Climate Pollution Reduction Grants – Implementation Grants

Workplan for Salt Lake City Combined Heat and Power Project

# Overall Project Summary and Approach *(45 possible points)*

The combined heat and power system, also known as cogeneration, is an efficient, clean, and reliable method of converting biogas (a byproduct of the anaerobic digestion process) to electrical power and thermal energy needed for the treatment process.

The scope of the Salt Lake City Combined Heat and Power project will encompass the design and construction of a new combined heat and power facility which includes the procurement and installation of two high efficiency gas engine units, electrical improvements to support the new power generation system, and connecting the electrical power produced into the new 13.8 kV plant electrical distribution system being constructed as part of the Salt Lake City Water Reclamation Facility Nutrient Project. The electrical improvements to be included in the scope of the project includes the following:

* Procurement and installation of two 4,160 V generators
* Procurement and installation one paralleling switchgear
* Procurement and installation One electrical transformer
* Design and construction of electrical duct banks (approximately 750 feet)
* Design and construction of the low voltage power distribution system
* Design and construction of Programmable Logic Controllers (PLCs)
* Design and construction of new electrical building

The Salt Lake City Department of Public Utilities collects and treats wastewater from residential and industrial sources within Salt Lake City. Wastewater is currently treated at the Salt Lake City Water Reclamation Facility to meet effluent discharge limits stipulated in Utah Pollution Discharge Elimination System (UPDES) Permit UT0021725. Treated effluent is discharged into the Northwest Canal which flows into the Great Salt Lake. The existing Salt Lake City Water Reclamation Facility was constructed in the mid-1960s and has undergone various upgrades and expansions since the original construction. The Salt Lake City Water Reclamation Facility is currently rated to treat fifty-six million gallons per day (mgd). The existing treatment processes at the Salt Lake City Water Reclamation Facility includes screening, grit removal, influent pumping, primary clarification, trickling filters, activated sludge, secondary clarification, and chlorine disinfection. The solids, also known as sludge, are treated in anaerobic digesters and dewatered mechanically producing Class B biosolids. Biosolids are applied on local agriculture lands as fertilizer to improve and maintain productive soils and stimulate plant growth.

The existing Salt Lake City Water Reclamation Facility is being upgraded in order to comply with new water quality standards and support forecasted population growth in the region. The existing treatment process is being replaced with a new biological nutrient removal (BNR) process. Salt Lake City is currently flaring off the biogas produced through the anaerobic digestion process rather than converting it to electrical power and thermal energy. The proposed Salt Lake City Combined Heat and Power project will reduce greenhouse gas emissions and reduce the amount of electricity that the Salt Lake City Water Reclamation Facility needs to pull from the power grid.

This will be accomplished by utilizing the inexhaustible renewable biogas generated from the anaerobic digestion process to produce approximately one megawatt per hour (MWh) of electrical power and heat that will also contribute toward energy security and independence. Utilization of the inexhaustible renewable biogas source with the new combined heat and power system will emit less carbon dioxide compared to conventional power sources. The electrical power and thermal energy produced from the combined heat and power system will be utilized onsite at the Salt Lake City Water Reclamation Facility offsetting the need to import electrical and thermal power for the treatment process.

1. **Description of GHG Reduction Measures** *(20 possible points)*

Baseline Scenario

Currently all digester gas (methane) produced through the treatment process is being flared (burned off). This is an inefficient use of the methane gas that is a renewable resource that could serve as an alternative energy source for Salt Lake City. Electrical power is currently purchased from Rocky Mountain Power to meet the full energy needs for the wastewater treatment process. The electrical power and thermal energy that will be produced from the combined heat and power project will be used to offset a portion of the electrical power that needs to be purchased from Rocky Mountain Power for the new treatment process.

The emissions modeled in the baseline scenario include those from the combustion of digester gas in the flare, very minor fugitive release of methane in the unburned digester gas, and the production of electricity at the power plant.

Proposed New Scenario

In alignment with the Priority Climate Action Plan, the Project will contribute to the Salt Lake City goal to achieve 100% of the City’s municipal electricity from renewable sources by 2030.

The electricity produced by the digester gas used in the new system will reduce the power demand provided by Rocky Mountain Power grid electricity system. It is assumed that one engine will operate full time (24/7/365) through 2030 and then two engines operate full time at 60% capacity after 2030. The power output of each of the two engines is 847 kW, after 2030, the two engines combined would produce 1,016 kW to fully utilize the methane gas available. The new heat and power system will replace the need for flaring but will have GHG emissions equivalent to that of the existing flare combustion. Electricity produced by the new system will offset the amount of electricity needed to be purchased from Rocky Mountain Power, thereby substantially reducing emissions. Additionally, there would be a reduction of other air pollutant emissions, as discussed in section 3.

Benefits

This project will allow for the beneficial use of digester gas to produce electricity and heat, as compared to the current situation where that energy is wasted, and the gas is destroyed in a flare. Mitigation of climate change, and achievement of the 1.5°C or even a WB2°C scenario, will require the employment of all available options to avoid and remove GHG from the atmosphere. Naturally conservation and efficient use of resources should be accomplished before considering new generation of low-carbon electricity or implementation of other technical options. This project will thus reduce the generation of grid-supplied electricity by 3rd parties, and therefore make new renewable generation options available to other consumers. In addition, the combined heat and power process will be a cleaner burning system as compared to the flares, thus reducing emissions of criteria and toxic air emissions, and improving air quality in the degraded Salt Lake City airshed.

1. **Demonstration of Funding Need** *(10 possible points)*

Salt Lake City is the most populous municipality in the State of Utah, and one in six residents live below the poverty line. The city experiences pockets of economically stressed residents, and the Salt Lake City Water Reclamation Facility takes specific steps to ensure that the economically vulnerable population, such as those living below the poverty line or on fixed incomes, are not unduly impacted by increases in water and wastewater rates. On September 15, 2020, Salt Lake City closed on a WIFIA loan for the Salt Lake City Water Reclamation Facility Nutrient Project. The WIFIA loan enables the Salt Lake City Department of Public Utilities to balance rate increases for the entire population and better protect the economically vulnerable from excessive financial stresses over the life of the loan. Unfortunately, the costs of the overall Salt Lake City Water Reclamation Facility project have escalated significantly (due to inflation, supply-chain issues, etc.) from the original cost estimate used at the time the application for the WIFIA loan was submitted. These circumstances have prevented the ability to include the construction of a combined heat and power system into the Salt Lake City Water Reclamation Facility Nutrient Project.

