

Sample Audits Preliminary Technical Energy Assessment and Final Investment Grade Audit



Prepared for:

State Procurement Office
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Sample Audits

On the following pages, we have reiterated our response to item 4.1 of the RFP requesting our sample audits. This introduction is followed by copies of our sample audits from our performance contract with Twentynine Palms Marine Corps Base.

Please note that, as an environmental conservation measure, we have provided one hard copy of this Sample Audit package, and have also enclosed a CD containing the sample audits. At your request, we would be pleased to provide additional hard copies of this Audit package.



4.0 Technical Approach

4.1 *Samples: Preliminary Technical Energy Audit (TEA) and Financial Investment Grade Audit*

Under separate cover, provide representative SAMPLE audits of a preliminary TEA and a final IGA that is applicable for an energy performance contracting project in a government facility. (See RFP for proper delivery media.)

In response to this section, provide a brief description of the audits, including energy and economic calculations, and verification that the sample audits were conducted by current members of the company's team proposed for the DAGS Energy Performance Contracting Program (HEPCP). Provide a description of the process your company uses for typical audits (TEA and IGA) in the types of facilities that will participate in the program. Note any changes that will be made to comply with requirements for the program. (Provide the SAMPLE audits under separate cover with an introduction repeating the response for this section.)

Sample Audits

TEA and IGA Samples

Johnson Controls has responded to this solicitation to demonstrate our capabilities as the world leader in sustainability, greenhouse gas emissions reduction, energy management and energy conservation. This is further demonstrated by the Johnson Controls project at Twentynine Palms Marine Corps Air/Ground Combat Center, where various ECMs, a photovoltaic array and a central plant were installed. Submitted under separate cover, the sample preliminary technical energy assessment (TEA), or site survey report as termed under the Army National ESPC, and final investment grade audit (IGA), or detailed energy assessment, for this project are just two of many examples where Johnson Controls has provided integrated solutions and successful projects to government customers that want to implement a complete sustainability strategy.

Project Description

A long-term strategic approach to energy efficiency developed by Johnson Controls is helping the Twentynine Palms military base to secure a reliable energy supply, while saving nearly \$7 million per year.

Under a comprehensive facility systems project, Johnson Controls upgraded five chiller plants on the base and installed a \$16 million, 7 MW dual-fueled cogeneration system. The existing phase of the project includes a 1.1 MW photovoltaic plant, which is one of the highest-capacity non-utility solar power plants in the world.



Twentynine Palms is located 45 miles north of Palm Springs, California, and is the site of the Marine Air Ground Task Force Training Command (MAGTFTC), which operates the U.S. Marine Air Ground Combat Center, promoting readiness of operating forces. The Command provides facilities, services, and support to meet the needs of Marines, sailors, and their families. The base covers 632 square miles and is home to 11,000 Marines and 814 officers. Its total population, including dependents of service personnel, exceeds 25,000.

Meeting the Energy Challenges

Located at the end of the utility distribution line, the base experienced frequent power disruptions, and the Twentynine Palms facilities management division wanted to increase power reliability and make the base more self-sufficient. The base was also challenged by federal orders to reduce energy consumption and use renewable energy sources.

To meet these challenges, Twentynine Palms began working with Johnson Controls on a facility optimization project that included five chiller plant upgrades. As part of that project, Johnson Controls audited base buildings, developed a comprehensive plan, coordinated funding, and guaranteed results.

Johnson Controls entered into an Energy Savings Performance Contract, administered by the U.S. Army Corps of Engineers and the Naval Facilities Engineering Service Center, to implement a long-term approach to reducing the military base's energy expenditures and increasing its energy self-sufficiency. Among our extensive work at the base, we provided a central utilities plant, which included the installation of a 7 megawatt dual-fueled cogeneration system and, at the time it was built, the largest non-utility solar photovoltaic power plant in the world, at 1.1 megawatt output.

Installation of the cogeneration system included the construction of a 7,200-square-foot turbine hall, a three-mile, high-pressure gas line, and all connections to the electrical substation. The system increases the base's electric power reliability while reducing electricity purchases from the local utility by almost two-thirds, resulting in annual cost savings of approximately \$5.8 million.

The base was able to offset existing hot water boilers in their Central Plant with higher efficiency hot water production using gas turbines. The hot water is essentially a useful free byproduct, used by the base's absorption chillers in the summer to produce air conditioning, and by its boilers for heating the base in winter. As a result of efficient system planning and design, the overall cogen system efficiency is estimated to be 75 percent, 2.5 times greater than the average efficiency of the U.S. electric grid, and resulted in a significant decrease in regulated air emissions on base.

The plant's photovoltaic (PV) cell array features 8,000 solar panels covering about 8 acres. The operator monitors the production of power from the PV array and the cogeneration plant with an integrated programmable logic controller (PLC) system. A



single axis solar tracking system is used to automatically pivot the solar modules to directly face the sun, increasing the effectiveness of the solar modules. The system's tracking capability generates as much as 25 percent more energy annually than a typical fixed system. As a result, the clean and quiet, renewable power PV system provides power when it is most needed – from about 9:00 a.m. to 3:00 p.m. in the winter and from 9:00 a.m. to 5:00 p.m. in the summer, corresponding to the existing peak load requirements at the base. This system generates approximately 12 percent of the base's electrical power needs.

Overall, Johnson Controls' program improvements produce energy savings of about \$6.9 million per year for a total savings of \$138 million over the 20-year term. All savings guarantees have been met through Year 5 of Project 1 and through Year 2 of the combined Projects 2 and 3.

