inspections.

Collectively, these upgrades will support the following system improvements:

- Increased base load output & efficiency
- Improved part load efficiency
- Field replaceable compressor rotor blades

- Improved hot day performance
- Increase exhaust available energy to bottoming cycle for increased steam turbine output for combined cycle applications

Once complete, the proposed upgrades will provide reliable power production to support key local reliability benefits including:

- Up to 29.9 MW / 233,346 MWh/yr of new power generation capacity to support the following resilience and reliability outcomes:
    - Improved Burbank system islanding capabilities
    - Dispatchable power to support CAISO balancing authority area, up to a maximum of approximately 15.7 MW. The other 14.2 MW would be used in the LADWP balancing authority.
    - Support for Resource Adequacy, wherein up to 100% of new power produced by the system will be usable for resource adequacy requirements, either through SCPPA members or to CAISO.
    - Up to 179.6 MWh/d of power production capacity that could be used to support peak demand, from 4pm to 10pm
    - Improve reliability and reduce congestion within BWP's service area, areas served by SCPPA member agencies, and areas served by the CAISO grid, including local disadvantaged communities (DAC), many of which are currently served by ageing, capacity-restricted feeder lines
    - Support for CAISO as an ancillary service provider, supporting regulation up, regulation down, and spinning reserve

To minimize capital costs, the project will utilize BWP's existing MPP facility, as noted previously, which is located at 110 Magnolia Blvd., Burbank, CA, 91502. Existing electrical connections on site at the MPP are already designed to support output capacities targeted under the project (including under the combined project, should CEC fund both Burbank applications). All needed grid tie / interconnection lines to the power grid and to BWP's / SCPPA's systems are already in place. Moreover, as an upgrade to an existing facility, construction activities and associated costs will be limited, greatly reducing the total project deployment cost on a per megawatt basis.

During operation, the proposed system will help to alleviate existing peak period resource import constraints by producing load following / dispatchable, high-efficiency electricity. Operationally, BWP will seek to optimize system output to meet the combined needs of SCPPA members and CAISO. Additionally, by incrementally reducing BWP, SCPPA, LADWP, and CAISO reliance on lower-efficiency peak power production via single cycle turbines, the project will support a net GHG emissions reduction of up to 38,072 metric tonnes of carbon dioxide equivalent emissions per year (MT CO2e/yr) in greenhouse gas (GHG) emissions

0.3 Operational Goals and Objectives

Overarching **goal** of the project is to design, procure, construct/install, and commercially operate the proposed upgraded compressor system at the existing MPP site. The project will achieve this goal through the following **objectives**:

1. Design and engineer the proposed advanced compressor system upgrade, sufficient to increase system capacity by 29.9 MW, for installation at BWP's MPP; the system will

comply with all federal, state, and local laws and will be compatible for operation under CAISO rules and requirements.

2. Complete all permitting and environmental compliance requirements
3. Procure and construct proposed system
4. Commission the installed system, including confirmation of system operability, system level verification, ability to dispatch to BWP distribution, SCPPA, and CAISO
5. Complete 12 months of operational data collection, including system power output, emissions rates, hourly/daily/monthly energy exported, and other key parameters
6. Validate and verify a full range of system operability based data; key metrics to be evaluated will include:
    a. Confirm system provides an output capacity improvement of 29.9 MW,
    b. Verify an increase in capacity factor from 70-75% at present to approximately 89% under the project
    c. Confirm ability to provide power capacity that could increase islanded power production, in the event of a CAISO- or other grid-down event
    d. Confirm via testing that the system operates in compliance with all CAISO requirements, to support CAISO dispatchable power / resource adequacy applications
    e. Quantify local grid congestion reductions by tracking amount of system-produced power placed onto BWP's distribution grid and dispatched to SCPPA members
7. Offset at least 38,072 MT CO2e/yr during full system operation
8. Improve reliability for disadvantaged / underserved communities located within BWP's and SCPPA members' respective service areas by alleviating distribution system strain
9. Support statewide / CAISO system resiliency and operability by providing new power production capacity that can be leveraged by CAISO for resiliency, operability, or resource adequacy.

0.4 Implementation / Execution of Goals and Objectives Through the Scope of Work

The project, as proposed, will be sufficient to achieve all targeted goals and objectives identified in Section 0.3 above. Briefly, the project will include all engineering, design, and permitting needed to initiate the project. It will also include procurement and construction/installation of the proposed system and all required appurtenances. Following commissioning, BWP will operate and validate system operation for a period of 12 months. During this period, BWP will test and verify the efficacy of all targeted system operational parameters, including capacity, emissions benefits, and all resiliency outcomes and benefits described above. The project's scope of work will also ensure that project benefits are targeted to DACs, wherein the proposed facility will serve multiple DACs located within BWP's and SCPPA members' service areas, while also providing resiliency, GHG emissions reduction, and grid management improvements within this area.

1.0 STATEMENT OF FINANCIAL NEED

1.1 Existing and Anticipated Revenue Streams

Relevant to its electric utility system, Table 1 summarizes BWP revenue streams for fiscal years ending in 2020 to 2022 (in $1,000)—the most current financial statements available. As shown,

BWP relies on revenues derived primarily from retail sales, and to a lesser extent wholesale sales and other revenues.

Revenue Category	FY 2019-2020	FY 2020-2021	FY 2021-2022	Average
Operating Revenue: Retail	$158,024	$149,846	$154,304	$154,058
Operating Revenue: Wholesale	$15,442	$42,088	$21,486	$26,339
Other Revenues	$7,180	$8,946	$6,600	$7,575
Total Revenues	**$180,646**	**$200,880**	**$182,390**	**$187,972**
Table 2. BWP revenue streams, 2021 to 2023 ($1000s)				

1.2 Access to Feasible Project Financing

BWP has acquired access to project funding through SCPPA, as discussed and detailed in SCPPA's attached commitment letter. As a SCPPA member, BWP is eligible to receive such funding as appropriate to complete upgrades to its MPP system, wherein the MPP facility provides power via SCPPA to SCPPA's member agencies. The budget / cost estimates provided in support of this project were, moreover, developed based on direct, system-specific input and a preliminary proposal provided by GE to BWP. Therefore, the required cost estimates are considered to be reasonably reliable. SCPPA's funds are, however, constrained beyond the ask identified under the project. Moreover, providing a balanced financing structure is key to BWP's ability to maintain affordable rate structures for the communities that it serves. Burbank residents—particularly those neighborhoods classified as DACs—rely on BWP to maintain affordable rate structures. Also, despite strong annual revenues, ongoing expenses for general operations, as well as replacement of ageing equipment and response to increasingly common major weather events have strained BWP's ability to invest in capital to support improved resiliency. Other SCPPA member agencies served by the MPP also face similar constraints.

These financial constraints limit BWP's ability to fully execute the proposed system. Absent funding from the Energy Commission, BWP would be required to either not proceed on the project, or acquire funding from sources that will, ultimately, directly impact ratepayers to an extent that could be difficult for underserved ratepayers to bear. For example, alternate options available to BWP include increasing utility rates, or targeting bond funding or other debt-based funding, including such funding which may be available through SCPPA. The Energy Commission's investment, in contrast, will help BWP avoid rate increases while still meeting sustainability and reliability targets, and providing direct benefit to CAISO operation.

2.0 CONTRIBUTION TO RELIABILITY

2.1 Project Capacity and Timing of Operation

As noted previously, the project will install the proposed system upgrade, which will provide up to 29.9 MW / 233,346 MWh/yr of power production capacity.

The proposed system upgrades will be operated consistent with the existing operational parameters of the MPP, except that **additional capacity would be made available at any time when the MPP is operational**. Additional project derived capacity would be called upon to provide electricity under multiple use cases, wherein the specific reasons for calling additional capacity will likely vary seasonally and/or daily. Generally, timing of operation will be

determined based on peak power demand, either locally within BWP's system, via SCPPA (see Table 3 for (maximum) entitlement shares of the MPP, by SCPPA member), or CAISO. Project capacity will also support each of the operational goals and objectives described under Section 0.3, and these needs could also result in spin-up of the proposed system.

During the 12-month operational period, BWP will complete testing and validation for the proposed system upgrades, and will establish an optimized operating regime that supports balanced benefits to CAISO and to BWP's + SCPPA members' own distribution systems, as described in this proposal.

Participant	MPP Entitlement Share Percentage
Anaheim	38.0165%
Burbank	30.9917%
Cerritos	4.2%
Colton	4.1322%
Glendale	16.5289%
Pasadena	6.1307%
Totals	**100%**

Table 3. Entitlement share (maximum) of MPP power output by SCPPA member agency.

2.2 Grid Reliability Improvements During Peak Load

The project enable both CAISO and SCPPA members to utilize the proposed capacity increases to support peak load demand across their respective systems. Herein, CAISO would be responsible for scheduling power dispatch from the system; CAISO makes capacity calls on a 5-minute basis to each of the entitlement share allocations identified in Table 3, and would leverage this process to capture on-call peak power production from the project. Thus, in total, up to the proposed project's capacity increase above and beyond existing system operation could be made at any time / as needed to support peak load demand.

2.3 Nameplate / Power Output Capacity Increases and Restoration of Ambient Derates Due to High Temperature

The project will provide up to 29.9 MW of new power output capacity. This new capacity will be allocated as described in Section 2.1. Moreover, as described in Section 0.2, the proposed project upgrades would be designed and deployed so as to help alleviate power output deratings during hot inclement weather. While some degree of derating would nonetheless occur, up to the full capacity of the system's upgrade output could be put to use to offset high temperate derates. More generally, BWP will have flexibility to allocate all or a portion of this new capacity for improved management / resiliency of its own distribution system as needed, for the use cases described above in Sections 2.1, 2.2, and 0.3.

2.4 Leverage of the Existing Interconnection

As described in Section 0.2, the project will leverage BWP's existing CAISO grid interconnection point and its interconnection with SCPPA, which are located at its existing MPP facility. No modification to this interconnection point will be required, thereby minimizing capital costs for the project.

2.5 Extent to Which Project Capacity Will Be Committed to Resource Adequacy or Similar

One hundred percent (100%) of the proposed project's new capacity will be available to support the combined resource adequacy needs of SCPPA members (including BWP) and CAISO. Moreover, BWP will confirm via testing that the system operates in compliance with all CAISO requirements (see Section 6.0), to ensure that the system will support CAISO dispatchable power / resource adequacy applications

2.6 Load Service Through Bulk Transmission

The project will not directly support load service through bulk transmission within BWP's purview. For portions of the system's generation capacity under CAISO control, however, CAISO would have the option to utilize the system to manage its transmission system requirements, for example by offsetting the amount of transmission capacity needed to provide power in the region where the proposed system is located.

2.7 Performance During Emergency Events

The proposed upgrade system will provide several options to support improved performance and resiliency / reliability during emergency events, by providing up to its full capacity / output of resilient supply under various emergency events. Examples include the following:

- ***Partial loss of power supply.*** In the event of a partial supply loss, the proposed system could be used to provide additional temporary power to offset lost generation or reduced grid power available within BWP's system and/or to SCPPA members.
- ***Loss of grid connectivity.*** In the event that power is no longer available to BWP through the external grid, BWP's grid is capable of islanded operation, to the extent that it has sufficient power generation capacity to meet demand in its service area. Output capacity available through the proposed system upgrades will provide additional power supplies within BWP's service area to support increased resilience and improved power supply in the event of lost external grid connectivity.