An EPA CPRG funding award for the Combined Heat and Power Project will allow it to move forward in tandem with the ongoing Salt Lake City Water Reclamation Facility Nutrient Project - maximizing the awarded funds through incorporation into the ongoing Construction Manager/ General Contractor delivery contract process benefiting the project through existing project management, procurement processes, and contracting.

1. **Transformative Impact** *(15 possible points)*

Salt Lake City is committed to reducing GHG emissions and the Mayor and City Council have jointly set ambitions to power the community with net-100% renewable electricity while also reducing energy-related community carbon emissions 80% by 2040. Salt Lake City supports the U.S. Methane Emissions Reduction Action Plan which advances climate leadership and will help achieve ambitious nationally determined goals to cut GHG emissions by 50-52% by 2030 from 2005 levels (2023 U.S. Methane Emissions Reduction Action Plan). Wastewater treatment is a very energy intensive process, therefore reducing electric power usage at the plant is challenging, and best accomplished in small steps. Salt Lake City currently sources around 14% of the City’s municipal electricity from renewable sources. The City’s goal is to achieve net-50% renewable electricity for municipal operations by 2020 and net-100% by 2030. To help achieve this goal, Salt Lake City has entered into an agreement to develop and purchase electricity from the Elektron Solar Project, an 80 Megawatt (MW) solar farm that is being built in Tooele County. Roughly half of the energy produced by the solar farm will support the City’s municipal facilities, Including the Water Reclamation Facility.

Methane is a powerful greenhouse gas (GHG), 80 times more potent than carbon dioxide. The emissions associated with it can lead to serious public health impacts, from asthma to cancer to premature deaths. Methane is responsible for one-third of the warming impacts millions of Americans have experienced in 2023, from record heat waves and smoke-filled skies to flash flooding and more intense hurricanes (2023 U.S. Methane Emissions Reduction Action Plan). Uncontrolled anthropogenic CH4 emissions from sewers and wastewater treatment contribute to climate change. The wastewater treatment sector may contribute 5-8 percent of anthropogenic CH4 emissions globally. Studies have identified that sewage biomass treatment through anaerobic digestion can produce from 0.01 to 110 grams CH4/m3. In addition, the methane flaring and resultant GHG emissions may have an increased impact on the air quality to residential neighborhoods close to the Water Reclamation Facility, including Rose Park, an ethnically diverse working-class neighborhood directly south of the facility. Another local neighbor who could be impacted by excessive plant emissions is the Guadalupe School. The Guadalupe school is a K through 6 grade charter school that primarily serves the local immigrant community in and is located directly south of the Water Reclamation Facility in Rose Park.

The Combined Heat and Power Project will create transformative anthropogenic GHG emission by repurposing and beneficially using the unlimited, renewable supply of CH4 produced in the City’s sewers and treatment processes. Transformative impacts include the reduction and removal of approximately 10,900 pounds of CH4 emissions from the Wasatch Front per year by beneficially repurposing the methane produced from biomass (i.e., human fecal waste), to generate electrical power and process heat. Using repurposed methane generated from sewage treatment, reduces GHG emissions and provides real cuts to CHG emissions as promised in the U.S. Methane Emissions Reduction Action Plan. Moreover, the proposed combined heat and power project will provide a green energy source promoting overall energy independence for Salt Lake City.

The full staffing needs for the Water Reclamation Facility, including those for the proposed combined heat and power project have not yet been finalized, but it is expected that the operation and maintenance of the Combined Heat and Power Project will require two AFSME union friendly FTE labor positions within the sewer utility. Salt Lake City Department Of Public Utilities has workforce training and development programs and partners with local universities to employ student interns at several locations within the utility. Any new positions will be full time jobs that will extend for decades and make a measurable impact on the lives of our citizens.

Combined Heat and Power technology is critical in promoting the United States and City’s goal of cutting GHG emissions to address climate change. The CH4 emission reductions are measurable as is the green-source electrical power the combined heat and power project will generate. Lastly, the reduction of GHG and specifically CH4 will help to improve the overall wellbeing of human health and the environment along the Wasatch Front and holistically contribute to the health of the planet.

The Combined Heat and Power project will be included in the broader Water Reclamation Facility Nutrient Project effort to seek Institute for Sustainable Infrastructure’s (ISI) Envision Platinum certification. The Water Reclamation Facility Nutrient Project was recently registered with ISI Envision along with another Salt Lake City Department Of Public Utilities project and are the first two projects to be registered with ISI Envision in the state of Utah. This leadership in sustainability will play a pivotal role in project development seeking sustainable certification throughout the region. Additionally, Salt Lake City Department of Public Utilities held a workshop in 2023 to provide ISI Envision training and allowed 15 Salt Lake City staff across different departments to gain their ISI Envision Sustainability Professional (ENV SP) credential to aid in replicating sustainable practices in civil infrastructure projects city wide.

Overall, these transformative initiatives will not only achieve immediate GHG emission reductions but also lay the foundation for long-term sustainability and resilience, positioning Salt Lake City as a leader in sustainable energy innovation and workforce development.

# Impact of GHG Reduction Measures *(60 possible points)*

1. **Magnitude of GHG Reductions from 2025 through 2030** *(20 possible points)*

Reducing the demand for 1 MW of grid purchased electricity per year is estimated to reduce GHG emissions by 2,698 metric tons CO2 equivalent from 2025 through 2030.

1. **Magnitude of GHG Reductions from 2025 through 2050** *(10 possible points)*

Reducing the demand for 1 MW of grid purchased electricity per year is estimated to reduce GHG emissions by 5,975 metric tons CO2 equivalent from 2025 through 2050.

1. **Cost Effectiveness of GHG Reductions** *(15 possible points)*

Total investment in new combined heat and power project = $22,500,000.

$22,500,000 divided by 5,975 metric tons CO2 equivalent through 2050 = $3,765.69 per metric ton CO2 equivalent.

1. **Documentation of GHG Reduction Assumptions – Up to 10 additional pages as an appendix to the workplan (see Appendix C of the NOFO)** *(15 possible points)*

Documentation of GHG reduction assumptions and calculations is provided in the Technical Appendix of this grant application.