Personnel

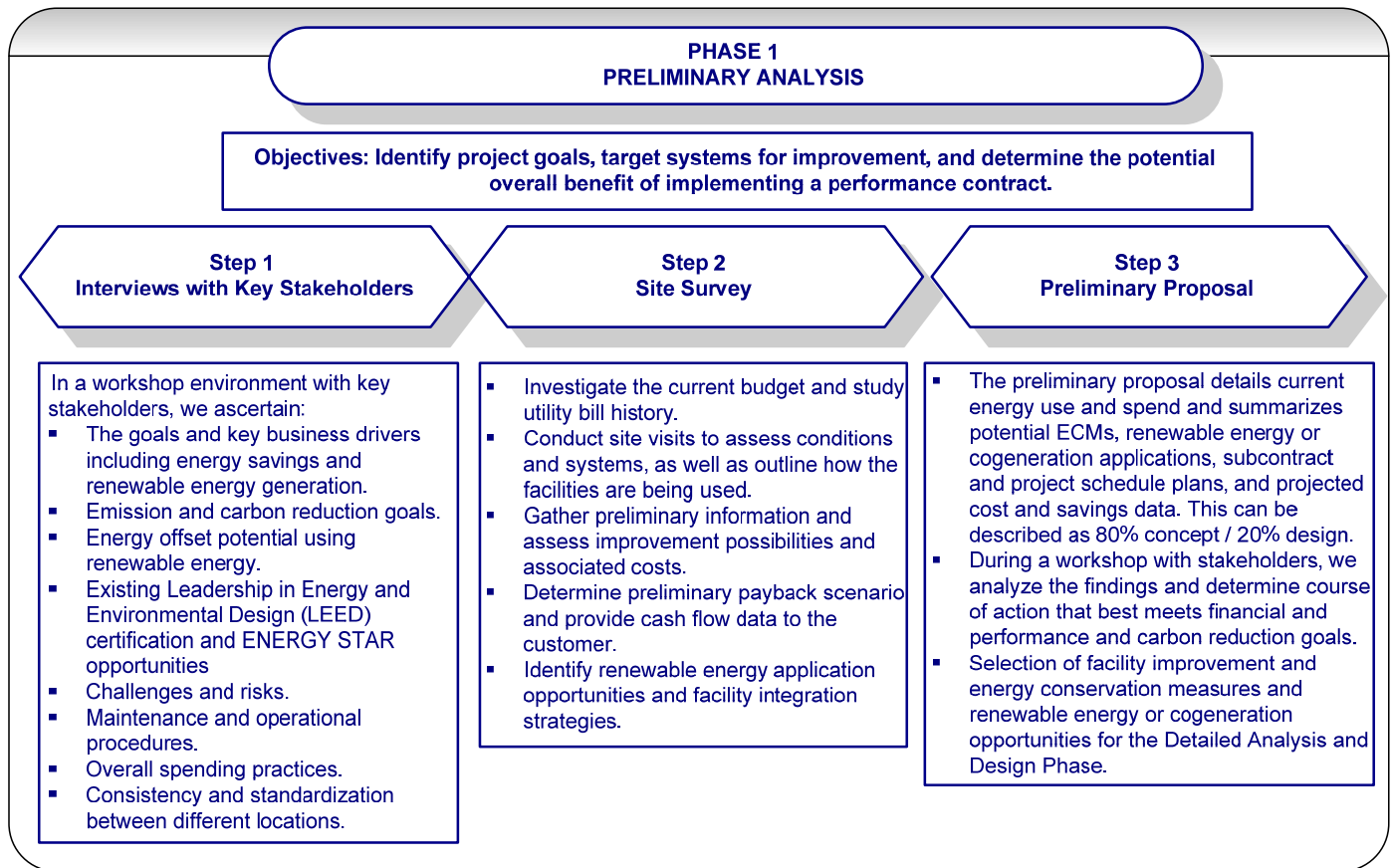
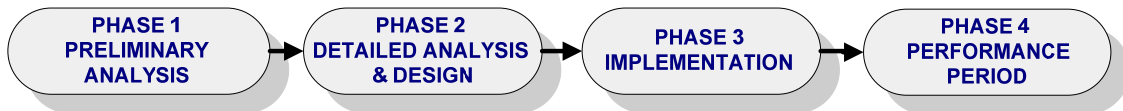
At this time, since no contract for an energy project has been awarded to Johnson Controls, it is difficult for us to make assumptions regarding the assignment of company project personnel. However, when assigned a project by the State of Hawaii's DAGS Energy Performance Contracting Program (HEPCP), it is possible that personnel assigned to our sample audit project at Twentynine Palms will be assigned to a State of Hawaii project. Appropriate, qualified personnel are assigned to all projects.

Audit Process / Performance Contracting Approach

Conducting Preliminary Technical Energy Assessments and Investment Grade Audits are just one aspect of Johnson Controls' overall performance contracting process. As such, the response to this item not only provides detail of our auditing processes, but also an overview of our overall, four-phased approach to performance contracting. No matter the juncture of the project, the State of Hawaii will have a clear understanding of our performance contracting process since we integrate stakeholder involvement throughout.

The following graphics define the four main phases the State of Hawaii can expect our project team to follow. Effectively, the State of Hawaii will receive greater value at less risk since our process incorporates and takes advantage of the best of the architectural, engineering and contractor disciplines that only the most experienced energy services company can provide.

Please note, any investment grade audit report Johnson Controls provides will be signed and sealed by a professional technical engineer registered in the State of Hawaii, specializing in Energy Management.





PHASE 2 DETAILED ANALYSIS & DESIGN

Objectives: Determine the project parameters and funding sources for the project, conduct in-depth assessments of the facilities and create the proposal detailing the scope of the project.

Step 1 Determine Final Scope, Pricing and Funding Source

- In workshop settings, we finalize:
- Method of establishing project baselines.
 - Measurement and verification approach.
 - Operations and maintenance and service.
 - Construction coordination.
 - Financial strategy.

Step 2 Detailed Engineering and Energy Study and Report

- Collect data through utility and facility surveys.
- Develop project baselines.
- Conduct a technical and economic feasibility analysis.
- Perform a lifecycle cost analysis of each ECM and renewable energy applications. The following are considered when developing the model:
 - Energy cost impact and simple payback
 - Useful life
 - Effect on building maintenance and operation cost
 - Implementation timeline
 - The customer's priority list of improvements
 - Positive effects on tenant comfort and system reliability
 - Emission and carbon reductions, along with potential electrical energy offset associated with each ECM or renewable energy application
 - Total renewable energy (thermal or electric) delivered to the facility
- In a workshop setting, determine final selection of ECMs and renewable energy applications for the project. Facility improvement measures are refined to a stage of 100% concept / 90% design to verify that the measure indeed meet the facility and financial requirements.
- Create design and construction documents.

Step 3 Report Delivery and Performance Contracting Agreement

- Conduct a cost avoidance calculation.
- Initiate a competitive bid process with customer-approved subcontractors.
- Negotiate and sign agreements with subcontractors.
- Finalize overall project costs.
- Generate final report.
- Organize a final project review/ workshop.



PHASE 3 IMPLEMENTATION

Objectives: Complete project scope, closeout project and educate the staff to effectively maintain new systems/equipment.

Step 1 Construction

- During the implementation phase, the measures are brought to 100% design through a submittal and approval process.
- Equipment procurement and subcontract executions.
- Our project manager oversees the process, our personnel and the subcontractors.