3.0 PROJECT READINESS AND WORKPLAN

3.1 Project Schedule and Timeline Justification

The project team will execute the project according to the schedule shown in the following Gantt chart. As shown, the project team will complete the project within 36 months, starting in June 2024 and ending no later than June, 2027, consistent with CEC requirements (Figure 2). This proposed schedule allows sufficient time for completion of the project, and would also allow for completion of a sister deployment designed to further increase output capacity of the proposed system (see separate BWP application to the Energy Commission). The proposed schedule aligns with preliminary engineering evaluations completed to date, and with a preliminary proposal received from GE for the proposed upgrades. Moreover, BWP has included sufficient buffer time to provide schedule flexibility, in the event that it is needed.

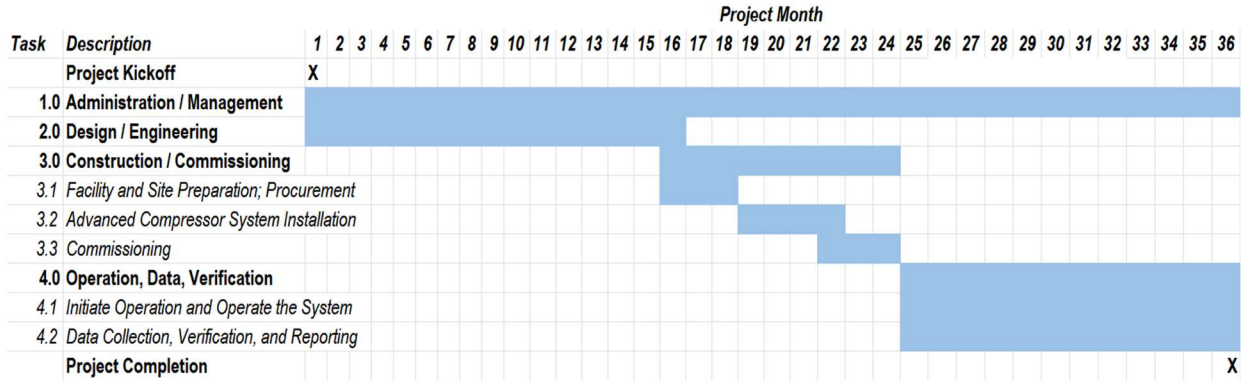

Figure 2. Project Gantt chart.

3.2 Approach to Performing the Work

The project team will follow a standard process for execution that will include engineering / design, followed by procurement and construction, in accordance with BWP's standard process. BWP has already identified GE as the proposed technology / system provider. This decision was made

based on the existing technology available on site, which is a GE-brand gas turbine. Design as relevant to the proposed system upgrades funded by this grant project will focus on the specific elements needed to for installation of the proposed advanced compressor system, and full integration with BWP's existing control system.

Once design is complete, GE will complete all site preparation, and install all proposed equipment so as to minimize downtime. Presently, GE is estimating a total offline time of 94 days. Following completion of the installation process, GE and BWP will commission the system and all components. Upon successful completion of commissioning, BWP will initiate operation of the project and complete 12 months of data collection, pursuant to the discussion provided in Section 2.0, and in accordance with the Measurement and Verification (M&V) plan provided in Section 5.0.

3.3 Project Tasks and Subtasks

The project will include the following tasks and subtasks; refer to the attached Scope of Work for additional information.

- **Project Administration and Management (Task 1):** The Recipient will complete all needed bids, contractor selection, contracting, budget and schedule tracking, progress tracking, milestone tracking, and all other day to day project administration and management activities. The Recipient will also complete all CEC-required deliverables and documents / products under this activity.

- **System Design, Engineering, and Permitting (Task 2):** The Recipient will oversee the completion of all system design and engineering, which will include limited engineering and design required for integration of the proposed compressor system with the existing combined cycle gas turbine. Permitting will be included in this activity, wherein permitting activity will be limited to modification of the facility's existing air permits. This task will also include CEQA compliance, wherein the Recipient will work to supply needed information to the Energy Commission—the lead agency—to support completion of the CEQA process. (Task 2).

- **System Construction and Commissioning (Task 3):** The Recipient and its contractors will oversee the procurement and construction of the proposed system. Briefly, within the boundary of this grant application, the Recipient's contractor will complete procurement of the proposed advanced turbine compressor equipment, then complete all needed site preparation needed for the installation process (Subtask 3.1). Site preparation requirements are anticipated to be limited in scope, but will be determined during the final design process under Task 2. Once site preparation is complete, the Recipient will shut down the facility, then the Recipient's contractor will install the proposed compressor system (Subtask 3.2) and all appurtenances in accordance with system design and engineering completed under Task 2. Once installation is completed, the Recipient and its contractor engineering team will oversee commissioning of the system to ensure its operability in accordance with targeted standards and metrics (Subtask 3.3). Although funded separately, if the Recipient also receives Energy Commission funding for the advanced gas path resiliency upgrade project, the Recipient and its contractor will complete upgrades proposed under that sister scope of work concurrent to this compressor system procurement, installation, and commissioning process.

- **Data Collection, Measurement & Verification, and Reporting, Including Benefits Reporting (Task 4):** The Recipient will operate the project for a period of 12 months. During that time, the Recipient will operate the system according to multiple use cases as discussed in the project narrative for this grant application. The Recipient will also collect data and document all outcomes and claims made in the narrative proposal, through a formal measurement and verification process, as described therein. Analysis will include a review of achieved (quantified) GHG and other pollutant emissions reductions, along with benefits related to resource adequacy, resiliency, community benefits, improved renewables management, and other key system benefits. This analysis will be incorporated into the project's final report for the CEC.

3.4 Project Location

The project will be located at the existing Magnolia Power Plant, 110 Magnolia Blvd., Burbank, CA, 91502. This existing facility includes the current MPP system, an existing, combined cycle, natural gas fired power generation facility, with a current output capacity of 247.4 MW at full load. The project will leverage the existing facility's turbine and generator systems, controls system, controls and administration / operation buildings, grid tie in lines, and physical land area to support the project.

3.5 Permits and Environmental Compliance

Permitting requirements for the project will include an amendment to the facility's current Title V permit to operate from the South Coast Air Quality Management District (SCAQMD) and an amendment to the facility's California Energy Commission (CEC) Conditions of Certification. For the proposed modifications, the CEQA process will be performed as part of amending the CEC conditions of certification. The CEC will also serve as the lead agency for CEQA. While BWP reached out to the CEC to confirm this role, CEC was unable to respond because the application period for this grant application was already underway. Nonetheless, based on input provided by BWP's environmental compliance team, given that the project will not require any ground disturbance and will target increases to power production through upgrade of the existing turbine system, we anticipate that an Initial Study / Mitigated Negative Declaration (IS/MND) will be sufficient to complete CEQA compliance. CEC will, of course, confirm or amend this outcome during the project period. Moreover, if BWP is able to deploy both the project and the project identified in its sister grant application to CEC, both upgrades would be considered under the same CEQA / permitting process. Refer to the CEQA Compliance Form for additional details.

3.6 Interconnection Studies and Approvals Needed to Initiate Operations

Based on preliminary engineering work and evaluations completed to date, the project will not require additional interconnection studies prior to initiation of operation. The system will require CAISO testing during the commissioning process, to verify system operability and operational parameters. But BWP will otherwise utilize existing grid connections. No additional interconnection studies or approvals are required

3.7 Risks, Barriers, and Other Factors Relevant to Project Completion

Key risks, barriers, and mitigating factors relevant to the project include the following:

- Schedule performance risk. Due to unforeseen factors, such as procurement delays or engineering or construction management delays, the project could be delayed and targeted milestone dates could be missed. Mitigation: BWP has developed the proposed project schedule based on reasonable engineering, procurement, and construction / commissioning timeframes, as relevant to the proposed system. Moreover, BWP has

included several months of buffer time within the schedule to account for and effectively handle potential unforeseen delays during the development and execution process.

- Cost performance risk. Project cost may exceed expectations; the proposed equipment may be subject to variable costs. Mitigation: BWP has already retained GE to complete an evaluation of the system for upgrade, and has already acquired a preliminary proposal for the proposed upgrade. This proposal was developed consistent with those identified costs, and the full GE proposal can be made available to the CEC upon request.
- Testing constraints for demonstration of proposed emergency support / services. BWP recognizes that an emergency event that could trigger need for islanding within BWP's system may not occur during the 12-month demonstration window. Mitigation: BWP has identified procedures in its Measurement and Verification plan to test these elements even without an emergency event.

4.0 CLIMATE AND AIR QUALITY REQUIREMENTS

4.1 Required GHG and Emissions Reporting; GHG Emissions Benefits

GHG emissions were evaluated based on the increase in power generation from the MPP's combined cycle power plant, by comparing its updated heat rate (Btu/kWh) under the project, to a peaker plant (simple cycle gas turbine) operated by BWP that would have likely generated the same power in the absence of the MPP upgrade.

Under the project, the proposed increase in generation output at MPP would be utilized during times of peak energy, when alternative energy sources (i.e. wind and solar) are not available. During this time, it is likely that peaking plants would run to provide the additional power needed on the grid. Moreover, peak power production could be called up by BWP, SCPPA members, and/or CAISO.

Based on these assumptions / determinations, BWP calculated that the upgraded MPP would require only 6,614 Btu/kWh compared to 11,030 Btu/kWh for a typical peaker plant, meaning that MPP would use 4,416 Btu less for each kWh generated from the MPP system upgrade. Considering that the MPP upgrade would generate 233,346 MWh more power per year, that would equate to annual decrease of natural gas usage, in comparison to the baseline scenario described above, to avoid GHG emissions of approximately 38,072 MT CO2e with the plant upgrade. Key factors for this determination include:

1. MPP heat rate of 6,614 Btu/kWh provided by GE.
2. Typical Peaker plant heat rate of 11,030 Btu/kWh provided by EIA: https://www.eia.gov/electricity/annual/html/epa_08_02.html.
3. Annual Electricity Production Increase Provided by MPP staff.
4. GHG CO2e Emission factor of 53.11 kg CO2e/MMBtu for natural gas combustion emissions and associated conversions obtained from EPA, specifically Tables A-1, C-1 and C-2 from 40 CFR Part 98.

Table 4 summarizes the total GHG emissions reductions / offsets that would result from project operation per year.

Pollutant	**Annual Emissions Reduction**
CO_2	38,072 MT CO2e/yr
Table 4. Emissions avoided as a result of project deployment per year	

4.3 Air Permit Modifications

Permitting requirements for the project will include an amendment to the facility's current Title V permit to operate from the South Coast Air Quality Management District (SCAQMD) and an amendment to the facility's California Energy Commission (CEC) Conditions of Certification. See also Section 3.5.

5.0 PROJECT BUDGET AND COST EFFECTIVENESS

5.1 DEBA Funding per MW of Incremental Rated Capacity

In total, the project will expend $23,293,654 in Energy Commission funding to provide 29.9 MW of new incremental rated capacity. This is equivalent to $23,293,654 / 29.9 MW = $779,05 per MW of new incremental rated capacity.