# Environmental Results – Outputs, Outcomes, and Performance Measures *(30 possible points)*

1. **Expected Outputs and Outcomes (10 possible points)**

Currently, all the digester gas produced at the Salt Lake City Water Reclamation Facility is being flared. The combined heat and power project which includes installation and operation of two new engine generator units (1 operational, 1 backup) is anticipated to start operation in July 2027.

The proposed project will result in a reduction in emissions of criteria air pollutants such as nitrogen oxides (NOX), volatile organic compounds (VOC), particulate matter (PM10, PM2.5) and carbon monoxide (CO) as shown in Table 1 below.

**Table 1: Pollutants and Projected Reduction in Emissions for 2027 and Beyond**

|  |  |
| --- | --- |
| **Pollutant** | **Projected Reduction in Emissions for 2027 and Beyond** |
| NOX tons per year (tpy) | Note 1 |
| CO (tpy) | ~43% |
| VOC (tpy) | ~58% |
| PM/PM10/PM2.5 (tpy) | ~79% |

**Note:** 1 Actual emissions as a result of the Combined Heat and Power Project implementation of are anticipated to be much lower than the guarantee of 0.6 g/BHP-hr. provided by the vendor. A net reduction in NOX emissions compared to combustion in flares is expected due to higher efficiency for the latest cogeneration equipment.

The Salt Lake City metropolitan area is a nonattainment area for the 2006 24-hr PM2.5 National Ambient Air Quality Standard and the 2015 8-hr Ozone National Ambient Air Quality Standard. The reduction in emissions with the proposed project will result in a net benefit for the airshed and the communities surrounding the Water Reclamation Facility.

1. **Performance Measures and Plan** *(10 possible points)*

GHG Reduction Measure

* Actual quantity of biogas produced through the anerobic digestion process will be tracked and recorded on a monthly/annual basis along with the actual quantity of electricity produced.
* Actual quantity of biogas flared will be tracked and recorded on a monthly/annual basis and evaluated as a percentage of the total biogas produced through the anaerobic digestion process.
* Actual quantity of biogas burned in the new power generation units to produce electrical and thermal power will be tracked and recorded on a monthly/annual basis and evaluated as a percentage of the total biogas produced through the anaerobic digestion process.

CAP Changes

* Actual quantity of CAP emissions from the combined heat and power generation units will be tracked and recorded on an annual basis evaluated as a percent reduction compared to Actual quantity of CAP emissions from combustion in flares.
* Compliance records for Approval Order issued by the Utah Division of Air Quality

1. **Authorities, Implementation Timeline, and Milestones** *(10 possible points)*

The Salt Lake City Department of Public Utilities has the authority to invest in capital projects and facilities for its operations.

The project schedule, Implementation Timeline and Milestones are presented in Table 2 and Table 3 below.

**Table 2: Combined Heat and Power Project Implementation Schedule**



**Table 3: Combined Heat and Power Project Implementation Timeline and Milestones**

| Task | Subtasks | Responsible Party | Authority or Plan to Obtain Authority | Timeline | Milestones |
| --- | --- | --- | --- | --- | --- |
| Salt Lake City Water Reclamation Facility Combined Heat and Power Replacement Project | | | | | | |
| 1.1 Engineering Design Phase - *Develop engineering drawings for the Salt Lake City Water Reclamation Facility Combined Heat and Power Replacement Project* *including electrical improvements required to connect into new 13.8kV plant power system and equipment procurement documents.* | a) Engage Salt Lake City Department of Public Utilities Program Manager and New Water Reclamation Facility (WRF) Program Manager (Pgm) to prepare Basis of Design documents.  b) Engage New WRF Design consultant to engage with Equipment Vendors and prepare Final design Documents.  c) Submit 90% design documents to New WRF Construction Manager/ General Contractor (CM/GC) for GMP pricing | Salt Lake City Department Of Public Utilities and New WRF Project Management (Pgm) and Design Consultant | Salt Lake City Department of Public Utilities | **1.1.a Month 1-4**  Develop Basis of Design documents to explicitly define the scope and design criteria for project.    **1.1.b Month 5 - 16**  Preparation of 100% design documents and approved through City’s review processes.    **1.1.c Month 15 - 16** | Efforts to prepare Basis of Design beginning November 2024  Detailed design begins March 2025 following award of Grant.  GMP Pricing begins February 2026 |
| 1.2 Equipment Procurement Phase - *Conduct equipment solicitation and procure new combined heat and power Engine generators and major electrical equipment.* | Develop solicitation documents, select equipment and pre-purchase equipment | Salt Lake City Department of Public Utilities and New WRF Pgm Consultant | Salt Lake City Department of Public Utilities | **Month 8 - 9**  Develop solicitation documents and select vendors for long lead major Equipment Items  **Month 10 - 25**  Manufacturing and delivery of Delivery of long lead major Equipment Items | Solicitation begins June 2025  Equipment Manufacturing begins August 2025 |
| 1.3 Construction Phase *Construction of Salt Lake City Water Reclamation Facility combined heat and power Replacement Project including demolition, installation of new Engine Generators, interconnecting piping, new electrical building and electrical Improvements to connect to 13.8 kV plant power system.* | Engage New WRF CMGC to construct the SLCWRF combined heat and power Replacement Project. | Salt Lake City Department of Public Utilities and New WRF CM/GC | Salt Lake City Department of Public Utilities | **Month 17 – 32**  Construction of Salt Lake City Water Reclamation Facility Combined Heat and Power Replacement Project | Construction begins March 2026 |
| 1.4 Operations Phase *Startup and commissioning of the Salt Lake City Water Reclamation Facility Combined Heat and Power Replacement Project.* | Engage Salt Lake City Department of Public Utilities Water Reclamation staff to startup and commission the new combined heat and power facilities | Salt Lake City Department of Public Utilities, New WRF Pgm, Design Consultant and New WRF CM/GC | Salt Lake City Department of Public Utilities | **Month 33 – 34**  Startup and commission the new combined heat and power facilities | Startup/Commissioning begins November 2027 |
|  |  |  |  |  |  |
| 1.5 Progress Report *Semi-annual progress reports summarizing technical progress, accomplishments, and milestones achieved.* | Semi-annual report summarizing technical progress, accomplishments, and milestones achieved, expenditures to date and planned activities for the next six months. | Salt Lake City Department of Public Utilities | Salt Lake City Department of Public Utilities | **Month 6, 12, 18, 24 and 30**  Progress Reporting | Progress reporting begins April 2025, 6 months after Grant award. |
| 1.6 Final Report *Detailed final report to EPA within 120 calendar days of the completion of the period of performance.* | Final report including a summary of the GHG reduction measures implemented, outputs and outcomes achieved, and costs of the measures. | Salt Lake City Department of Public Utilities | Salt Lake City Department of Public Utilities | **Month 37**  Final Report | Final Report due November 2027, 120-days after project completion. |