Step 2 Commissioning

- Customer and Johnson Controls representatives will conduct a final inspection to verify compliance to the contract documents.
- Johnson Controls will prepare and submit closeout records and as-built documents to the customer.
- Commissioning all features of the new or upgraded equipment will be conducted using the manufacturer's specifications, as well as the performance criteria established for the specific project.
- Upon completion, Johnson Controls will request final acceptance from the customer.

Step 3 Training

- The Johnson Controls Institute will customize additional training to meet the needs of the customer and offers:
- Packaged training programs.
 - Computer-based training packages.
 - Branch and on-site instruction.
 - Videotapes of the training for subsequent use.
 - A wide variety of programs that can further enhance energy reduction including Sustainable Energy Education & Communications (SEEC) which educates facility occupants and Green Compass which provides insight into making a building greener.



PHASE 4 PERFORMANCE PERIOD

Objectives: Compare pre-retrofit and post-retrofit conditions, provide technical assistance as contracted and detail overall project performance.

Step 1 Monitoring and Verification

We offer four general approaches to assessing savings, in accordance with FEMP and IPMVP guidelines:

- Option A - Stipulated Savings and Baseline [Verified equipment performance (Watts, kW/ton)].
- Option B - Measured/Stipulated Baseline, Verified Performance (Estimating tool calibrated with end-use data).
- Option C - Comparison of Similar Buildings With and Without ECMs Using Whole Building Data (hourly or monthly) (Utility billing analysis).
- Option D - Stipulated Baseline, Verified Performance (Simulation model calibrated with whole building data).

Using the approach specified in the contract documents, the Performance Assurance Engineer will monitor, track, document and report the savings being generated to the customer's administrative team at specified intervals.

Step 2 Maintenance and Support

We use data from reactive, preventive, and predictive maintenance efforts to assess each system in order to improve overall reliability while controlling costs. We may employ the following techniques in our proactive maintenance program:

- Root cause failure analysis.
- Performance specifications.
- Engineering evaluation.
- Operational/verification of new and rebuilt equipment.

Step 3 Performance Period Closeout Report

In addition to annual performance reports, Johnson Controls will provide the customer with a final report summarizing the entire project. We will compare baseline totals with guaranteed totals to show the project's impact in its entirety.

**Preliminary Technical Energy Assessment
Twentynine Palms**

TWENTYNINE PALMS MCAGCC SITE SURVEY REPORT FOR PROJECT THREE



Submitted by

JOHNSON
CONTROLS

7/24/01

This proposal or quotation includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed—in whole or in part—for any purpose other than to evaluate this proposal or quotation. If, however, a contract is awarded to this offerer or quoter as a result of—or in connection with—the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in all sheets of this volume.

EXECUTIVE SUMMARY

Johnson Controls is pleased to provide this Site Survey Report (SSR) for Project 3 at MCAGCC Twentynine Palms pursuant to the direction issued by the Department of Navy (DON) ESPC Team by letter on May 17, 2001. The ECSMs proposed herein address specific areas of preliminary study requested by MCAGCC Twentynine Palms and the DON ESPC Team.

We gratefully acknowledge the MCAGCC Twentynine Palms personnel who provided input on this effort including, but not limited to, LtCmdr Tye, Ike Burr, Wayne Hofeldt, Gary Morisette, and Jim Wheeler. This SSR is the result of a team effort and benefits from this coordinated involvement that is reflected in the solutions presented in this document.

In this SSR, we are presenting two scenarios, a Standalone task order and one for an Alternate, combined task order. The scenarios are based on applications of two different electrical rates.

In the Standalone scenario, our financial assessment is based on applying the same electric rate as submitted on June 29, 2001 for Task Order 2, Cogen. We have assumed a separate task order award process for these measures as they stand on their own financial merits, moving forward to the Feasibility Study phase. This scenario will not utilize any financial support from Task Order 2. The ECSMs included are:

- ECSM 1: Waste Water Treatment Plant Pump Variable Frequency Drives and associated motor upgrades
- ECSM 2: Skylights and Daylighting Control for several warehouse facilities
- ECSM 3: Domestic Water Solar Heating Refurbishment at three BEQ buildings

These ECSMs will provide the following benefits to MCAGCC Twentynine Palms:

- Reduced energy consumption
- Additional domestic solar hot water production

In the combined Alternate scenario, we have applied the currently published TOU-8 (2-50kV) electric rate from Southern California Edison to the savings analysis. We have combined the Task Order 2 savings stream in the analysis to demonstrate the effect of recognizing the current electric rate and associated savings benefit to MCAGCC Twentynine Palms. This approach will utilize the combined savings stream to support all of the energy-related projects desired by MCAGCC Twentynine Palms in this SSR, with the exception of the Ground Source Heat Pumps ECSM.

The ECSMs financially supported in this approach include those identified in the standalone scenario as well as the following additional measures:

- ECSM 4: Energy Management Control System Upgrade
- ECSM 5: One-MW Wind Turbine Generator System
- ECSM 6: Air Conditioning System Upgrades

- Project 2 ECSM: High Temperature Hot Water (HTHW) Hospital Loop Extension (previously reviewed and removed from Project 2)

We have assumed for our analysis that Task Order 2, Cogen, will be awarded by the end of September, 2001 and the alternate scenario ECSMs identified will be incorporated into that Task Order via a contract modification prior to construction completion on the cogen plant.

The application of the current published electric rate to these projects directly affects the level of value delivered under the ESPC vehicle. The benefits to MCAGCC Twentynine Palms are many and include:

- Comprehensive system improvements base-wide
- Maximum available energy use reductions
- Increased level of independence from the utility grid (Island of Power)
- Leveraged utilization of the savings created by the cogen plant
- Real-time energy system management
- New HTHW loop for future construction needs
- Potential to balance the HTHW system and resolve chronic HTHW system issues

We recommend that the electric rate issue be addressed concurrent with the Task Order 2 process and that a reasonable current rate be incorporated in the cogen plant financial analysis as proposed. The benefit to MCAGCC Twentynine Palms and the DON Team will be a more comprehensive application of the ESPC with greater results.

ECSM 1: WASTE WATER TREATMENT PLANT PUMP VFDS

EXECUTIVE SUMMARY

This ECSM will install variable frequency drives (VFD) and new pump motors at the waste water treatment plant. Energy savings will be realized by operating the pumps at lower flow levels while still meeting the required processing flow of the plant.