5.2 Documented and Secured Match Funding

SCPPA, on behalf of BWP, has committed to providing a total of $24,000,000 in total match funding, equivalent to a 50.7% cost share, for a total project cost of $47,293,654. Cost share will be provided as follows: $646,354 to be provided as in-kind cost share to offset direct labor and fringe benefits costs to be incurred by BWP staff, $92,300 in cash match for equipment rentals during construction, and $23,261,346 to be provided as additional cash match to support subcontracting and equipment purchase under the project. Refer to the attached commitment letter from SCPPA, which includes the total match share commitment for the project.

5.3 Financial Ability to Execute and Operate the Project

BWP is financially salient and has the financial ability to execute and operate the project. With an extensive history, BWP consistently provides reliable service within its service area. Moreover, as discussed in Section 2, BWP maintains a viable balance between cash flow and expenses, and with support from SCPPA, will have sufficient cash in hand at present to provide all cost share requirements for the project.

5.4 Project Risks and Mitigation

Refer to Section 3.7 for a discussion of project risks and mitigation. Additionally, in the unlikely event that BWP's cost share becomes available, SCPPA has identified a source of backup funds for the project to support the CEC-required cost share, wherein SCPPA would make funds available through a combination of current project reserves, future revenue collections, and/or financing.

5.5 Reasonableness of the Budget

BWP has designed the proposed budget to be highly reasonable. Briefly, BWP requests $23.3 million in CEC funds to design, procure, build, commission, and validate / operate the proposed system upgrade, as described previously. BWP will match these funds with $24.0 million in local match. Moreover, BWP is not charging overhead or indirect to the grant or as cost share. Most importantly, BWP proposes to deeply leverage its existing facilities to support the project, meaning that CEC's relatively small investment will result in a disproportionately large outcome in terms of new MW online within BWP's service area. Please refer to the attached Budget Form for a summary of the proposed budget.

6.0 REPORTING AND MEASUREMENT AND VERIFICATION PLAN

Under the project, BWP will execute the following Measurement and Verification (M&V) Plan, which provides for both ***performance evaluation during a simulated or actual emergency event***, and ***emergency performance reporting***, as well as verification / validation of all relevant claims made within this proposal.

BWP will be responsible for and will oversee all data collection and reporting. Except as specified below, data collection will be performed through BWP's control system, which will be updated to integrate the proposed turbine system upgrades as an element of the project. The control system will automatically collect daily and hourly data by default. Minute by minute data collection can also be optionally captured. Data collected will be analyzed and evaluated, then reported out to the Energy Commission in quarterly reports and during one final report (refer to the Scope of Work). To this end, BWP will execute the following M&V Plan during the 12-month operational period; for convenience, the M&V Plan is organized to align with the project objectives identified in Section 0.3.

- **Objective:** Design and engineer the proposed advanced compressor system upgrade, sufficient to increase system capacity by 29.9 MW, for installation at BWP's MPP; the system will comply with all federal, state, and local laws and will be compatible for operation under CAISO rules and requirements. **Measurement and Verification:** BWP will measure and verify output capacity, as installed, during the commissioning process. Additionally, CAISO will complete a capacity check and certification (Pmax) at the point of delivery, immediately prior to the initiation of operation. BWP will request the certification outcomes / results from CAISO and report to the CEC.

10. **Objective:** Commission the installed system, including confirmation of system operability, system level verification, ability to dispatch to BWP distribution, SCPPA, and CAISO. **Measurement and Verification:** GE under supervision of BWP will complete the commissioning process to verify all system operational parameters, to support operation of the facility to supply power to BWP's service area, and to SCPPA members and CAISO. Moreover, CAISO will complete a certification process near the end of system commissioning, prior to the initiation of full operation. During this process, CAISO will confirm the systems operation including system operability, system level verification, and verify CAISO interconnection. BWP will collect results from these tests and report to the CEC.

- **Objective:** Complete 12 months of operational data collection. **Measurement and Verification:** BWP will collect at minimum hourly data on the following parameters, at minimum: system power output, emissions rates, hourly/daily/monthly energy exported, and other key parameters determined to be relevant by BWP or CEC. Additionally, while CAISO's and BWP's dispatch systems will log hourly by default, BWP's control system will also be capable of logging most measurements on a minute by minute basis. If needed / as warranted, BWP will, at its own discretion, also download these additional detailed data to understand and verify / validate system operation.

- **Objective**: Validate and verify a full range of system operability as follows; BWP will report all outcomes to the CEC:
    - Confirm system provides an output capacity improvement of 29.9 MW. **Measurement and Verification:** These outcomes will be verified during the commissioning process, as described above.
    - Verify an increase in capacity factor from current (70% to 75%) to approximately 89%. **Measurement and Verification:** These outcomes will be preliminarily verified during the commissioning process, during a preliminary operation period, then will be verified in full detail via ongoing data colleciton during the proposed 12-month data collection period. These data will be reported to CEC during quarterly M&V reporting.

- Confirm ability to provide power capacity that could increase islanded power production, in the event of an external grid-down event. **Measurement and Verification.** In the event that a grid down event occurs during the 12-month operational data collection period, BWP will track all power produced by the system for use within its service area and/or within SCPPA member services areas, then report out those amounts to the CEC. If not grid down event occurs, BWP will verify the facility's ability to dispatch electricity directly to BWP's own distribution grid, up to the total amount provided by the proposed project expansion. Moreover, BWP will collaboratively evaluate and consider, in coordination with the Energy Commission, other reasonable potential processes for providing further emergency system validation in the event that a grid down event suitable for testing may not otherwise occur.
- Confirm via testing that the system complies with all CAISO requirements, to support CAISO dispatchable power / resource adequacy applications. **Measurement and Verification.** Again, CAISO and the project team will complete a series of tests including Pmax, Pmin, regulation up, and down, wherein CAISO takes control of the system, then increases and decreases the output to verify CAISO control. CAISO will measure multiple parameters including but not limited to the ramp rate and response time. CAISO will also verify that they can call on the system to start successfully providing power within applicable time requirements, and verify all other CAISO requirements. BWP will gather results from CAISO and report to the CEC.
- Quantify BWP's and SCPPA's grid congestion reductions by tracking amount of system-generated power placed onto BWP's distribution grid. **Measurement and Verification.** BWP will track the amount of power placed onto BWP's grid and routed to SCPPA members from the project, measured at the point of delivery.

- **Objective:** Offset at least 38,072 MT CO2e/yr during full system operation. **Measurement and Verification.** BWP will track the daily, monthly, and annual power production from the project, and compare to historic periods to identify net GHG and other emissions reductions. BWP will collect these data and report to the CEC.

11. **Objective:** Improve reliability for disadvantaged / underserved communities located within BWP's and SCPPA members' respective service areas by alleviating distribution system strain. **Measurement and Verification.** BWP will track power discharged from the project onto BWP's power grid, and to SCPPA members. During peak periods, all power dispatched during these periods will alleviate distribution system strain, thereby improving reliability for DACs served in these areas. BWP will collect these data and report to the CEC.

ATTACHMENT 4
Scope of Work

The Recipient proposes the following Scope of Work to support and ensure execution of the project.

1.0 Task List.

The following table summarizes the task numbers and names for the project, including subtasks as applicable.

Task or Subtask No.	Name
1.0	**Project Administration and Management**
2.0	**System Design and Engineering, Permitting**
3.0	**System Construction and Commissioning**
3.1	*Facility and Site Preparation, and Procurement*
3.2	*Advanced Compressor System Installation*
3.3	*System Commissioning*
4.0	**System Operation and Data Collection / Verification**
4.1	*Initiate Operation and Operate the System*
4.2	*Data Collection, Verification, and Reporting, including Benefits Reporting*

2.0 Activities.

Project activities align closely with the tasks identified in Section 1.0. Herein, the Recipient will complete the following activities:

- **Project Administration and Management (Task 1):** The Recipient will complete all needed bids, contractor selection, contracting, budget and schedule tracking, progress tracking, milestone tracking, and all other day to day project administration and management activities. The Recipient will also complete all CEC-required deliverables and documents / products under this activity.

- **System Design, Engineering, and Permitting (Task 2):** The Recipient will oversee the completion of all system design and engineering, which will include limited engineering and design required for integration of the proposed compressor system with the existing combined cycle gas turbine. Permitting will be included in this activity, wherein permitting activity will be limited to modification of the facility's existing air permits. This task will also include CEQA compliance, wherein the Recipient will work to supply needed information to the Energy Commission—the lead agency—to support completion of the CEQA process. (Task 2).

- **System Construction and Commissioning (Task 3):** The Recipient and its contractors will oversee the procurement and construction of the proposed system. Briefly, within the boundary of this grant application, the Recipient's contractor will complete procurement of the proposed advanced turbine compressor equipment, then complete all needed site preparation needed for the installation process (Subtask 3.1). Site preparation requirements are anticipated to be limited in scope, but will be determined during the

final design process under Task 2. Once site preparation is complete, the Recipient will shut down the facility, then the Recipient's contractor will install the proposed compressor system (Subtask 3.2) and all appurtenances in accordance with system design and engineering completed under Task 2. Once installation is completed, the Recipient and its contractor engineering team will oversee commissioning of the system to ensure its operability in accordance with targeted standards and metrics (Subtask 3.3). Although funded separately, if the Recipient also receives Energy Commission funding for the advanced gas path resiliency upgrade project, the Recipient and its contractor will complete upgrades proposed under that sister scope of work concurrent to this compressor system procurement, installation, and commissioning process.

- **Data Collection, Measurement & Verification, and Reporting, Including Benefits Reporting (Task 4):** The Recipient will operate the project for a period of 12 months. During that time, the Recipient will operate the system according to multiple use cases as discussed in the project narrative for this grant application. The Recipient will also collect data and document all outcomes and claims made in the narrative proposal, through a formal measurement and verification process, as described therein. Analysis will include a review of achieved (quantified) GHG and other pollutant emissions reductions, along with benefits related to resource adequacy, resiliency, community benefits, improved renewables management, and other key system benefits. This analysis will be incorporated into the project's final report for the CEC.

3.0 Timetable

The Recipient will complete the proposed project over a period of 36 months, as shown in the Gantt table below. Note that if the Energy Commission chooses to fund both this project and the complementary advanced gas path resiliency project, the schedules for both projects will be aligned to be completed concurrently, so as to minimize system downtime. Anticipating a start date of June, 2024, all project activities would be complete no later than June, 2027.

		Project Month																																	
Task	Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
	Project Kickoff	X																																			
1.0	**Administration / Management**																																				
2.0	**Design / Engineering**																																				
3.0	**Construction / Commissioning**																																				
3.1	*Facility and Site Preparation; Procurement*																																				
3.2	*Advanced Compressor System Installation*																																				
3.3	*Commissioning*																																				
4.0	**Operation, Data, Verification**																																				
4.1	*Initiate Operation and Operate the System*																																				
4.2	*Data Collection, Verification, and Reporting*																																				
	Project Completion																																				X

4.0 Task Products

The Recipient will deliver the following task products:

- **Task 1.0. Project Administration and Management:**
  - All CEC-required administrative products, including the following:
    - Bimonthly status updates (emailed summary to CAM every two months plus a follow up call with the CAM to discuss project status updates).
    - Quarterly invoicing (using CEC's template invoice spreadsheet).