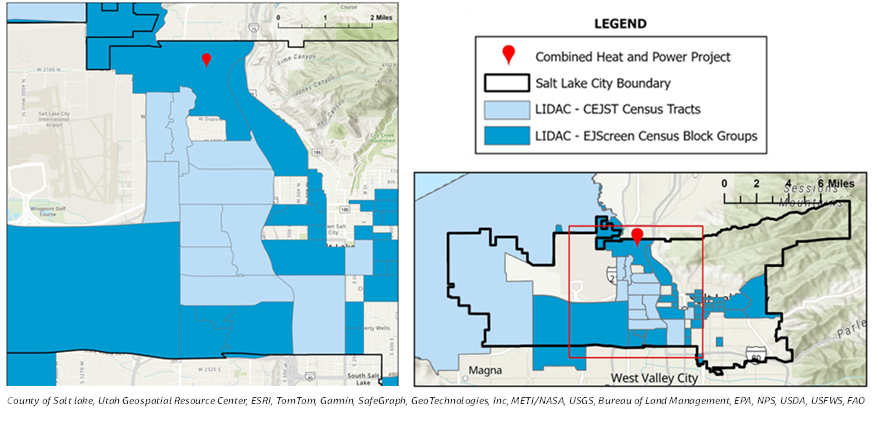
# Low-Income and Disadvantaged Communities *(35 possible points)*

1. **Community Benefits** *(25 possible points)*

The proposed GHG reduction measures for the Combined Heat and Power Project hold significant direct and indirect benefits for low-income and disadvantaged communities mainly on Salt Lake City’s Westside, where the Combined Heat and Power Project is located. Salt Lake City’s Westside is home to 36% of the city’s residents with higher concentrations of low-income and disadvantaged communities compared to the rest of the city. Redlining maps of the 1940s segregated the Westside socio-economically from the Eastside. The arrival of Interstates 15, 80, and 215 and Highway 201 physically isolated the Westside from the Eastside and created increased environmental and socioeconomic burdens in the areas surrounding the highways. The Westside remains a diverse community racially (55.1% minority compared to 34.6% for the city), ethnically (74% of the city’s Hispanic residents), and socio-economically (25.8% living below the poverty level compared to 17.9% for the city).

See Figure 1 below which shows census tracts from the Climate and Economic Justice Screening Tool (CEJST) in light blue, and census block groups from EPA’s EJScreen tool in dark blue, with the location of the Combined Heat and Power Project provided.

**Figure 1: Map of Low-Income Disadvantaged Communities to Benefit from the Combined Heat and Power Project**



These low-income and disadvantaged communities have incomes that average $36,369 to $38,6602 and face challenges in seven of the eight categories outlined by CEJST. Overarching themes for these low-income and disadvantaged communities include asthma, proximity to Superfund sites, wastewater discharge, expected population loss due to climate hazards, traffic proximity, historic underinvestment, risk of flood in 30 years, housing burden, and land covered by impervious surfaces.

Expected Benefits from the Combined Heat and Power Project to low-income and disadvantaged communities include mitigation of global warming hazards by lowering the emissions of greenhouse gases. These hazards include extreme heat, drought, flooding, and expected population loss. Clean energy generation will directly benefit these low-income and disadvantaged communities through reduction of co-pollutants resulting from fossil fuel combustion such as sulfur dioxide, nitrogen oxides, particulate matter, and other pollutants, and these low-income and disadvantaged communities will also benefit from diversification of energy supply with local renewable sources to reduce dependence on imported fuels and energy.

1. **Community Engagement** *(10 possible points)*

The Combined Heat and Power project will be implemented concurrently with the Water Reclamation Facility Nutrient Project. Salt Lake City Department of Public Utilities will incorporate community engagement and education for this project into the ongoing robust public information and engagement program for the Water Reclamation Facility Nutrient Project, and is committed to providing the information people need, as well as opportunities for sharing feedback about the projects, design and educational elements, and construction impacts.

Outreach has been targeted to the Rose Park neighborhood immediately adjacent to the Water Reclamation Facilities, parts of which fall within low-income and disadvantaged communities census tracts. Additional regional outreach through citywide billing and communication, as well as west side centered events, such as the Rose Park community festival, Rose Park Community Council presentations, and Groove in the Grove participation further included residents of low-income and disadvantaged community’s neighborhoods of New Rose Park, Willow Place, Oakley Park, North Meadows, and Fair Park. The Water Reclamation Facility Nutrient Project has also established a relationship with the Guadalupe School to participate in their back-to-school night and STEM activities to educate them on the water treatment process and sustainability actions, further reaching residents of these communities.

The project has an innovative stakeholder engagement and community outreach strategy that gathers community and key stakeholder input and leverages community planning to ensure the project meets the needs of and incorporates feedback from a diverse group of stakeholders and community groups.

Completed stakeholder engagement and community outreach activities include development of informational mailings and construction flyers. Salt Lake City Department of Public Utilities has also conducted interviews, organized public open houses, developed, and executed social media campaigns, hosted site visits, and communicated directly in local communities. The result of these efforts has encouraged strong project support.