1. IDENTIFICATION AND DESCRIPTION

The MCAGCC Twentynine Palms waste water treatment plant has four sets of water pumps. These sets of three pumps each are used for pumping clarifier influent, filter influent, filter effluent, and reclaimed water. Only one of the reclaimed water pumps is operated at a time. One or two pumps in each of the remaining sets will operate depending on the plant processing flow. The pump operation averages approximately 12 hours per day during the winter and is nearly continuous during the summer. All of the pumps are constant flow. The pump flow rates are not balanced in the current system. The pumps upstream of the treated water storage tank have a lower flow rating than the reclaimed water pumps that deliver water for landscape irrigation.

A total of seven VFDs and seven new inverter-rated motors will be installed. A VFD and motor for a reclaimed water pump and for two pumps in each of the other sets of pumps.

The VFDs will be used to regulate the pump speeds and water flow through the treatment plant. Under the current treatment plant load, the pumps will typically operate continuously at reduced speed. Reducing the flow rate through a distribution system reduces the head pressure loss due to friction; hence, reducing the power requirement at the pump. The VFDs will provide soft-start capability for the pumps. The VFDs will also give the plant operators the ability to optimize the flow of water through the treatment plant. The benefits of controlling pump flows include maximizing the treated water contact time in the storage tank, which will improve the quality of the water delivered for irrigation, and regulating the overall plant flow rate to prevent algae bloom. This new system of pumps will provide for the balancing of the flow rates of the waste water treatment plant.

A project to convert the waste water treatment plant to utilize wetlands for the water treatment is being investigated under a different program. If the wetlands project is implemented, the filter influent pumps would be eliminated and the clarifier influent pumps may also be removed, however benefits would still be realized by the variable flow operation of the remaining pumps.

2. DETAILED ECONOMIC ANALYSIS

Electricity costs were developed from the Southern California Edison TOU-8 rate schedule effective on April 9, 2000. Electricity costs for this project take into account the time of day and period of the year during which savings will occur.

The baseline operating hours were developed based on typical winter and summer flows through the treatment plant and the available pump data. The proposed flow rates were based on the same summer and winter flows and the assumption that the pumps would operate continuously.

Baseline Operating Hours = Typical Plant Treatment gal/day / pump capacity gal/hr

Proposed Flow gpm = Typical Plant Treatment gal/day / 1,440 minutes/day

Exist Pump kW = motor hp * 0.746 kW/hp * 0.58 typical process pump load / (motor efficiency)

Post-Installation Pump kW = motor hp * 0.746 kW/hp * 0.58 typical process pump load * part load factor / (motor efficiency * VFD efficiency)

The part load factor as a function of motor speed was developed using information from the DOE 2.1 California Compliance supplement.

3. ENERGY SAVINGS PROPOSED

Proposed energy and energy cost savings are presented in Tables 1 and 2.

Table 1: Proposed Annual ECSM Energy Savings

	Electricity		
	Consumption (kWh)	Annual Peak Demand (kW)	Total On-Peak Demand (kW)
Baseline	325,168	871.2	72.6
Post-Installation	151,110	177.6	24.6
Total Savings	174,058	693.6	48.0

Table 2: Proposed Annual ECSM Cost Savings

	Electricity	Total Utility Costs
Baseline	\$29,250	\$29,250
Post-Installation	\$11,337	\$11,337
Total Savings	\$17,913	\$17,913

Note: Energy savings based upon Task Order 2 utility costs

4. UTILITY, ENVIRONMENTAL, OR OTHER IMPACT

Environmental permits will not be required for the implementation of this ECSM.

Additional operations and maintenance procedures will be necessary for the VFDs. It is assumed that these will be offset by reduced maintenance requirements for other components of the treatment plant and will be the responsibility of MCAGCC Twentynine Palms.

No hazardous waste will be generated as a result of implementing this project.

ECSM 2: SKYLIGHTS AND DAYLIGHTING CONTROL

EXECUTIVE SUMMARY

This ECSM will install skylights in several buildings. Daylighting controls will also be installed to control the existing lighting systems. The daylighting controls will turn off the lights when there is sufficient light provided by the skylights and will turn them on when sufficient daylight is not available.

1. IDENTIFICATION AND DESCRIPTION

Skylights and a daylighting controller will be installed in the following buildings: 1102, 1317, 1337, 1350, 1816, 1817, 1920, 1980, 1954, 2020, 2044, and 2054. All of these buildings have large open areas with high ceilings. Skylights will be installed in storage, warehouse, and shop/maintenance areas. New daylighting controllers will sense the light level in the space and turn the lights off when sufficient light is provided by the skylights. The controllers will turn the lights on when sufficient daylight is not available. The lights are generally turned on sometime between 0530 to 0730 and then turned off between 1500 and 1700. It is projected that the average yearly operating hours will be reduced by 60%.

2. DETAILED ECONOMIC ANALYSIS

Electricity costs were developed from the Southern California Edison TOU-8 rate schedule effective on April 9, 2000. Electricity costs for this project take into account the time of day and period of the year during which savings will occur. Site personnel provided the natural gas prices used for this project. The daylighting analysis was performed using the program SkyCalc, a component of the "Energy Design Resources" tools suite available from Southern California Edison as part of their new construction services. It is a complex, Microsoft Excel-based modeling tool. The analysis takes into account interactive heating and cooling effects.

The following assumptions pertain to the inputs used for the SkyCalc analysis:

- Weather data were based on heating degree-day, cooling degree-day, and mean solar radiation for Rialto, California.
- Building dimensions, ceiling heights, surface reflectance, and other building characteristics vary, as recorded on-site or as supplied by site personnel.
- Building heating and cooling systems variation, as recorded on-site or as supplied by site personnel.
- Skylights to be double-glazed, white acrylic, with 65% visible transmittance and 75% solar heat gain coefficient, nominal 4 feet by 8 feet with 1 foot well and safety grate.
- Light levels were targeted to match the high end of existing case general light levels.

The proposed quantity of skylights was based on an optimization for overall energy savings, in consideration of lighting, cooling, and heating energy. For most of the facilities, the projected sky-

light area to floor area ratio ranges between 0.04 and 0.05, with variances due to considerations of spacing and layout.

The calculations in support of this analysis are contained in the packaged simulation tool, and are based on the assumptions listed above as well as additional embedded assumptions pertaining to building envelope, occupancy, and facility usage characteristics.

3. ENERGY SAVINGS PROPOSED

Proposed energy and energy cost savings are presented Tables 1 and 2.