        - Measurement and Verification Reports (annual measurement and verification data and performance reports on the project according to a measurement verification plan approved by the CAM; note that the final M&V report will include a technical evaluation of the project outcomes and is discussed and considered in additional detail under Task 4).
        - Final report (draft and final)
    - Notification of Selection of Contractors for all engineering, procurement, and / or construction contractors to be selected under the project.
    - Notification of Completion of all contracting

- **Task 2.0. System Design and Engineering, Permitting**
    - Notification of Completion of Final System Design
    - Build-Ready Engineering Cover Sheet
    - Procurement List
    - Final Permitting Documentation / CEQA completion (Certification / approval notice for the completed CEQA document, assumed to be an IS/MND completed through the Energy Commission)

- **Task 3.0. System Construction and Commissioning**
    - Construction plan (Subtask 3.1)
    - Notification of initiation of site construction (Subtask 3.1)
    - Notification of completion of site preparation (Subtask 3.2)
    - Construction report (Subtask 3.2)
    - Commissioning Plan (Subtask 3.3)
    - Commissioning Report (Subtask 3.3)

- **Task 4.0. Advanced Compressor System Operation and Data Collection / Verification**
    - Notification of Initiation of System Operation (Subtask 4.1)
    - Quarterly Operational Data and Verification Reports, (4 total; Subtask 4.2) with Benefits and Measurement and Verification Reporting as required by the Energy Commission (Subtask 4.2)

5.0 Administrative Tasks

Please refer to Section 4.0, under the Task Products list for Task 1.0.

6.0 Summary Table

Name of Applicant: Burbank Water and Power / City of Burbank
Proposal Title: City of Burbank Magnolia Power Project: Advanced Compressor Resiliency Upgrade

Tasks	Activities	Timetable in months	Product(s)/ Deliverable(s)
Task 1. Project Administration and Management	Complete all required administration and reporting activities; also complete all contracting	M1 to M36	All CEC-required products: bimonthly status updates, quarterly invoicing, M&V reports, Final Report (draft and final), Notification of Selection

ATTACHMENT 4
Scope of Work

Tasks	Activities	Timetable in months	Product(s)/ Deliverable(s)
	and contractual agreements		of Contractors, Notification of completion of all contracting
Task 2. System Design and Engineering, Permitting	Complete all system design, engineering, and permitting	M1 to M16	Notification of Completion of Final System Design; Build-Ready Engineering Cover Sheet; Procurement List; Final Permitting Documentation / Notification of CEQA completion
Task 3. System Construction and Commissioning	Complete all procurement, construction, and commissioning for the project	M16 to M24	Construction plan; Notification of initiation of site construction; Notification of completion of site preparation; Construction report; Commissioning Plan; Commissioning Report
Task 4. System Operation and Data Collection / Measurement and Verification	Initiate operation. Then operate the system for a period of 12 months to support all measurement and verification activities; collect and analyze data during this period and verify all outcomes.	M25 to M36	Notification of Initiation of System Operation; Quarterly Operational Data and Verification Reports, with Benefits Reporting (4 total)

Reference 2:

Magnolia Power Project - Advanced Gas Path System Upgrade CEC questionnaire and related attachments

CALIFORNIA ENERGY COMMISSION

CALIFORNIA NATURAL RESOURCES AGENCY

Rev 07/07/2022

POST CERTIFICATION PROJECT CHANGE QUESTIONNAIRE

Project Name	Magnolia Power Project (Advanced Gas Path Resiliency Upgrade)	Docket #	01-AFC-6C
Contact Name	Claudia Reyes	Date	5/20/2024
Contact Phone Number	818-331-7836		

1. Please provide a detailed description of the proposed change(s). Please note if the work will be conducted during regularly scheduled maintenance or if a special shut down of the operation is required. Whenever possible please support your request with preliminary engineering drawings/plans, including materials list, type, size quantity, cut sheets, MSDS sheets, photographs, sketches, etc. Also include anticipated schedule and commencement date, work duration, and expected number of employees. Describe why the project change is needed (e.g., due to changes in regulation or operation and maintenance specifications, equipment, or component failure).

   Burbank Water and Power (BWP) is the project applicant and operating agent for the Magnolia Power Plant (MPP), which serves members of the Southern California Public Power Authority (SCPPA). MPP provides energy to the cities of Anaheim, Burbank, Cerritos, Colton, Glendale, and Burbank.

   BWP proposes to design, engineer, deploy, and operate a new, advanced gas path system upgrade to its existing MPP, sufficient to increase the facility's effective power output by up to 24.0 MW / 187,114 MWh/yr for resiliency and resource adequacy improvements. The resulting targeted upgrades will provide increased power supply to support local communities and residents within the region.

   The MPP is an existing, combined cycle, natural gas fired power generation facility, with a current output capacity of 247.4 MW at full load. Under the project, BWP seeks to upgrade the existing gas turbine portion of the MPP to support an increase in power production. BWP proposes to add an advanced gas pathway to the project's existing gas turbine system, sufficient to increase system efficiency and drive increased power production.

   The proposed upgrades will include an upgrade of the MPP's existing gas turbine with an Advanced Gas Path Tech Package (e.g., GE 7F.04). The proposed system includes an update and redesign of three stages of system buckets, nozzles, and shrouds to enhance performance. Key updates include improved aerodynamic design, materials improvements, and updated design to minimize stress and improve cooling efficiency in State 1; an updated bucket tip shroud, improved alloys, and updated nozzle hook sealing to improve efficiency in Stage 2; and a larger bucket tip, updated shroud alloys, and updated nozzle materials to enable higher firing temperature and increased output in Stage 3.

   When complete, the project will provide the following technical benefits to the existing system:
   - Increased output flexibility
   - Improved energy efficiency and fuel cost efficiency
   - Reduced emissions footprint
   - Increases maintenance intervals by up to 30%
   - Supports extended parts life
   - Reduces startup time by approximately 30%

   If the project activities begin on June, 2024, all project activities would be complete no later than June,

2027.

Please refer to the attached GFO-23-401 grant application documentation for additional information regarding project description and schedule.

1) Burbank Project Narrative
2) Burbank Scope of Work

This work does not align with existing outages due to component lead times. A special outage would be required in 2027 to install the upgrade. One approximately 95-day outage is required for both the Advanced Gas Path and sister project Advanced Compressor.

2. Would the proposed modification alter the project design, operation, or performance requirements as described in the project's Final Commission Decision (Decision) (e.g., project description) or as described in any subsequent amendments or any documents incorporated by reference (e.g., Application for Certification (AFC), AFC Supplements, Final Staff Assessment, etc.)? ☒ Yes ☐ No

   The proposed modification would upgrade MPP's existing gas turbine with an Advanced Gas Path Tech Package.

3. Would the proposed project change cause a direct physical change or reasonably foreseeable indirect physical change to the site or equipment on site? If yes, please explain. ☒ Yes ☐ No

   The proposed project would result in changes to equipment onsite, specifically replacement of combustion turbine gas path parts with upgraded parts. These are internal to the existing combustion turbine and there would be no noticeable external changes.

   a. Is the proposed project change to software? ☐ Yes ☒ No
   b. Is there a change to method of operation or how the facility is being operated? If NO, please explain. ☐ Yes ☒ No

   The facility's method of operation will not change.

4. Would the proposed change result in change to, or deletion of, a condition of certification adopted by the commission in the Decision or subsequent amendments? If YES, please provide detailed description: ☒ Yes ☐ No

   Yes, the COC Air Quality section will need to be modified to include updated SCAQMD Title V permit conditions. CEC staff will confirm if other sections need to be updated.

5. Are there any additional permits from other agencies required? If YES, which permits/agencies, have you already filed a permit application, and what is the proposed timing for these permits? ☒ Yes ☐ No

This project will require a South Coast Air Quality Management District Title V permit modification. Based on previous permit application submittals, the anticipated schedule is as follows:

Permit Application Submittal – July 2024
Permit Review 8 – 15 months- March 2025- October 2025

FOR INTERNAL USE ONLY

Please provide your response to the Compliance Project Manager by Click or tap to enter a date.

Office	Initials	Date	PTA or NPTA	DCBO Required?	On Call or RFQ Contract
CME Supervisor					
S&R Branch Manager					
Engineering Branch Manager					
Siting Branch Manager					
Transmission Supervisor					
CCO					

ATTACHMENT 2
Project Narrative Form

City of Burbank Magnolia Power Project: Advanced Gas Path Resiliency Upgrade

Burbank Water and Power

City of Burbank, California

February 20, 2024

ATTACHMENT 2
Project Narrative Form

Table of Contents

ATTACHMENT 2
Project Narrative Form

0.0 PROJECT SUMMARY AND PROJECT DESCRIPTION

0.1 Project Summary

Burbank Water and Power (BWP) proposes to design, engineer, deploy, and operate a new, advanced gas path system upgrade to its existing Magnolia Power Plant (MPP), sufficient to increase the facility's effective power output by up to 24.0 MW / 187,114 MWh/yr for resiliency and resource adequacy improvements. Power generated by the system will be made available for multiple uses during normal operating hours, including during peak and high peak periods. For example, the project will provide up to its full capacity during peak demand periods (e.g., 4pm to 10pm), equivalent to up to 144 MWh/d of new peak power production.

BWP is the project applicant and operating agent for the MPP, which ultimately serves members of the Southern California Public Power Authority (SCPPA). Herein, MPP provides energy to the cities of Anaheim, Burbank, Cerritos, Colton, Glendale, and Burbank. The resulting targeted upgrades will provide increased power supply to support local communities and residents within the region. The additional power delivered by the facility will help to reduce reliance on more inefficient forms of generation, thereby resulting in a net reduction in GHG and criteria air pollutant emissions during peak power production periods, for power offset by the upgraded facility. Moreover, the project will also alleviate local transmission bottlenecks, and help ensure that potential for brownout and blackout conditions are substantially reduced, especially when the state's grid is under high demand / high strain conditions. It will also provide more inertia, which is required for electric system reliability and needed as more renewable energy resources are brought online.

The project will also support multiple benefits to local communities, including reduced upward pressures on rates in comparison to bringing online additional power generation via a new peak power production plant or other greenfield facility, or upgrading / replacing ageing transmission and distribution (T&D) infrastructure. Moreover, the project will result in a reduction of 30,529 metric tonnes of carbon dioxide equivalent emissions per year (MT CO2e/yr) in greenhouse gas (GHG) emissions, along with associated reductions in nitrogen oxides (NOx) and carbon monoxide (CO) due to a significant improvement in efficiency in comparison to peak power supplies that the project would offset.