**Public Engagement Activities**

Fall 2016 through Present

* Stakeholder interviews – Oct 2016
* Design charrette workshop – Oct 2016
* Rose Park community festival – May 2017
* City Council tour – Mar 2017, 2022, 2023
* Stakeholder interviews – Oct 2018
* Presentation Women in Water – Feb 2019
* Open houses (2) – Apr 2019
* Open house ads (2) – Apr 2019
* Mailers sent to customers about the proposed rate increase – May 2019
* Working groups meetings – Sep & Dec 2019
* Orange snow cone neighborhood outreach events – Sep 2019
* Groundbreaking event – Oct 2019
* Open houses (2) – Jan 2020
* Open house ads – Jan 2020
* Construction starting letters mailed to city residents and businesses – Jan 2020
* Mailers sent to customers about the proposed rate increase – May 2020
* Salt Lake City Department of Public Utilities budget hearings – May/June 2020
* Construction flyer mailing – Aug 2020
* Presentation WEFTEC – Oct 2020
* Construction flyer mailing – Feb 2021
* Working group flyer emails – May 2021
* Construction flyer mailing – Oct 2021
* Working group – Dec 2021
* Rate increase mailers – May 2022
* Open houses (2) – May 2022
* Open house ads – May 2022
* Construction flyer distribution – July 2022
* Avenues Street Fair – Sept 2022
* WEFTEC presentations 2019, 2021, 2022
* SAME presentations 2021
* WEAU presentations 2019, 2021, 2022
* AWWA presentations 2021
* Construction flyer – January 2023
* Guadalupe School coordination – 2023
* Construction flyer distribution – May 2023
* Rose Park Community Council presentation – May 2023
* Rose Park community festival tabling – June 2023
* Groove in the Grove tabling – Sept 2023

Some information gleaned through these efforts includes:

* **The project has broad support.** People have been interested in finding out more about the overall project, water delivery and consumption, wastewater, and project opportunities that can benefit the community. Productive discussions have taken place and information exchanged.
* **Interested in sustainability opportunity.** Many of those who attended the public open houses and participated in working group meetings expressed support and interest in sustainability, and how this project presents sustainability opportunities beyond the typical. People see that this is a unique project that can incorporate sustainability and green elements in a way that is good for the City and community.
* **Engagement has proved to be valuable, and input has been incorporated into the project.** Salt Lake City Department of Public Utilities has tracked the input received through engagement activities, along with stakeholder feedback that is being incorporated into the project. During engagement activities, Salt Lake City Department of Public Utilities has reported what has been incorporated into the project and has received affirmative responses. Engagement with stakeholders has proved to be important and valuable in making the project better. It has allowed Salt Lake City Department of Public Utilities to inform and increase understanding of the project, water, wastewater, sustainability, and the agency itself. It has helped to build relationships and provided stakeholders the opportunity to have a say in the project.
* **Educational needs and resources readily available that could be used to educate the public about the Project**. For example, “orange cone” events, where Salt Lake City Department of Public Utilities sets up pop-up events in neighborhoods with orange construction cones and orange-flavored snow cones. These have created opportunities to share information and have casual conversations and interactions with people who might not attend other engagement activities, or who live in disadvantaged and hard-to-reach communities. During one of these events, a resident who immigrated to the U.S. mentioned that he thought he could not drink tap water and had been buying bottled water and using it for drinking and cooking for the past 10 years. The Project team used this opportunity to share information about Salt Lake City Department of Public Utilities’ high-quality drinking water, including where the water comes from, how it is treated, and why Salt Lake City Department of Public Utilities customers do not need to spend money on costly bottled water.

In addition to the specific outreach that is conducted as part the Water Reclamation Facility Nutrient Project, the department has a robust communication program that regularly shares information about these projects to allow for service area users to participate in the engagement process. Communication channels include utility billings, annual reports, presentations, flyers, mailers, news media, social media posts, and through the website.

Furthermore, in partnership with University Neighborhood Partners (UNP) Salt Lake City has established an Environmental Justice advisory board comprised of community members, including representatives from low-income and disadvantaged community populations, to provide ongoing guidance and feedback on the development and implementation of GHG reduction measures. This workgroup will play a critical role in ensuring that the needs and priorities of low-income and disadvantaged communities are incorporated into project planning and decision-making processes. Through these ongoing engagement efforts, Salt Lake City will create a transparent and inclusive process that prioritizes the needs and perspectives of low-income and disadvantaged communities.

# Job Quality *(5 possible points)*

The technical complexity and critical nature of the proposed Combined Heat and Power project will require Salt Lake City to proactively work to attract and retain skilled workers. These workers will be available to work on other projects in the area once the Combined Heat and Power project is complete, improving the local workforce. On the ongoing New Water Reclamation Facility Nutrient project, the Salt Lake City Department of Public Utilities has identified several structural, mechanical, and electrical contractors who have shown the ability to field a high-quality workforce using an appropriately high level of staff technical expertise and the requisite pay. Salt Lake City would invite and expect several of those contractors to propose on this project.

The Salt Lake Valley has a fairly limited quantity of highly skilled technical labor. The size of the New Water Reclamation Facility Nutrient project, along with other ongoing construction projects in the area, has taxed this existing area labor force and has caused contractors to both develop existing employees and import / hire higher skilled individuals and bring them into the Salt Lake area.

The Davis Bacon wage rate requirements mandated with this project will also assist in drawing highly skilled labor both from the Salt Lake Valley and the western United States. In addition to the Federal wage requirements, Salt Lake City has found that they have also needed to pay an additional subsistence to draw highly qualified staff into the area. The City expects to maintain this policy on the Combined Heat and Power project.

An additional draw for high-quality jobs on this project will be the project requirement for all contractors to provide their staff a qualified health insurance plan that meets the requirements defined in Section 3.24.115 of the Salt Lake City Code.

The City’s main contractor for the New Water Reclamation Facility Nutrient project has partnered with several of the local universities for project internships. This has helped to draw college students from the local area to help provide high-quality jobs for recent college graduates. This also helps the local community by giving these positions to local graduates which may help keep these graduates in the area. The City intends to continue these efforts with the local universities on the Combined Heat and Power project.

# Programmatic Capability and Past Performance *(30 possible points)*

1. **Past Performance** *(10 possible points)*

Salt Lake City has over 35 years of experience managing federal and non-federal assistance agreements and grants including acting as a passthrough entity to other partners. The City has robust pre- and post-award processes, sufficient trained staff to administer and monitor funds, and clear practices in place to ensure compliance and reporting responsibilities are done on time and fully.

A Program Management team comprised of internal Salt Lake City staff and external consultants is currently performing project management and WIFIA funding administration/reporting activities for the $$850M New Water Reclamation Facility Nutrient project.

1. **Reporting Requirements** *(10 possible points)*

The following Table 4 shows four awards Salt Lake City has received, including a demonstration of compliance with reporting requirements and a track record of timely reporting functions including progress towards achieving the expected outputs and outcomes of those awards.