Table 1: Proposed Annual ECSM Energy Savings

	Electricity	Other Utilities
	Consumption (kWh)	Natural Gas (therms)
Baseline	484,155	0
Post-Installation	202,859	3,619
Total Savings	281,296	(3,619)

Table 2: Proposed Annual ECSM Cost Savings

	Electricity	Natural Gas	Total Utility Costs
Baseline	\$52,290	\$0	\$52,290
Post-Installation	\$21,909	\$1,375	\$23,284
Total Savings	\$30,381	\$(1,375)	\$29,006

Note: Energy savings based upon Task Order 2 utility costs
Heating and cooling penalties are added to the post installation energy use

4. UTILITY, ENVIRONMENTAL OR OTHER IMPACT

Environmental permits will not be required.

Additional operations and maintenance procedures will be necessary to keep the skylights clean and are assumed to be the responsibility of MCAGCC Twentynine Palms.

No hazardous waste will be generated as a result of implementing this project.

ECSM 3: DOMESTIC WATER SOLAR HEATING REFURBISHMENT

EXECUTIVE SUMMARY

The solar domestic hot water systems on the roofs of Buildings 1464, 1466, and 1467 are damaged and not functioning properly. This ECSM will repair and replace solar panels and the controls to make the existing systems operational. Implementing this project will reduce the use of central plant high temperature and hot water required to produce domestic hot water for the barracks.

1. IDENTIFICATION AND DESCRIPTION

The solar domestic hot water systems on the roofs of Buildings 1464, 1466, and 1467 have been non-operational for several years. Many of the solar panels have been damaged or no longer work due to leaks or fouling. This project includes a full refurbishment of the systems and updating the controls. To provide a measure of protection from willful damage, a screening system will be developed during the feasibility study to ensure savings from this ECSM are realized.

2. DETAILED ECONOMIC ANALYSIS

In 1996, the engineering firm subcontracted for this Site Survey Report performed a comprehensive energy study of the site and recommended the same measure for Buildings 1462, 1463, 1466, and 1467. Since then, the systems for Buildings 1462 and 1463 have been repaired. The system serving Building 1464 is identical to those repaired systems. The savings analysis performed in 1996 used a method developed by Duffie and Beckman, in *Solar Engineering of Thermal Processes*, 1991. The collector position and efficiency were estimated, and the panel quantity and area were measured. These inputs determined the amount of solar radiation the collectors would absorb to heat the water. Gas savings were calculated from using the solar panels instead of the CHP HTHW generators. The site personnel provided the natural gas cost rate used for this project.

At the time of the site visit, the reason for panel failure was not determined. Conversations with the Radco product representatives (the collector manufacturer) for the system serving Building 1467 revealed that troubleshooting the problem would determine the extent of repair. If the panels have suffered freeze damage then they would need to be replaced. Leaks and fouling, however, require only minor repairs. The material cost estimate assumed that 18 of 264 panels would need to be replaced. Labor costs were estimated per building based on discussions with the equipment manufacturer and the results of the previous energy study.

3. ENERGY SAVINGS PROPOSED

Proposed energy and energy cost savings are presented Tables 1 and 2.

Table 1: Proposed Annual ECSM Energy Savings

	Natural Gas (therms)
Baseline	19,700
Post-Installation	0
Total Savings	19,700

Table 2: Proposed Annual ECSM Cost Savings

	Natural Gas	Total
Baseline	\$7,486	\$7,486
Post-Installation	\$0	\$0
Total Savings	\$7,486	\$7,486

Note 1: Energy savings based upon Task Order 2 utility costs.

Note 2: The analysis for this project was done by determining the contribution from the solar domestic water panels.

Note 3: It is assumed that the heat provided by the solar panels is less than the total domestic hot water heating requirement.

4. UTILITY, ENVIRONMENTAL OR OTHER IMPACT

Environmental permits will not be required for the implementation of this ECSM.

The operations and maintenance requirements associated with the refurbished solar domestic hot water system are assumed to be the same as the requirements for the existing domestic hot water system and will be responsibility of MCAGCC Twentynine Palms.

No hazardous waste will be generated as a result of implementing this project.

ECSM 4: ENERGY MANAGEMENT CONTROL SYSTEM UPGRADE

ECSM Recommended Only in Alternate Scenario

Johnson Controls understands that MCAGCC Twentynine Palms will realize significant benefits by replacing the obsolete Honeywell system and expanding the new system. Given the installation costs, the energy savings based utility rates agreed to for Project 2 (cogen), and the limited non-energy savings that are available, we are unable to recommend that this ECSM be included in this project. However, Johnson Controls has developed an alternate financial scenario based on current utility rates and a total project scope whereby this ECSM would be worthy of development. See the Price Proposal for the financial details of this alternate scenario.

EXECUTIVE SUMMARY

This ECSM will replace the MCAGCC Twentynine Palms Honeywell 7600 series energy management control system (EMCS) controllers and software with modern systems in the 149 buildings currently connected to the EMCS. The EMCS will also be expanded to include 13 additional buildings.

1. IDENTIFICATION AND DESCRIPTION

MCAGCC Twentynine Palms has a Honeywell EMCS connected to 149 buildings that use 7600 series controllers. Honeywell is no longer manufacturing 7600 controllers and replacement parts and components are no longer available.

The new EMCS controllers and software will provide additional capability and applications that will be used to operate the buildings more efficiently while providing a more comfortable environment. The new EMCS capabilities will address the following:

- The existing system provides on/off scheduling control for lighting and heating, ventilating, and air conditioning (HVAC) equipment throughout much of the main base and limited temperature control in some buildings. Generally, there is one lighting schedule and one HVAC schedule per building. As a result, the equipment operation is set to meet the longest occupancy schedule for the building rather than the specific occupancy schedule for the area served by a specific system.
- The current system does not have a graphic interface at the front-end controller.
- The existing system has no monitoring capability and the only way the operators can control equipment from the front-end controller is to change the programmed operating schedule.

The new EMCS will also be expanded to the following buildings: 692, 693, 696, 1024, 1031, 1082, 1533, 1565, 1616, 1630, 1711, 1927, and 2350.

2. DETAILED ECONOMIC ANALYSIS

Electricity costs were developed from the Southern California Edison TOU-8 rate schedule effective on April 9, 2000. Electricity costs for this project take into account the time of day and period of the year during which savings will occur. Site personnel provided the natural gas prices used for this project.

A comprehensive energy study was performed in 1996 by the engineering firm subcontracted for this Site Survey Report. The 1996 study used DOE 2 simulations to model HVAC energy use in typical buildings at the base. These models were used to calculate energy use for each of the buildings in the main base. The resultant models were calibrated against historical utility data. A second set of models that accounted for the effects of recommended lighting efficiency improvement projects was also prepared. An EMCS upgrade was evaluated in the 1996 study.