0.2 Project Description

The MPP is an existing, combined cycle, natural gas fired power generation facility, with a current output capacity of 247.4 MW at full load.[1] Under the project, BWP seeks to complete targeted upgrades to the existing gas turbine portion of the MPP to support an increase in power production. BWP has already

MPP Configuration	Full Load Output	Full Load Heating Rate (lower heating value)
Existing	247.4 MW	6,061.00
With Project (Advanced Gas Pathway)	277.3 MW	5,976.15
Project Benefit	24.0 MW increase	84.86 reduction (improvement)

Table 1. Project capacity improvements

[1] Note that the MPP's nameplate capacity is higher than its actual output, due to a higher historic system capacity (a portion of the MPP's generation capacity was previously removed, lowering the facility's output) and because the system is only capable of reaching or approaching its nameplate output during very low ambient temperatures.

initiated early-phase coordination with GE Vernova (GE), the manufacturer of the MPP's existing gas turbine system, regarding potential upgrades to its system to increase energy efficiency and output capacity. To this end, GE has suggested two potential system upgrades, which could be installed individually or in tandem (Figure 1). Under this proposal, BWP proposes to add an advanced gas pathway to the project's existing gas turbine system, sufficient to increase system efficiency and drive increased power production as indicated above. Table 1 (above) summarizes the technical outcomes of the proposed advanced gas pathway project.

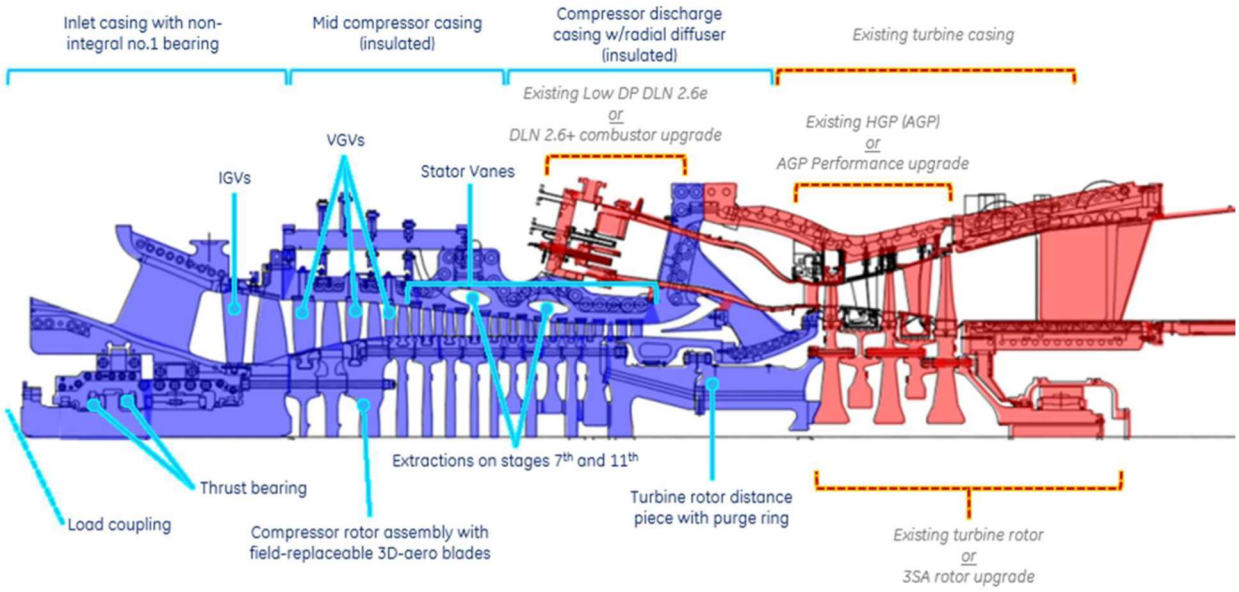

Figure 1. BWP will deploy the proposed advanced gas pathway system upgrade as one of two potential projects that can be deployed individually or collectively. Individual deployment of the advanced gas pathway system, as discussed in this application, will be sufficient to increase system output capacity by 24.0 MW. Coordinated deployment of the advanced gas pathway and a separate compressor system upgrade (proposed separately) would allow BWP to increase capacity by 53.9 MW.

Briefly, the proposed upgrades will include an upgrade of the MPP's existing gas turbine with an Advanced Gas Path Tech Package (e.g., GE 7F.04). The proposed system includes an update and redesign of three stages of system buckets, nozzles, and shrouds to enhance performance. Key updates include improved aerodynamic design, materials improvements, and updated design to minimize stress and improve cooling efficiency in State 1; an updated bucket tip shroud, improved alloys, and updated nozzle hook sealing to improve efficiency in Stage 2; and a larger bucket tip, updated shroud alloys, and updated nozzle materials to enable higher firing temperature and increased output in Stage 3. Figure 2 summarizes these targeted upgrades.

When complete, the project will provide the following technical benefits to the existing system:

- Increased output flexibility
- Improved energy efficiency and fuel cost efficiency
- Reduced emissions footprint
- Increases maintenance intervals by up to 30%
- Supports extended parts life

- Reduces startup time by approximately 30%

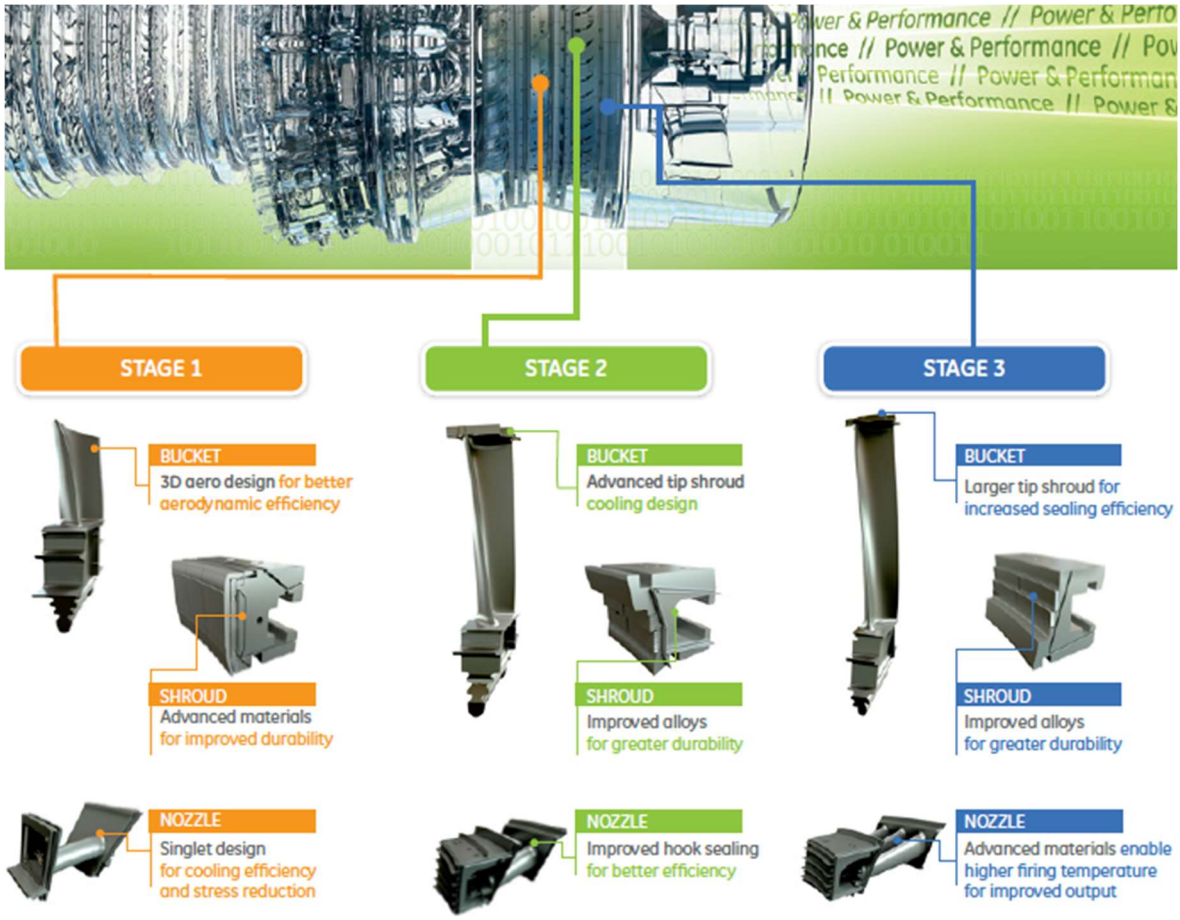

Figure 2. GE's advanced gas path upgrade includes bucket, shroud, and nozzle improvements to all three applicable stages.

Once complete, the proposed upgrades will provide reliable power production to support key local reliability benefits including:

- Up to 24.0 MW / 187,114 MWh/yr of new power generation capacity to support the following resilience and reliability outcomes:
    - Improved Burbank system islanding capabilities
    - Dispatchable power to support CAISO balancing authority area, up to a maximum of approximately 12.6 MW. The other 11.4 MW would be used in the LADWP balancing authority.
    - Support for Resource Adequacy, wherein up to 100% of new power produced by the system will be usable for resource adequacy requirements, either through SCPPA members or to CAISO.
    - Up to 144 MWh/d of power production capacity that could be used to support peak demand, from 4pm to 10pm
    - Improve reliability and reduce congestion within BWP's service area, areas served by SCPPA member agencies, and areas served by the CAISO grid, including local

disadvantaged communities (DAC), many of which are currently served by ageing, capacity-restricted feeder lines

- Support for CAISO as an ancillary service provider, supporting regulation up, regulation down, and spinning reserve

To minimize capital costs, the project will utilize BWP's existing MPP facility, as noted previously, which is located at 110 Magnolia Blvd., Burbank, CA, 91502. Existing electrical connections on site at the MPP are already designed to support output capacities targeted under the project (including under the combined project, should CEC choose to fund both Burbank applications). All needed grid tie / interconnection lines to the power grid and to BWP's / SCPPA's systems are already in place. Moreover, as an upgrade to an existing facility, construction activities and associated costs will be limited, greatly reducing the total project deployment cost on a per megawatt basis.

During operation, the proposed system will help to alleviate existing peak period resource import constraints by producing load following / dispatchable, high-efficiency electricity. Operationally, BWP will seek to optimize system output to meet the combined needs of SCPPA members and CAISO. Additionally, by incrementally reducing BWP, SCPPA, LADWP, and CAISO reliance on lower-efficiency peak power production via single cycle turbines, the project will support a net GHG emissions reduction of up to 30,529 metric tonnes of carbon dioxide equivalent emissions per year (MT CO2e/yr) in greenhouse gas (GHG) emissions

0.3 Operational Goals and Objectives

Overarching **goal** of the project is to design, procure, construct/install, and commercially operate the proposed advanced gas pathway system at the existing MPP site. The project will achieve this goal through the following **objectives**:

1. Design and engineer the proposed advanced gas pathway system upgrade, sufficient to increase system capacity by 24.0 MW, for installation at BWP's MPP; the system will comply with all federal, state, and local laws and will be compatible for operation under CAISO rules and requirements.
2. Complete all permitting and environmental compliance requirements
3. Procure and construct proposed system
4. Commission the installed system, including confirmation of system operability, system level verification, ability to dispatch to BWP distribution, SCPPA, and CAISO
5. Complete 12 months of operational data collection, including system power output, emissions rates, hourly/daily/monthly energy exported, and other key parameters
6. Validate and verify a full range of system operability based data; key metrics to be evaluated will include:
    a. Confirm system provides an output capacity improvement of 24.0 MW,
    b. Verify an increase in capacity factor from 70-75% at present to approximately 89% under the project
    c. Confirm ability to provide power capacity that could increase islanded power production, in the event of a CAISO- or other grid-down event
    d. Confirm via testing that the system operates in compliance with all CAISO requirements, to support CAISO dispatchable power / resource adequacy applications

e. Quantify local grid congestion reductions by tracking amount of system-produced power placed onto BWP's distribution grid and dispatched to SCPPA members

7. Offset at least 30,529 MT CO2e/yr during full system operation
8. Improve reliability for disadvantaged / underserved communities located within BWP's and SCPPA members' respective service areas by alleviating distribution system strain
9. Support statewide / CAISO system resiliency and operability by providing new power production capacity that can be leveraged by CAISO for resiliency, operability, or resource adequacy.