Salt Lake City in conjunction with the New Water Reclamation Facility Nutrient project Program Management team will perform all the required reporting and tracking functions associated with the timely reporting functions including progress towards achieving the expected outputs and outcomes for the EPA CPRG Implementation Grant funding.

**Table 4: Four Awards Received by Salt Lake City**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Award Name and Assistance Listing Number** | **Funding Source** | **Award Amount** | **Description** | **Contact** | **Reporting** |
| Water Infrastructure Finance and Innovation Act (WIFIA) Program | EPA | $386,635,000 | A long-term, low-cost supplemental loan for regionally and nationally significant projects. | Lisa Tarufelli, Salt Lake City Department of Public Utilities Finance Administrator | Quarterly reports are required for this loan and have been submitted on time. The loan was issued under Public Utilities Master Trust Indenture thus is included in annual disclosures on EMMA. Additional reporting prescribed by the loan agreement has also been submitted. |
| Fix the Bricks  97.047 | FEMA | $1,992,895 | A Pre-Disaster Mitigation grant to complete seismic improvements on 100 homes in Salt Lake City. This grant required 25% match. | Kathy Holder  State Hazard Mitigation Officer  Utah Division of Emergency Manager | All reporting for this grant was financial and submitted on time. Due to COVID-19, the grant was extended past the original performance period and ended in March 2023. |
| Homeless Shelter Mitigation Grant | Utah Department of Workforce Services | $2,749,603 | A grant to support decreasing the number of people experiencing unsheltered homelessness including subawards to local shelters. | Melissa Turner, Grant Analyst | Reports for this grant and due quarterly and all have been submitted on time. The grant is currently ongoing and on track to meet outputs and outcomes. |
| Temporary Assistance for Needy Families Grant 93.558 | Utah DWS- Administration of Children and Families | $1,391,672 | Funding for an after-school program | Deborah Bott, Contract Specialist | Quarterly reporting required and submitted on time. This grant is currently ongoing and on track to meet outputs and outcomes. |

1. **Staff Expertise** *(10 possible points)*

Salt Lake City Public Utilities Department in association with a team of internal staff and an external project team will lead and guide the project through completion. Biographies of key departmental and external partners are included below.

**SALT LAKE CITY DEPARTMENT OF PUBLIC UTILITIES INTERNAL PROJECT TEAM**

**Director of Salt Lake City Department of Public Utilities – Laura Briefer, MPA**

Ms. Briefer was appointed Director in March 2016 by Salt Lake City Mayor Jackie Biskupski. Ms. Briefer has worked at SALT LAKE CITY DEPARTMENT OF PUBLIC UTILITIES for 16 years in various areas of the organization and has over 30 years professional experience in natural resource and environmental professions in the public, private, and non-profit sectors. She holds a bachelor’s degree in environmental studies from the University of California at Santa Barbara, and a master’s degree in public administration from the University of Utah. Ms. Briefer is a co-author of two published papers focused on the water resources and watershed management of the central Wasatch Mountains. These include one study regarding climate change impacts on water supplies from the central Wasatch Mountain watersheds published in the journal Earth Interactions, and a paper regarding Salt Lake City’s watershed management published in the journal Ecosystem Services.

Ms. Briefer serves in leadership roles on water issues regionally and nationally. She serves on the board of directors for the National Association of Clean Water Agencies, representing perspectives of clean water interests in Region 8. She is also appointed to the Utah Governor’s Executive Water Finance Board representing municipal and public water system interests. Finally, she serves on the board of directors for the non-profit organization Carpe Diem West, a western water and climate change network, and on the board of directors for the Western Utility Water Coalition.

**Deputy Director of Public Utilities – Jesse Stewart, PG**

Mr. Stewart was appointed Deputy Director by Salt Lake City Mayor Jackie Biskupski in March 2016. Mr. Stewart began working for the City in 2013 in the appointed position (appointed by Mayor Ralph Becker) of Water Quality and Treatment Administrator. Among his duties as Deputy Director, Mr. Stewart serves as the Salt Lake City Department Of Public Utilities procurement official. Mr. Stewart has more than 30 years of experience in management, leadership, engineering, environmental, and natural resources. Prior to transitioning to the public sector with Salt Lake City, Mr. Stewart served as a Principal Level Client Service Manager, Program Manager, and Geologist/Hydrogeologist for an international environmental and engineering firm. He holds Bachelor of Science degrees in Business Administration and Environmental Geoscience and is a licensed Geologist in the State of Utah. Mr. Stewart represents the City on a number of regional water resources committees and boards. For example, he is a member of the Utah Lake Steering Committee, involved with the Great Salt Lake Advisory Panel, and a member of the Utah Division of Water Quality Nutrient Core Team.

**Program Manager & Deputy Director – Jason Brown, PE**

Mr. Brown has over 27 years of professional engineering experience. Jason spent nine years as a private consultant, working on development driven projects. He has 18 years of public service in the Salt Lake City Department of Public Utilities as a Development Review Engineer, Water Team Leader, Capital Improvements Manager, Chief Engineer, and currently as the Deputy Director. While at the City, Jason has led many complex projects including implementing the City-wide Development Review software within the Department, the Wastewater Master plan update, developing a department wide Asset Management plan for each of the four enterprise funds and developing a Capital Asset Program that helps track and prioritize the Departments Capital Improvement needs. Most recently, as the Deputy Director, Jason has modernized the project delivery system to increase accountability, transparency, ease of use and efficiency utilizing SharePoint and Primavera 6 software for the Capital Improvement Program. ICS/NIMS certified as Planning Section Chief and other Planning subsections. Member of American Society of Civil Engineers (ASCE), American Water Works Association (AWWA) and North American Society for Trenchless Technology (NASTT).

**Public Utilities Finance Administrator – Lisa M. Tarufelli, MBA**

Ms. Tarufelli was appointed by then Salt Lake City Mayor Jackie Biskupski in January 2019 as the Finance Administrator for the Salt Lake City Department of Public Utilities. She is responsible for the finance division that includes accounting, budgeting, customer service, billing, and meter reading functions. Ms. Tarufelli has more than 39 years of professional municipal government experience. Lisa has worked extensively in all aspects of municipal finance including utility operations. In her previous position as Director of Administrative Services, Ms. Tarufelli was responsible for these areas as well as information technology, federally funded housing, and museum operations. She has worked with federal grants, state grants, and loans of all types including CWSRF, DWSRF, and WIFIA. Ms. Tarufelli received a Bachelor of Science in Accounting as well as a Master of Business Administration from the University of Utah. Lisa is a member of the Government Finance Officers of America (GFOA) and has been a licensed Certified Public Accountant in the State of Wyoming for over 40 years.