The results of the DOE 2 models that accounted for the lighting retrofits were used as the baseline for the current study. The EMCS DOE 2 model results were revised to reflect current conditions and then used to determine the current savings potential. The savings are based primarily on providing unique operating schedules for each HVAC system to match the occupancy of the area served by the system. Additional savings will result through improved temperature control. The analysis is based on temperature limits through the use of centralized temperature sensors in each building. The analysis does not include direct digital control at the zone temperature level or additional lighting controls that would generate additional savings. If further developed, the cost effectiveness of these control augmentations will be evaluated.

3. ENERGY SAVINGS PROPOSED

The estimated savings and implementation costs for this ECSM are presented in the Table 1.

Table 1: Financial Overview

Electric Savings kWh/yr.	Natural Gas Savings (therms/ yr)	Saving \$/yr.	Implementation Cost	Simple Payback (yrs)
2,896,098	147,214	\$182,148	\$4,760,100	26.1

Note: Energy savings based upon Task Order 2 utility costs

4. UTILITY, ENVIRONMENTAL OR OTHER IMPACT

Environmental permits will not be required for the implementation of this ECSM.

Operations and maintenance procedures will be necessary for this ECSM. It is assumed that these will be less than or equal in costs to the current operation and maintenance requirements will continue to be the responsibility of MCAGCC Twentynine Palms.

No hazardous waste will be generated as a result of implementing this project.

ECSM 5: ONE MW WIND TURBINE GENERATOR SYSTEM

ECSM Recommended Only in Alternate Scenario

Given the installation costs, the energy savings based utility rates agreed to for Project 2 (cogen), and the limited non-energy savings that are available, we are unable to recommend that this ECSM be included in this project. However, Johnson Controls has developed an alternate financial scenario based on current utility rates and a total project scope whereby this ECSM would be worthy of development. See the Price Proposal for the financial details of this alternate scenario.

EXECUTIVE SUMMARY

This ECSM will install four 250-kW wind turbine generators to produce electricity and reduce the amount purchased electricity.

1. IDENTIFICATION AND DESCRIPTION

Currently, the site does not have any wind turbine generators. Electricity generation from wind is technically feasible at this site, although manufacturers have expressed concern over sufficient wind speed at the base. Wind speed data is collected at ground level and logged at the EAF. For every month, the data are broken down to show the percentage of time the wind speed was within a specific range.

The wind turbine generator that was sized for this application, Lagerwey Windturbine 30/250, has a 30 meter diameter rotor and a rated output of 250 kW at 27 mph. Power output for this wind turbine can be expressed as a 4th degree polynomial function of wind speed. As the wind speed decreases, the power output decreases exponentially. The unit requires 9.8 mph of wind to start generation. For the last 12-month period at the site, the average wind speed was 9.9 mph. Approximately 40% of the time, the wind speed is high enough to be used for wind energy. Note that wind speeds vary with height and it will be necessary to establish a wind sensor array at potential wind turbine sites to establish a wind profile on which to confidently estimate the savings potential of this ECSM.

2. DETAILED ECONOMIC ANALYSIS

The economic analysis for the site evaluated the costs of hardware and installation and potential electricity cost savings. The analysis assumed 10% losses for turbine blade fouling, array losses, breakdowns, and other miscellaneous losses. Also, it was assumed that generation would not necessarily occur during the peak hours of the day and therefore, no demand savings are included. The RETSCREEN Excel-based software tool developed by the Canadian Government, with the support of NASA, for UNEP was used to estimate the costs and savings associated with this ECSM.

3. ENERGY SAVINGS PROPOSED

The estimated savings and implementation costs for this ECSM are presented in the Table 1.

Table 1: Financial Overview

Elect. Saving (kWh/yr)	Saving (\$/yr)	Implementation Cost	Simple Payback (yrs)	Renewable Energy Rebate	Simple Payback (yrs)
2,386,209	\$128,378	\$5,438,063	42.4	\$2,719,031	21.2

Note: Energy savings based upon Task Order 2 utility costs

4. UTILITY, ENVIRONMENTAL OR OTHER IMPACT

Environmental permits may be required for the implementation of this ECSM and will be the responsibility of Johnson Controls.

Additional operations and maintenance requirements are associated with this ECSM and will be determined during the Feasibility Study.

No hazardous waste will be generated as a result of implementing this project.

ECSM 6: AIR CONDITIONING SYSTEM UPGRADES

ECSM Recommended Only in Alternate Scenario

Johnson Controls understands that MCAGCC Twentynine Palms will realize operational benefits with the installation of this ECSM. Given the installation costs, the energy savings based utility rates agreed to for Project 2 (cogen), and the limited non-energy savings that are available, we are unable to recommend that this ECSM be included in this project. However, Johnson Controls has developed an alternate financial scenario based on current utility rates and a total project scope whereby this ECSM would be worthy of development. See the Price Proposal for the financial details of this alternate scenario.

EXECUTIVE SUMMARY

An ECSM that will modifying air-cooled, direct-expansion air conditioning systems to use chilled water was evaluated. This ECSM would include expanding existing chilled water loops and installing new chilled water plants and distribution systems.

1. IDENTIFICATION AND DESCRIPTION

The existing water-cooled, reciprocating chillers at this site have an efficiency in the range of 0.8 to 0.9 kW per ton. The typical efficiency of air-cooled, direct-expansion condensing units in the age range of the units at this site is 1.4 kW per ton (including the condenser fan power). New water-cooled centrifugal chillers are available with an efficiency of 0.5 kW per ton. The chilled water pumps, condenser water pumps, and cooling tower fans add approximately 0.15 kW per ton to the overall chilled water system load. Therefore, converting from air-cooled, direct-expansion cooling to water-cooled chillers will reduce the power and energy required for air conditioning. Centralized chilled water plants in combination with air handlers with chilled water coils generally require less maintenance and provide better comfort conditions than distributed air-cooled, direct-expansion cooling systems.

1.1 Expand Existing Chilled Water Loops

Two 155-ton capacity chillers are located in Building 1531. The chillers supply chilled water to Buildings 1531 and 1532. Air-cooled condensing units that supply air handlers with direct expansion coils condition building 1542. The typical air conditioning capacity for these types of buildings is one ton of cooling per 400 square feet of conditioned building space. At that level, the required cooling capacity for all three buildings is 112 tons. Therefore, the existing chillers have sufficient capacity to condition all three buildings.