0.4 Implementation / Execution of Goals and Objectives Through the Scope of Work

The project, as proposed, will be sufficient to achieve all targeted goals and objectives identified in Section 0.3 above. Briefly, the project will include all engineering, design, and permitting needed to initiate the project. It will also include procurement and construction/installation of the proposed system and all required appurtenances. Following commissioning, BWP will operate and validate system operation for a period of 12 months. During this period, BWP will test and verify the efficacy of all targeted system operational parameters, including capacity, emissions benefits, and all resiliency outcomes and benefits described above. The project's scope of work will also ensure that project benefits are targeted to DACs, wherein the proposed facility will serve multiple DACs located within BWP's and SCPPA members' service areas, while also providing resiliency, GHG emissions reduction, and grid management improvements within this area.

1.0 STATEMENT OF FINANCIAL NEED

1.1 Existing and Anticipated Revenue Streams

Relevant to its electric utility system, Table 1 summarizes BWP revenue streams for fiscal years ending in 2020 to 2022 (in $1,000)—the most current financial statements available. As shown, BWP relies on revenues derived primarily from retail sales, and to a lesser extent wholesale sales and other revenues.

Revenue Category	FY 2019-2020	FY 2020-2021	FY 2021-2022	Average
Operating Revenue: Retail	$158,024	$149,846	$154,304	$154,058
Operating Revenue: Wholesale	$15,442	$42,088	$21,486	$26,339
Other Revenues	$7,180	$8,946	$6,600	$7,575
Total Revenues	**$180,646**	**$200,880**	**$182,390**	**$187,972**
Table 2. BWP revenue streams, 2021 to 2023 ($1000s)				

1.2 Access to Feasible Project Financing

BWP has acquired access to project funding through SCPPA, as discussed and detailed in SCPPA's attached commitment letter. As a SCPPA member, BWP is eligible to receive such funding as appropriate to complete upgrades to its MPP system, wherein the MPP facility provides power via SCPPA to SCPPA's member agencies. The budget / cost estimates provided in support of this project were, moreover, developed based on direct, system-specific input and a preliminary proposal provided by GE to BWP. Therefore, the required cost estimates are considered to be reasonably reliable. SCPPA's funds are, however, constrained beyond the ask identified under

the project. Moreover, providing a balanced financing structure is key to BWP's ability to maintain affordable rate structures for the communities that it serves. Burbank residents—particularly those neighborhoods classified as DACs—rely on BWP to maintain affordable rate structures. Also, despite strong annual revenues, ongoing expenses for general operations, as well as replacement of ageing equipment and response to increasingly common major weather events have strained BWP's ability to invest in capital to support improved resiliency. Other SCPPA member agencies served by the MPP also face similar constraints.

These financial constraints limit BWP's ability to fully execute the proposed system. Absent funding from the Energy Commission, BWP would be required to either not proceed on the project, or acquire funding from sources that will, ultimately, directly impact ratepayers to an extent that could be difficult for underserved ratepayers to bear. For example, alternate options available to BWP include increasing utility rates, or targeting bond funding or other debt-based funding, including such funding which may be available through SCPPA. The Energy Commission's investment, in contrast, will help BWP avoid rate increases while still meeting sustainability and reliability targets, and providing direct benefit to CAISO operation.

2.0 CONTRIBUTION TO RELIABILITY

2.1 Project Capacity and Timing of Operation

As noted previously, the project will install the proposed system upgrade, which will provide up to 24.0 MW / 187,114 MWh/yr of power production capacity.

The proposed system upgrades will be operated consistent with the existing operational parameters of the MPP, except that **additional capacity would be made available at any time when the MPP is operational**. Additional project derived capacity would be called upon to provide electricity under multiple use cases, wherein the specific reasons for calling additional capacity will likely vary seasonally and/or daily. Generally, timing of operation will be determined based on peak power demand, either locally within BWP's system, via SCPPA (see Table 3 for (maximum) entitlement shares of the MPP, by SCPPA member), or CAISO. Project capacity will also support each of the operational goals and objectives described under Section 0.3, and these needs could also result in spin-up of the proposed system.

Participant	MPP Entitlement Share Percentage
Anaheim	38.0165%
Burbank	30.9917%
Cerritos	4.2%
Colton	4.1322%
Glendale	16.5289%
Pasadena	6.1307%
Totals	**100%**

Table 3. Entitlement share (maximum) of MPP power output by SCPPA member agency.

During the 12-month operational period, BWP will complete testing and validation for the proposed system upgrades, and will establish an optimized operating regime that supports balanced benefits to CAISO and to BWP's + SCPPA members' own distribution systems, as described in this proposal.

2.2 Grid Reliability Improvements During Peak Load

The project will enable both CAISO and SCPPA members to utilize the proposed capacity increases to support peak load demand across their respective systems. Herein, CAISO would be responsible for scheduling power dispatch from the system; CAISO makes capacity calls on a 5-minute basis to each of the entitlement share allocations identified in Table 3, and would leverage this process to capture on-call peak power production from the project. Thus, in total, up

to the proposed project's capacity increase above and beyond existing system operation could be made at any time / as needed to support peak load demand.

2.3 Nameplate / Power Output Capacity Increases and Restoration of Ambient Derates Due to High Temperature

The project will provide up to 24.0 MW of new power output capacity. This new capacity will be allocated as described in Section 2.1. Moreover, as described in Section 0.2, the proposed project upgrades would be designed and deployed so as to help alleviate power output deratings during hot inclement weather. While some degree of derating would nonetheless occur, up to the full capacity of the system's upgrade output could be put to use to offset high temperate derates. More generally, BWP will have flexibility to allocate all or a portion of this new capacity for improved management / resiliency of its own distribution system as needed, for the use cases described above in Sections 2.1, 2.2, and 0.3.

2.4 Leverage of the Existing Interconnection

As described in Section 0.2, the project will leverage BWP's existing CAISO grid interconnection point and its interconnection with SCPPA, which are located at its existing MPP facility. No modification to this interconnection point will be required, thereby minimizing capital costs for the project.

2.5 Extent to Which Project Capacity Will Be Committed to Resource Adequacy or Similar

One hundred percent (100%) of the proposed project's new capacity will be available to support the combined resource adequacy needs of SCPPA members (including BWP) and CAISO. Moreover, BWP will confirm via testing that the system operates in compliance with all CAISO requirements (see Section 6.0), to ensure that the system will support CAISO dispatchable power / resource adequacy applications

2.6 Load Service Through Bulk Transmission

The project will not directly support load service through bulk transmission within BWP's purview. For portions of the system's generation capacity under CAISO control, however, CAISO would have the option to utilize the system to manage its transmission system requirements, for example by offsetting the amount of transmission capacity needed to provide power in the region where the proposed system is located.

2.7 Performance During Emergency Events

The proposed upgrade system will provide several options to support improved performance and resiliency / reliability during emergency events, by providing up to its full capacity / output of resilient supply under various emergency events. Examples include the following:

- ***Partial loss of power supply.*** In the event of a partial supply loss, the proposed system could be used to provide additional temporary power to offset lost generation or reduced grid power available within BWP's system and/or to SCPPA members.
- ***Loss of grid connectivity.*** In the event that power is no longer available to BWP through the external grid, BWP's grid is capable of islanded operation, to the extent that it has sufficient power generation capacity to meet demand in its service area. Output capacity available through the proposed system upgrades will provide additional power supplies within BWP's service area to support increased resilience and improved power supply in the event of lost external grid connectivity.

3.0 PROJECT READINESS AND WORKPLAN

3.1 Project Schedule and Timeline Justification

The project team will execute the project according to the schedule shown in the following Gantt chart. As shown, the project team will complete the project within 36 months, starting in June 2024 and ending no later than June, 2027, consistent with CEC requirements (Figure 3). This proposed schedule allows sufficient time for completion of the project, and would also allow for completion of a sister deployment designed to further increase output capacity of the proposed system (see separate BWP application to the Energy Commission). The proposed schedule aligns with preliminary engineering evaluations completed to date, and with a preliminary proposal received from GE for the proposed upgrades. Moreover, BWP has included sufficient buffer time to provide schedule flexibility, in the event that it is needed.

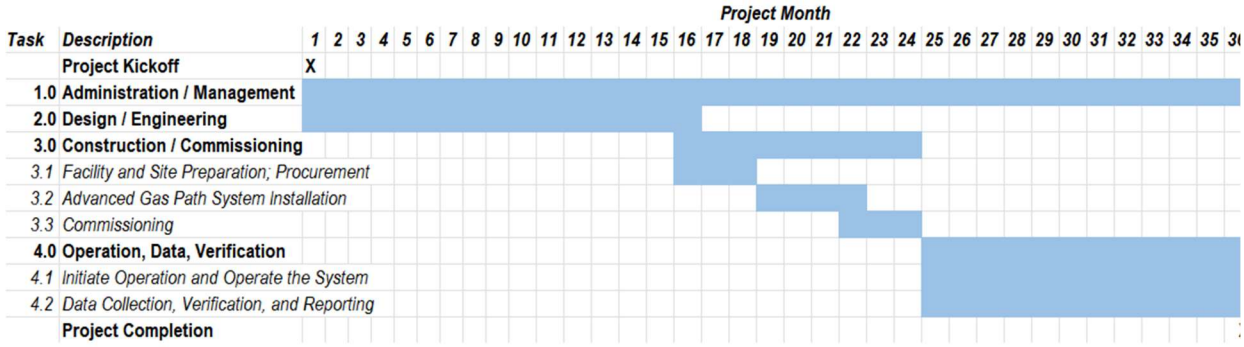

Figure 3. Project Gantt chart.

3.2 Approach to Performing the Work

The project team will follow a standard process for execution that will include engineering / design, followed by procurement and construction, in accordance with BWP's standard process. BWP has already identified GE as the proposed technology / system provider. This decision was made based on the existing technology available on site, which is a GE-brand gas turbine. Design as relevant to the proposed system upgrades funded by this grant project will focus on the specific elements needed to for installation of the proposed advanced gas pathway system, and full integration with BWP's existing control system.

Once design is complete, GE will complete all site preparation, and install all proposed equipment so as to minimize downtime. Presently, GE is estimating a total offline time of 94 days. Following completion of the installation process, GE and BWP will commission the system and all components. Upon successful completion of commissioning, BWP will initiate operation of the project and complete 12 months of data collection, pursuant to the discussion provided in Section 2.0, and in accordance with the Measurement and Verification (M&V) plan provided in Section 5.0.