**WRF Design Manager - Michelle C. Barry, P.E., PhD**

Dr. Barry has over 23 years of experience in civil and environmental engineering and research. Her work experience has primarily focused on wastewater and drinking water treatment process planning, design, construction, and research including nutrient removal and advanced treatment of wastewater for reuse. Dr. Barry is a published researcher with articles focusing on the impacts of extreme weather on water quality, the use of ozonation to improve membrane filtration, and catalytic ozonation of wastewater. Her engineering consulting work and now Senior Process Engineer at Public Utilities has ranged from focusing on the basic removal of turbidity and suspended solids from water to more advanced treatment of water for removal of compounds including perchlorate, arsenic, nitrogen, phosphorus, and endocrine disrupting compounds. Dr. Barry strives to ensure all designs she is involved in are efficient, operator-friendly, sustainable, and forward-thinking. She is a member of AWWA and has served as summer faculty at Arizona State University and a volunteer for Water for the People. She is a frequent presenter at both regional and national conferences.

**Contracts Manager - Derek Velarde, P.E.**

Mr. Velarde has more than 20 years of overall engineering experience, with 15 years’ experience leading large capital infrastructure programs. Derek’s experience includes delivery of large capital infrastructure investment utilizing design-bid-build and alternate delivery methods. He has demonstrated experience leading large multi-disciplinary teams, including roles in delivering water/wastewater, transportation, airport, federal, and large-scale public/private infrastructure development programs. Derek is experienced in providing engineering design services that include project development, alternative evaluation, feasibility assessment, design, and construction for water and wastewater facilities throughout the western United States. Derek’s most recent experience with the Salt Lake City Department of Public Utilities includes 10 years leading the City’s Wastewater Program, and currently serving as the Public Utilities Capital Projects Manager, which encompasses the management of all capital program related delivery to include budget development, project development, planning, coordination, design, and construction management. Member of Water Environment Federation (WEF), and North American Society for Trenchless Technology (NASTT).

**WRF Construction Manager- Alex Christensen PE**

Mr. Christensen has eighteen years of professional engineering experience. He was a private consultant for thirteen years, working on environmental, water and wastewater projects. While working with Black & Veatch Alex acted as Engineering Manager for a water treatment plant expansion and recycled water pipeline design projects, as well as acted as Construction Manager for a new water treatment plant project. He has five years of public service in the Salt Lake City Department of Public Utilities as the Water Reclamation Facility Capital Asset Manager, Design Engineer, Inspector and Pretreatment Engineer and currently as the Project Manager for Construction of the New Water Reclamation Facility. While with the City, Alex has worked on many complex projects including managing the Water Reclamation Facility capital assets and acting as project manager for various sewer collection systems and storm water projects. Most recently, as the Project Manager of Construction for the New Water Reclamation Facility Nutrient Project, Alex has been involved with document and design review of the new facility, as well as coordinated with the contractor in anticipation of the construction phases of the project. Member of Water Environment Federation (WEF) and North American Society for Trenchless Technology (NASTT).

**EXTERNAL PROJECT TEAM**

**WRF Project Manager – Grant Davies, PE**

Mr. Davies is a Vice President, Engineering and Senior Project Manager in AECOM’s water/wastewater business line, and professional engineer, with 39+ years of experience in management, engineering, construction, and commissioning of sewage pumping, conveyance, and treatment facilities to meet performance, operability and maintainability objectives, optimize hydraulics, process control, energy management, and improve system reliability, and sustainability. He has been a leader for some of AECOM’s most successful large complex, multiyear water reclamation projects across north America including major upgrades at facilities in Boston, MA; Washington, D.C.; Baltimore, MD; Miami, FL, Victoria, BC, as well as Hong Kong, PRC. He brings both technical competency as a Wastewater Engineer along with project management skills, systems, tools, and controls. Mr. Davies also brings experience serving as both Design/Builder and Owner’s Representative for alternative delivery projects including design/build, CMAR, CM/GC. He is a contributor to the Metcalf & Eddy Wastewater Engineering, 5th Edition textbook, subject matter expert for AECOM’s Water Academy and Technical Practice Network and Lead Verifier for technical quality review of deliverables.

**WRF Program Controls/Administration Manager - Mike Brewer, PE**

Mr. Brewer is a Principal Project Manager with Jacobs Buildings, Infrastructure and Advanced Facilities line of business in Salt Lake City, Utah. He is a proven project delivery manager with over 39 years of experience in project management, planning, design, construction management, and inspection of water and wastewater treatment and delivery system pipelines, utility infrastructure, and other water-related facilities. He has served as Project Manager and has been involved in the design and construction of more than 40 water-related projects including water and wastewater treatment facilities, large-diameter pipelines, and infrastructure rehabilitation programs. Mike is a results-oriented manager with an extensive track record in successfully achieving owner objectives, within cost budget, and on schedule. He combines his solid technical background in engineering with strong project management and alternative project delivery expertise in the planning, design, bidding, and construction services. As the Water Reclamation Facility Program Controls/Administration Manager, he is responsible for the design and construction contracts for work performed on the New Water Reclamation Facility Nutrient Project as well as project controls including WIFIA reporting activities.

**CMGC - Sundt/PCL Joint Venture**

Sundt Construction, Inc. (Sundt) and PCL Construction, Inc. (PCL) have a long and successful history of preconstruction and construction phase collaborations. Sundt Construction, Inc. is one of the country’s largest and most respected general contractors. The 129-year-old firm is 100 percent employee-owned and known nationally for its commitment to quality and innovative approaches to construction services. PCL is an employee-owned corporation that started operations in 1906 as a general contracting company. The PCL family of companies is a group of independent construction companies which carry out diverse operations in the civil infrastructure, heavy industrial, and buildings markets throughout North America. Moreover, the proposed team for the Salt Lake City Department of Public Utilities New Water Reclamation Facility Nutrient Project has been working together on similar projects and roles for 30 years, and across multiple projects and companies. Life and career might take you in different directions, but that bond of friendship and commitment to success is never extinguished. Sundt/PCL’s proven team will immediately bring recent lessons learned and project execution efficiencies to the Salt Lake City Department Of Public Utilities team.