Building 1859 has a 150-ton capacity, water-cooled chiller. Variable-air-volume air handlers condition building 1865 with dedicated compressors and direct-expansion cooling coils. The required cooling capacity for both buildings is approximately 117 tons. Therefore, the chiller in Building 1859 has sufficient capacity to condition both buildings.

Barracks 1462 through 1467 are served by a newly installed, 265-ton capacity, water-cooled centrifugal chiller and two 201-ton capacity gas engine chillers. Building 1569T has two 165-ton capacity, water-cooled reciprocating chillers. The chillers in 1569T serve Buildings 1551, 1554, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, and 1573. There is a chilled water inter-tie between Building 1569T and the 1460 series buildings, so any of these chillers can serve either loop. According to the site engineering staff, the new 265-ton capacity chiller is conditioning all of the above buildings most of the time. There is also an abandoned chilled water line between Buildings 1562 and 1559 that the site is planning to reactivate. In addition, the engineering staff expressed an interest in connecting Buildings 1541, 1584, and 1591 to the 1569T chilled water distribution. The combined area of the buildings currently connected to the two chilled water loops is 400,237 square feet. The total chiller capacity for the two loops is 997 tons. This corresponds to 400 square feet per ton of cooling capacity, which is a typical ratio. Conditioning all of these buildings with the 265-ton capacity chiller corresponds to 1,510 square feet per ton. The combined area of the buildings MCAGCC Twentynine Palms would like to add to the chilled water system is 53,814 square feet, which would require an additional 135 tons of cooling capacity at 400 square feet per ton of cooling.

1.2 Install New Chilled Water Plants

Roof-mounted package units with direct-expansion cooling condition barracks 1627, 1636, and 1645. Package units condition buildings 1825, 1826, 1828, 1831, 1833, 1839, 1843, and 1847 with direct expansion cooling. Building 1848 has a 110-ton capacity chiller that supplies air handlers located in the building.

The feasibility of installing one chilled water plant for the 1600 series buildings and one plant for the 1800 series buildings was evaluated. Using 400 square feet per ton, the 1800 buildings would require 197 tons of cooling capacity. Using 1,000 square feet per ton for a barracks type building and (based on the total area of the 1460 barracks being served by a 265-ton capacity chiller, the 1600 series barracks would require 215 tons of cooling capacity.

2. DETAILED ECONOMIC ANALYSIS

Savings for all of the above projects were developed using the results of DOE 2 simulations from a prior energy study for MCAGCC Twentynine Palms.

3. ENERGY SAVINGS PROPOSED

The savings and implementation costs are presented in the Table 1.

Table 1: Savings and Implementation Costs

Project	Elect. Savings (kWh/yr)	Savings (\$/yr)	Implementation Cost	Simple Payback (yrs)
Add Buildings to the 1569T Chiller Loop	167,542	\$18,095	\$263,455	14.6
Add Building 1542 to Chiller in Building 1531	43,153	\$4,661	\$184,419	39.6
Add Building 1865 to Chiller in Building 1859	15,290	\$1,651	\$74,387	45.1
Install Chilled Water Plant for 1800 Block	181,597	\$19,612	\$1,104,962	56.3
Install Chilled Water Plant for 1600 Block	207,826	\$22,445	\$1,183,996	52.8
Total	615,408	\$66,464	\$2,811,219	42.3

Note: Energy savings based upon Task Order 2 utility costs.

4. UTILITY, ENVIRONMENTAL OR OTHER IMPACT

Environmental permits will not be required for the implementation of this ECSM.

The operations and maintenance requirements associated with this ECSM are assumed to be the same as the requirements for the existing systems and will continue to be the responsibility of MCAGCC Twentynine Palms.

No hazardous waste will be generated as a result of implementing this project.

ECSM 7: GROUND SOURCE HEAT PUMPS

Not Recommended

Given the installation costs, the energy savings based utility rates agreed to for Project 2 (cogen), and the limited non-energy savings that are available, we are unable to recommend that this ECSM be included in this project. Johnson Controls also evaluated this ECSM under the more favorable current SCE TOU-8 rate tariff and included assumptions regarding operational and maintenance savings. The result of this evaluation was that this ECSM continued to be uneconomical. Therefore, this ECSM has not been included in the alternate financial scenario in the Price Proposal.

EXECUTIVE SUMMARY

Family housing units in Joshua Heights, Shadow Mountain, Condor Terrace and Ocotillo Heights are conditioned by split system air conditioners and natural gas fired furnaces. The feasibility of replacing the air conditioning systems with ground source heat pumps was evaluated.

1. IDENTIFICATION AND DESCRIPTION

Ground source heat pumps extract heat from the ground during the winter and reject heat to the ground during the summer. This is accomplished by circulating water through a piping system buried in the ground. At 29 Palms it is anticipated that the piping system would have to be placed in bores approximately 200 feet deep. Standard practice is to use polyethylene pipe to avoid problems with corrosion. Ground source heat pumps are generally more effective than the typical air source heat pumps because the ground temperature is cooler than the air temperature during the summer and warmer than the air temperature during the winter.

2. DETAILED ECONOMIC ANALYSIS

The analysis was based on typical equipment capacities and efficiencies for the existing equipment and manufacturer ratings for the ground source heat pumps. Full load operating hours were taken from DOE 2 simulations of residential buildings in a high desert climate. Cost estimates were based on RS Means Cost Estimating manuals and an Excel based evaluation software tool called RETSCREEN. The Canadian Government developed the RETSCREEN software for UNEP, with the support of NASA, for conducting preliminary feasibility assessments of renewable energy projects.

3. ENERGY SAVINGS PROPOSED

The results of the analysis indicated annual savings of \$163 per residence at a cost of \$8,020 for a simple payback period of 49.2 years. Extrapolating these results to 520 residences gives total annual savings of \$84,760 and an installation cost of \$4,170,400 or a simple payback of 49.2 years.

PRELIMINARY MEASUREMENT AND VERIFICATION PLAN

BASELINE ENERGY RATES

For the purposes of this Site Survey Report, Johnson Controls has used the same electricity and natural gas rates as presented in the Final Proposal for Project 2 (cogen) for MCAGCC Twentynine Palms.

Table 1 presents an overview of the recommended M&V Option for each ECSM. The recommended approaches are based on FEMP's "Measurement and Verification (M&V) Guideline for Federal Energy Projects."