3.3 Project Tasks and Subtasks

The project will include the following tasks and subtasks; refer to the attached Scope of Work for additional information.

- **Project Administration and Management (Task 1):** The Recipient will complete all needed bids, contractor selection, contracting, budget and schedule tracking, progress tracking, milestone tracking, and all other day to day project administration and management activities. The Recipient will also complete all CEC-required deliverables and documents / products under this activity.

- **System Design, Engineering, and Permitting (Task 2):** The Recipient will oversee the completion of all system design and engineering, which will include limited engineering and design required for integration of the proposed gas path system with the existing combined cycle gas turbine. Permitting will be included in this activity, wherein permitting activity will be limited to modification of the facility's existing air permits. This task will also include CEQA compliance, wherein the Recipient will work to supply needed information to the Energy Commission—the lead agency—to support completion of the CEQA process. (Task 2).

- **System Construction and Commissioning (Task 3):** The Recipient and its contractors will oversee the procurement and construction of the proposed system. Briefly, within the boundary of this grant application, the Recipient's contractor will complete procurement of the proposed advanced gas pathway equipment, then complete all needed site preparation needed for the installation process (Subtask 3.1). Site preparation requirements are anticipated to be limited in scope, but will be determined during the final design process under Task 2. Once site preparation is complete, the Recipient will shut down the facility, then the Recipient's contractor will install the proposed advanced gas path system (Subtask 3.2) and all appurtenances in accordance with system design and engineering completed under Task 2. Once installation is completed, the Recipient and its contractor engineering team will oversee commissioning of the system to ensure its operability in accordance with targeted standards and metrics (Subtask 3.3). Although funded separately, if the Recipient also receives Energy Commission funding for the compressor upgrade project, the Recipient and its contractor will complete upgrades proposed under that sister scope of work concurrent to the advanced gas path system procurement, installation, and commissioning process.

- **Data Collection, Measurement & Verification, and Reporting, Including Benefits Reporting (Task 4):** The Recipient will operate the project for a period of 12 months. During that time, the Recipient will operate the system according to multiple use cases as discussed in the project narrative for this grant application. The Recipient will also collect data and document all outcomes and claims made in the narrative proposal, through a formal measurement and verification process, as described therein. Analysis will include a review of achieved (quantified) GHG and other pollutant emissions reductions, along with benefits related to resource adequacy, resiliency, community benefits, improved renewables management, and other key system benefits. This analysis will be incorporated into the project's final report for the CEC.

3.4 Project Location

The project will be located at the existing Magnolia Power Plant, 110 Magnolia Blvd., Burbank, CA, 91502. This existing facility includes the current MPP system, an existing, combined cycle, natural gas fired power generation facility, with a current output capacity of 247.4 MW at full load. The project will leverage the existing facility's turbine and generator systems, controls system, controls and administration / operation buildings, grid tie in lines, and physical land area to support the project.

3.5 Permits and Environmental Compliance

Permitting requirements for the project will include an amendment to the facility's current Title V permit to operate from the South Coast Air Quality Management District (SCAQMD) and an amendment to the facility's California Energy Commission (CEC) Conditions of Certification. For

the proposed modifications, the CEQA process will be performed as part of amending the CEC conditions of certification. The CEC will also serve as the lead agency for CEQA. While BWP reached out to the CEC to confirm this role, CEC was unable to respond because the application period for this grant application was already underway. Nonetheless, based on input provided by BWP's environmental compliance team, given that the project will not require any ground disturbance and will target increases to power production through upgrade of the existing turbine system, we anticipate that an Initial Study / Mitigated Negative Declaration (IS/MND) will be sufficient to complete CEQA compliance. CEC will, of course, confirm or amend this outcome during the project period. Moreover, if BWP is able to deploy both the project and the project identified in its sister grant application to CEC, both upgrades would be considered under the same CEQA / permitting process. Refer to the CEQA Compliance Form for additional details.

3.6 Interconnection Studies and Approvals Needed to Initiate Operations

Based on preliminary engineering work and evaluations completed to date, the project will not require additional interconnection studies prior to initiation of operation. The system will require CAISO testing during the commissioning process, to verify system operability and operational parameters. But BWP will otherwise utilize existing grid connections. No additional interconnection studies or approvals are required

3.7 Risks, Barriers, and Other Factors Relevant to Project Completion

Key risks, barriers, and mitigating factors relevant to the project include the following:

- Schedule performance risk. Due to unforeseen factors, such as procurement delays or engineering or construction management delays, the project could be delayed and targeted milestone dates could be missed. Mitigation: BWP has developed the proposed project schedule based on reasonable engineering, procurement, and construction / commissioning timeframes, as relevant to the proposed system. Moreover, BWP has included several months of buffer time within the schedule to account for and effectively handle potential unforeseen delays during the development and execution process.
- Cost performance risk. Project cost may exceed expectations; the proposed equipment may be subject to variable costs. Mitigation: BWP has already retained GE to complete an evaluation of the system for upgrade, and has already acquired a preliminary proposal for the proposed upgrade. This proposal was developed consistent with those identified costs, and the full GE proposal can be made available to the CEC upon request.
- Testing constraints for demonstration of proposed emergency support / services. BWP recognizes that an emergency event that could trigger need for islanding within BWP's system may not occur during the 12-month demonstration window. Mitigation: BWP has identified procedures in its Measurement and Verification plan to test these elements even without an emergency event.

4.0 CLIMATE AND AIR QUALITY REQUIREMENTS

4.1 Required GHG and Emissions Reporting; GHG Emissions Benefits

GHG emissions were evaluated based on the increase in power generation from the MPP's combined cycle power plant, by comparing its updated heat rate (Btu/kWh) under the project, to a peaker plant (simple cycle gas turbine) operated by BWP that would have likely generated the same power in the absence of the MPP upgrade.

Under the project, the proposed increase in generation output at MPP would be utilized during times of peak energy, when alternative energy sources (i.e. wind and solar) are not available. During this time, it is likely that peaking plants would run to provide the additional power needed

on the grid. Moreover, peak power production could be called up by BWP, SCPPA members, and/or CAISO.

Based on these assumptions / determinations, BWP calculated that the upgraded MPP would require only 6,614 Btu/kWh compared to 11,030 Btu/kWh for a typical peaker plant, meaning that MPP would use 4,416 Btu less for each kWh generated from the MPP system upgrade. Considering that the MPP upgrade would generate 187,114 MWh more power per year, that would equate to annual decrease of natural gas usage, in comparison to the baseline scenario described above, to avoid GHG emissions of approximately 30,529 MT CO2e with the plant upgrade. Key factors for this determination include:

1. MPP heat rate of 6,614 Btu/kWh provided by GE.
2. Typical Peaker plant heat rate of 11,030 Btu/kWh provided by EIA: https://www.eia.gov/electricity/annual/html/epa_08_02.html.
3. Annual Electricity Production Increase Provided by MPP staff.
4. GHG CO2e Emission factor of 53.11 kg CO2e/MMBtu for natural gas combustion emissions and associated conversions obtained from EPA, specifically Tables A-1, C-1 and C-2 from 40 CFR Part 98.

Table 4 summarizes the total GHG emissions reductions / offsets that would result from project operation per year.

Pollutant	Annual Emissions Reduction
CO_2	30,529 MT CO2e/yr
Table 4. Emissions avoided as a result of project deployment per year	

4.3 Air Permit Modifications

Permitting requirements for the project will include an amendment to the facility's current Title V permit to operate from the South Coast Air Quality Management District (SCAQMD) and an amendment to the facility's California Energy Commission (CEC) Conditions of Certification. See also Section 3.5.

5.0 PROJECT BUDGET AND COST EFFECTIVENESS

5.1 DEBA Funding per MW of Incremental Rated Capacity

In total, the project will expend $12,755,466 in Energy Commission funding to provide 24.0 MW of new incremental rated capacity. This is equivalent to $12,755,466 / 24.0 MW = $531,477 per MW of new incremental rated capacity.

5.2 Documented and Secured Match Funding

SCPPA, on behalf of BWP, has committed to providing a total of $14,000,000 in total match funding, equivalent to a 52.3% cost share, for a total project cost of $26,755,466. Cost share will be provided as follows: $377,166 to be provided to offset direct labor and fringe benefits costs to be incurred by BWP staff, $92,300 in cash match for equipment rentals during construction, and $13,530,534 to be provided as additional cash match to support subcontracting and equipment purchase under the project. Refer to the attached commitment letter from SCPPA, which includes the total match share commitment for the project.

5.3 Financial Ability to Execute and Operate the Project

BWP is financially salient and has the financial ability to execute and operate the project. With an extensive history, BWP consistently provides reliable service within its service area. Moreover,

as discussed in Section 2, BWP maintains a viable balance between cash flow and expenses, and with support from SCPPA, will have sufficient cash in hand at present to provide all cost share requirements for the project.

5.4 Project Risks and Mitigation

Refer to Section 3.7 for a discussion of project risks and mitigation. Additionally, in the unlikely event that BWP's cost share becomes available, SCPPA has identified a source of backup funds for the project to support the CEC-required cost share, wherein SCPPA would make funds available through a combination of current project reserves, future revenue collections, and/or financing.

5.5 Reasonableness of the Budget

BWP has designed the proposed budget to be highly reasonable. Briefly, BWP requests $12.8 million in CEC funds to design, procure, build, commission, and validate / operate the proposed system upgrade, as described previously. BWP, with support from SCPPA, will match these funds with $14.0 million in local match. Moreover, BWP is not charging overhead or indirect to the grant or as cost share. Most importantly, BWP proposes to deeply leverage its existing facilities to support the project, meaning that CEC's relatively small investment will result in a disproportionately large outcome in terms of new MW online within BWP's service area. Please refer to the attached Budget Form for a summary of the proposed budget.

6.0 REPORTING AND MEASUREMENT AND VERIFICATION PLAN

Under the project, BWP will execute the following Measurement and Verification (M&V) Plan, which provides for both ***performance evaluation during a simulated or actual emergency event***, and ***emergency performance reporting***, as well as verification / validation of all relevant claims made within this proposal.

BWP will be responsible for and will oversee all data collection and reporting. Except as specified below, data collection will be performed through BWP's control system, which will be updated to integrate the proposed turbine system upgrades as an element of the project. The control system will automatically collect daily and hourly data by default. Minute by minute data collection can also be optionally captured. Data collected will be analyzed and evaluated, then reported out to the Energy Commission in quarterly reports and during one final report (refer to the Scope of Work). To this end, BWP will execute the following M&V Plan during the 12-month operational period; for convenience, the M&V Plan is organized to align with the project objectives identified in Section 0.3.

- **Objective:** Design and engineer the proposed advanced gas pathway system upgrade, sufficient to increase system capacity by 24.0 MW, for installation at BWP's MPP; the system will comply with all federal, state, and local laws and will be compatible for operation under CAISO rules and requirements. **Measurement and Verification:** BWP will measure and verify output capacity, as installed, during the commissioning process. Additionally, CAISO will complete a capacity check and certification (Pmax) at the point of delivery, immediately prior to the initiation of operation. BWP will request the certification outcomes / results from CAISO and report to the CEC.