# Budget (Optional Budget Spreadsheet and up to 10 additional pages may be added if needed as an appendix to the Workplan) *(45 possible points)*

1. **Budget Detail** *(20 possible points)*

The total EPA CPRG Implementation Grant funding requested for the Salt Lake City Combined Heat and Power Project is $22,500.000.00 as presented in the Table 5 below. The Grant funding requested will be used to cover the costs associated with the Engineering Consultant’s design and services during construction, procurement, manufacturing and delivery of major equipment with long lead delivery times and the General Contractors services to construct the facilities associated with the Salt Lake City Combined Heat and Power Project.

Salt Lake City is planning to implement the Combined Heat and Power Project in conjunction with the current New Water Reclamation Facility Nutrient Project in order to maximize the awarded funds through incorporation into the ongoing Construction Manager/General Contractor delivery contract process benefiting the project through the current program management, procurement, and contracting processes. Therefore, the project management and grant administration/reporting activities associated with the Combined Heat and Power Project will be covered and performed under the current program management contract budget for the broader New Water Reclamation Facility Nutrient Project. Thus, no additional project management and grant administration/reporting costs are included in this EPA CPRG Implementation Grant funding request.

A detailed cost breakdown and basis of cost estimate is provided in the Budgetary Narrative Appendix.

**Table 5: Salt Lake City Water Reclamation Facility Combined Heat & Power Project – Budget Summary**

|  |  |  |
| --- | --- | --- |
| **Category** | **Line Item & Itemized Costs** | **Total EPA Funding** |
| **EQUIPMENT PROCUREMENT** | Two New Generators and Heat Exchangers | $2,700,000.00 |
| One Paralleling Switchgear | $1,100,000.00 |
| One 4160 V Transformer | $300,000.00 |
| **TOTAL EQUIPMENT PROCUREMENT** | | **$4,100,000.00** |
| **Engineering Design Consultant** |  |  |
| **Design** | Engineer to provide engineering plans and specifications to bid and construct the Combined Heat and Power Project | $1,400,000.00 |
| **Services During Construction (SDC)** | Engineer to provide Engineering Services During Construction | $1,500,000.00 |
| **Startup and Commissioning** | Engineer to provide Startup and Commissioning | $400,000.00 |
| **TOTAL ENGINEERING AND DESIGN** | | **$3,300,000.00** |
| **Construction** |  |  |
| **Construction activities associated with implementation of the Combined Heat and Power** | Electrical Building | $2,500,000.00 |
| Electrical and Controls | $1,100,000.00 |
| Demolition, Yard Piping, Sitework, Yard Electrical, Plant Computer System | $2,700,000.00 |
| Mob, Bond, Insurance, GCs, Contingency & Market Adjustment | $8,400,000.00 |
| **TOTAL CONSTRUCTION** | | **$14,700,000.00** |
| **OTHER** |  |  |
| **Permitting** | Engineer to procure required permits | $400,000.00 |
| **TOTAL FUNDING REQUEST (2024 dollars)** | | **$22,500,000.00** |

1. **Expenditure of Awarded Funds** *(15 possible points)*

The City employs a process to closely monitor and track grant funds and timelines:

1. The department and program manager ensures the program elements of the grant are in accordance with the grant agreement by reviewing the Workplan, Logic Model, Timeline & Milestones, and award letter. These activities and milestones are tracked through internal project management and calendar tools and assigned to relevant staff.
2. The Finance Grant Manager reviews expenditures and ensures they are in accordance with both City policies, the grant agreement and overall EPA and federal grant requirements.  After review, the Finance Grant Manager submits any reimbursement requests, backup documentation, and any other financial statements requested by the Funder.
3. The Chief Financial Officer oversees the Finance Grant Manager to ensure all financial transactions follow correct accounting and financial procedures.
4. The City is audited once a year by an independent auditor to ensure the City has adequate policies, practices, and safeguards in place to protect it from any fraudulent practices.
5. The New Water Reclamation Facility Nutrient project Program Management team will perform all the required reporting and tracking functions associated with the timely reporting functions including progress towards achieving the expected outputs and outcomes for the EPA CPRG Implementation Grant funding.

The projected cashflow for overall expenditure of the Grant funds is presented in Table 6 below.

**Table 6: Projected Cashflow for Overall Expenditure of Grant Awarded Funds**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Projected Expenditure of Grant Awarded Funds** | | | | |
| Calendar Year of Expenditure | 2024 | 2025 | 2026 | 2027 |
| Projected Amount to be Spent | $200,000 | $2,600,000 | $12,700,000 | $7,000,000 |

1. **Reasonableness of Costs** *(10 possible points)*

The Budget shown above was developed based on a probable construction cost estimate for use in establishing a reasonable capital cost budget for the Salt Lake City Water Reclamation Facility Combined Heat and Power Project. The scope of work for the Combined Heat and Power Project includes:

a) Construction of a new Electrical Building.

b) Purchase and installation of two new high-efficiency Engine Generators and Heat Exchangers.

c) Purchase and installation of one Paralleling Switchgear.

d) Purchase and installation of one 4160 V Transformer.

e) New electrical and control systems.

f) Connection to the new 13.8 kV plant electrical distribution system.

g) Sitework, yard electrical and yard piping Infrastructure to support the new facility.

The probable construction cost estimate to support this EPA CPRG Implementation Grant funding request was developed using the following resources and criteria:

a) Budgetary equipment quotes received from reputable suppliers.

b) Factored costs from similar projects.

c) Square foot estimates from industry accepted sources for building costs.

d) Average percentages of construction costs to factor non-construction costs.

e) Industry-typical percentages for contractor overhead and profit.

f) Experienced estimator judgement.

g) General Pricing information obtained from RS Means Construction Cost resources.

h) Historical material prices when quotations are not available.

The following assumptions were included in the development of the cost budget presented herein:

* + Construction labor costs for the Combined Heat and Power Project used in the development of this budget are based on the minimum prevailing wage requirements of the Davis-Bacon Related Acts for the Salt Lake City area.
  + Construction material costs for the Combined Heat and Power Project. This budget was developed based on the requirements that all iron, steel, manufactured products, and construction materials used for the Combined Heat and Power Project comply with EPA’s Build America, Buy America (BABA) Act.