10. **Objective:** Commission the installed system, including confirmation of system operability, system level verification, ability to dispatch to BWP distribution, SCPPA, and CAISO. **Measurement and Verification:** GE under supervision of BWP will complete the commissioning process to verify all system operational parameters, to support operation of the facility to supply power to BWP's service area, and to SCPPA members and CAISO.

Moreover, CAISO will complete a certification process near the end of system commissioning, prior to the initiation of full operation. During this process, CAISO will confirm the systems operation including system operability, system level verification, and verify CAISO interconnection. BWP will collect results from these tests and report to the CEC.

- **Objective:** Complete 12 months of operational data collection. **Measurement and Verification:** BWP will collect at minimum hourly data on the following parameters, at minimum: system power output, emissions rates, hourly/daily/monthly energy exported, and other key parameters determined to be relevant by BWP or CEC. Additionally, while CAISO's and BWP's dispatch systems will log hourly by default, BWP's control system will also be capable of logging most measurements on a minute by minute basis. If needed / as warranted, BWP will, at its own discretion, also download these additional detailed data to understand and verify / validate system operation.
- **Objective**: Validate and verify a full range of system operability as follows; BWP will report all outcomes to the CEC:
    - Confirm system provides an output capacity improvement of 24.0 MW. **Measurement and Verification:** These outcomes will be verified during the commissioning process, as described above.
    - Verify an increase in capacity factor from current (70% to 75%) to approximately 89%. **Measurement and Verification:** These outcomes will be preliminarily verified during the commissioning process, during a preliminary operation period, then will be verified in full detail via ongoing data colleciton during the proposed 12-month data collection period. These data will be reported to CEC during quarterly M&V reporting.
    - Confirm ability to provide power capacity that could increase islanded power production, in the event of an external grid-down event. **Measurement and Verification.** In the event that a grid down event occurs during the 12-month operational data collection period, BWP will track all power produced by the system for use within its service area and/or within SCPPA member services areas, then report out those amounts to the CEC. If not grid down event occurs, BWP will verify the facility's ability to dispatch electricity directly to BWP's own distribution grid, up to the total amount provided by the proposed project expansion. Moreover, BWP will collaboratively evaluate and consider, in coordination with the Energy Commission, other reasonable potential processes for providing further emergency system validation in the event that a grid down event suitable for testing may not otherwise occur.
    - Confirm via testing that the system complies with all CAISO requirements, to support CAISO dispatchable power / resource adequacy applications. **Measurement and Verification.** Again, CAISO and the project team will complete a series of tests including Pmax, Pmin, regulation up, and down, wherein CAISO takes control of the system, then increases and decreases the output to verify CAISO control. CAISO will measure multiple parameters including but not limited to the ramp rate and response time. CAISO will also verify that they can call on the system to start successfully providing power within applicable time requirements, and verify all other CAISO requirements. BWP will gather results from CAISO and report to the CEC.

- Quantify BWP's and SCPPA's grid congestion reductions by tracking amount of system-generated power placed onto BWP's distribution grid. **Measurement and Verification.** BWP will track the amount of power placed onto BWP's grid and routed to SCPPA members from the project, measured at the point of delivery.

- **Objective:** Offset at least 30,529 MT CO2e/yr during full system operation. **Measurement and Verification.** BWP will track the daily, monthly, and annual power production from the project, and compare to historic periods to identify net GHG and other emissions reductions. BWP will collect these data and report to the CEC.

11. **Objective:** Improve reliability for disadvantaged / underserved communities located within BWP's and SCPPA members' respective service areas by alleviating distribution system strain. **Measurement and Verification.** BWP will track power discharged from the project onto BWP's power grid, and to SCPPA members. During peak periods, all power dispatched during these periods will alleviate distribution system strain, thereby improving reliability for DACs served in these areas. BWP will collect these data and report to the CEC.

ATTACHMENT 4
Scope of Work

The Recipient proposes the following Scope of Work to support and ensure execution of the project.

1.0 Task List.

The following table summarizes the task numbers and names for the project, including subtasks as applicable.

Task or Subtask No.	Name
1.0	**Project Administration and Management**
2.0	**System Design and Engineering, Permitting**
3.0	**System Construction and Commissioning**
3.1	*Facility and Site Preparation, and Procurement*
3.2	*Advanced Gas Path System Installation*
3.3	*System Commissioning*
4.0	**System Operation and Data Collection / Verification**
4.1	*Initiate Operation and Operate the System*
4.2	*Data Collection, Verification, and Reporting, including Benefits Reporting*

2.0 Activities.

Project activities align closely with the tasks identified in Section 1.0. Herein, the Recipient will complete the following activities:

- **Project Administration and Management (Task 1):** The Recipient will complete all needed bids, contractor selection, contracting, budget and schedule tracking, progress tracking, milestone tracking, and all other day to day project administration and management activities. The Recipient will also complete all CEC-required deliverables and documents / products under this activity.

- **System Design, Engineering, and Permitting (Task 2):** The Recipient will oversee the completion of all system design and engineering, which will include limited engineering and design required for integration of the proposed gas path system with the existing combined cycle gas turbine. Permitting will be included in this activity, wherein permitting activity will be limited to modification of the facility's existing air permits. This task will also include CEQA compliance, wherein the Recipient will work to supply needed information to the Energy Commission—the lead agency—to support completion of the CEQA process. (Task 2).

- **System Construction and Commissioning (Task 3):** The Recipient and its contractors will oversee the procurement and construction of the proposed system. Briefly, within the boundary of this grant application, the Recipient's contractor will complete procurement of the proposed advanced gas pathway equipment, then complete all needed site preparation needed for the installation process (Subtask 3.1). Site preparation requirements are anticipated to be limited in scope, but will be determined during the

final design process under Task 2. Once site preparation is complete, the Recipient will shut down the facility, then the Recipient's contractor will install the proposed advanced gas path system (Subtask 3.2) and all appurtenances in accordance with system design and engineering completed under Task 2. Once installation is completed, the Recipient and its contractor engineering team will oversee commissioning of the system to ensure its operability in accordance with targeted standards and metrics (Subtask 3.3). Although funded separately, if the Recipient also receives Energy Commission funding for the compressor upgrade project, the Recipient and its contractor will complete upgrades proposed under that sister scope of work concurrent to the advanced gas path system procurement, installation, and commissioning process.

- **Data Collection, Measurement & Verification, and Reporting, Including Benefits Reporting (Task 4):** The Recipient will operate the project for a period of 12 months. During that time, the Recipient will operate the system according to multiple use cases as discussed in the project narrative for this grant application. The Recipient will also collect data and document all outcomes and claims made in the narrative proposal, through a formal measurement and verification process, as described therein. Analysis will include a review of achieved (quantified) GHG and other pollutant emissions reductions, along with benefits related to resource adequacy, resiliency, community benefits, improved renewables management, and other key system benefits. This analysis will be incorporated into the project's final report for the CEC.

3.0 Timetable

The Recipient will complete the proposed project over a period of 36 months, as shown in the Gantt table below. Note that if the Energy Commission chooses to fund both this project and the complementary gas turbine compressor project, the schedules for both projects will be aligned to be completed concurrently, so as to minimize system downtime. Anticipating a start date of June, 2024, all project activities would be complete no later than June, 2027.

		Project Month																																	
Task	Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
	Project Kickoff	X																																			
1.0	Administration / Management																																				
2.0	Design / Engineering																																				
3.0	Construction / Commissioning																																				
3.1	*Facility and Site Preparation; Procurement*																																				
3.2	*Advanced Gas Path System Installation*																																				
3.3	*Commissioning*																																				
4.0	Operation, Data, Verification																																				
4.1	*Initiate Operation and Operate the System*																																				
4.2	*Data Collection, Verification, and Reporting*																																				
	Project Completion																																				X

4.0 Task Products

The Recipient will deliver the following task products:

- **Task 1.0. Project Administration and Management:**
  - All CEC-required administrative products, including the following:
    - Bimonthly status updates (emailed summary to CAM every two months plus a follow up call with the CAM to discuss project status updates).
    - Quarterly invoicing (using CEC's template invoice spreadsheet).

        - Measurement and Verification Reports (annual measurement and verification data and performance reports on the project according to a measurement verification plan approved by the CAM; note that the final M&V report will include a technical evaluation of the project outcomes and is discussed and considered in additional detail under Task 4).
        - Final report (draft and final)
    - Notification of Selection of Contractors for all engineering, procurement, and / or construction contractors to be selected under the project.
    - Notification of Completion of all contracting

- **Task 2.0. System Design and Engineering, Permitting**
    - Notification of Completion of Final System Design
    - Build-Ready Engineering Cover Sheet
    - Procurement List
    - Final Permitting Documentation / CEQA completion (Certification / approval notice for the completed CEQA document, assumed to be an IS/MND completed through the Energy Commission)

- **Task 3.0. System Construction and Commissioning**
    - Construction plan (Subtask 3.1)
    - Notification of initiation of site construction (Subtask 3.1)
    - Notification of completion of site preparation (Subtask 3.2)
    - Construction report (Subtask 3.2)
    - Commissioning Plan (Subtask 3.3)
    - Commissioning Report (Subtask 3.3)

- **Task 4.0. Advanced Gas Path System Operation and Data Collection / Verification**
    - Notification of Initiation of System Operation (Subtask 4.1)
    - Quarterly Operational Data and Verification Reports, (4 total; Subtask 4.2) with Benefits and Measurement and Verification Reporting as required by the Energy Commission (Subtask 4.2)

5.0 Administrative Tasks

Please refer to Section 4.0, under the Task Products list for Task 1.0.

6.0 Summary Table

Name of Applicant: Burbank Water and Power / City of Burbank
Proposal Title: City of Burbank Magnolia Power Project: Advanced Gas Path Resiliency Upgrade

Tasks	Activities	Timetable in months	Product(s)/ Deliverable(s)
Task 1. Project Administration and Management	Complete all required administration and reporting activities; also complete all contracting and contractual agreements	M1 to M36	All CEC-required products: bimonthly status updates, quarterly invoicing, M&V reports, Final Report (draft and final), Notification of Selection

ATTACHMENT 4
Scope of Work

Tasks	Activities	Timetable in months	Product(s)/ Deliverable(s)
			of Contractors, Notification of completion of all contracting
Task 2. System Design and Engineering, Permitting	Complete all system design, engineering, and permitting	M1 to M16	Notification of Completion of Final System Design; Build-Ready Engineering Cover Sheet; Procurement List; Final Permitting Documentation / Notification of CEQA completion
Task 3. System Construction and Commissioning	Complete all procurement, construction, and commissioning for the project	M16 to M24	Construction plan; Notification of initiation of site construction; Notification of completion of site preparation; Construction report; Commissioning Plan; Commissioning Report
Task 4. System Operation and Data Collection / Measurement and Verification	Initiate operation. Then operate the system for a period of 12 months to support all measurement and verification activities; collect and analyze data during this period and verify all outcomes.	M25 to M36	Notification of Initiation of System Operation; Quarterly Operational Data and Verification Reports, with Benefits Reporting (4 total)