Table 1: Recommended M&V Approach

ECSM	Option/Method	Notes
ECSM 1: Waste Water Treatment Plant Pump VFDs	Option B, Method VSD-B-01	
ECSM 2: Skylights and Daylighting Control	Option C, Computer Simulation Analysis	
ECSM 3: Domestic Water Solar Heating Refurbishment	Option B Generic Variable Load: Continuous Post-Installation Metering, Method GVL-B-01.	
ECSM 4: Energy Management Control System Upgrade	Option C, Computer Simulation Analysis	Recommended only in alternate scenario
ECSM 5: 1 MW Wind Turbine Generator System	Option B Generic Variable Load: Continuous Post-Installation Metering, Method GVL-B-01	Recommended only in alternate scenario
ECSM 6: Air Conditioning System Upgrades	Option B Chiller Replacement: Metering of Chiller kW, Method CH-B-01	Recommended only in alternate scenario
ECSM 7: Ground Source Heat Pumps	N/A	Not recommended, no approach presented

Note: See the Price Proposal for details of the alternate scenario.

ECSM 1: WASTE WATER TREATMENT PLANT PUMP VFDS

The recommended measurement and verification (M&V) approach for this ESCM is based upon FEMP's "Measurement and Verification (M&V) Guideline for Federal Energy Projects," Option B, Method VSD-B-01.

1. BASELINE ENERGY USE

During the feasibility study, all affected pump motors will be continuously monitored for a period of one-week. A sample rate will be used that enables the determination of coincident energy and power use of all monitored equipment as well as pump flow rates. Results of the data will be correlated to existing waste water treatment flow data, extrapolated to a one year period and the baseline rate tariff used to establish:

- Baseline energy and power use according to the applicable billing month and time-of-use period for the baseline rate tariff
- Baseline energy and power costs determined from the application of the baseline rate tariff

Existing waste water treatment flow rate records as corrected due to calibration will become a stipulated baseline component for use in the post-installation M&V.

2. POST-INSTALLATION MEASUREMENT & VERIFICATION

For this ESCM, it is recommended that the post-installation M&V will be performed using the same monitoring period and sample rate used to establish the baseline. The results will be extrapolated to a one year period and the baseline rate tariff used to establish:

- Post-installation energy and power use according to the applicable billing month and time-of-use period for the baseline rate tariff
- Post-installation energy and power costs determined from the application of the baseline rate tariff

Actual savings obtained with the installation of this ESCM will be calculated by subtracting the post-installation energy and power costs from the baseline energy and power costs.

It is recommended M&V be performed once during commissioning and prior to acceptance, with the results of the M&V stipulated for the term of the Task Order.

ECSM 2: SKYLIGHTS AND DAYLIGHTING CONTROL

The recommended measurement and verification (M&V) approach for this ESCM is based upon FEMP's "Measurement and Verification (M&V) Guideline for Federal Energy Projects," Option C, Computer Simulation Analysis.

1. BASELINE ENERGY USE

During the feasibility study, each affected building will be surveyed and the inputs necessary for the SkyCalc program verified. Lighting power use and other impacted energy systems will be determined using short-term (instantaneous) measurements. The intent of the short-term measurements is to calibrate the SkyCalc models' simulated baselines for each building. A blended rate representative, based upon the baseline utility tariff, will be used to calculate the baseline energy costs. This blended rate will be established on the average power use for each applicable time-of-use rate period for all of the affected buildings.

2. POST-INSTALLATION MEASUREMENT & VERIFICATION

Each year, beginning one year after acceptance, a statistically significant sample of the affected buildings will be surveyed to verify that the daylighting controls are functional. If a lighting control is found to be defective it will be assumed to have failed at a date equivalent to one-half of the elapsed time since the last M&V survey or the elapsed time between the sensor's failure was identified to Johnson Controls and its restoration to service. Based upon this failure date, the SkyCalc program's simulated savings will be adjusted to reflect the failed lighting control. The results of this adjustment will be extrapolated to the entire building population and the post-installation energy costs calculated using the same blended rate used to calculate baseline energy costs.

Actual savings obtained with the installation of this ECSM will be calculated by subtracting the post-installation energy and power costs from the baseline energy and power costs.

ECSM 3: DOMESTIC WATER SOLAR HEATING REFURBISHMENT

The recommended measurement and verification (M&V) approach for this ECSM is based upon FEMP's "Measurement and Verification (M&V) Guideline for Federal Energy Projects," Option B Generic Variable Load: Continuous Post-Installation Metering, Method GVL-B-01.

1. BASELINE ENERGY USE

During the feasibility study, each building's domestic hot water energy usage will be continuously monitored for a period of one-week. A sample rate will be used that enables the determination of hot water energy use and correlated to each building's occupancy for the period monitored. Gas usage will be adjusted to reflect the generator efficiency and the results extrapolated to a one-year period using an agreed and stipulated annual building occupancy. The baseline gas rate will be used to establish the baseline energy costs.

The stipulated building occupancies will be used in the post-installation M&V.

2. POST-INSTALLATION MEASUREMENT & VERIFICATION

For this ECSM, it is recommended that the post-installation M&V be performed using the same monitoring period and sample rate as used to establish the baseline. Each building's domestic hot water energy usage as supplied by the restored solar system will be measured. This measured energy use will be adjusted for occupancy and using the generator efficiency applied to the baseline, extrapolated to a one-year period to determine the total avoided gas usage.

Actual savings obtained with the installation of this ECSM will be calculated by subtracting the post-installation energy and power costs from the baseline energy and power costs.

It is recommended M&V be performed once during commissioning and prior to acceptance, with the results of the M&V stipulated for the term of the Task Order.

ECSM 4: ENERGY MANAGEMENT CONTROL SYSTEM UPGRADE

ECSM Recommended Only in Alternate Scenario

The recommended measurement and verification (M&V) approach for this ESCM is based upon FEMP's "Measurement and Verification (M&V) Guideline for Federal Energy Projects," Option C, Computer Simulation Analysis.

1. BASELINE ENERGY USE

During the feasibility study, sampling groups will be established. These sample groups will be defined as:

- Buildings with existing Honeywell control systems.
- Typical buildings according to the primary functional use and construction. These typical buildings will be sub-categorized based upon the differing types of mechanical equipment used. Establishing the need for sub-categories will be based upon significant simulated energy differences due to the types of mechanical equipment installed.

With the sample groups defined, a statistically significant sample of the existing Honeywell controlled buildings will be surveyed to establish the degree of functional control that is provided by each building's control system. In addition, a statistically significant sample of the typical buildings and sub-categories will be surveyed and short-term measurements taken to establish whole building energy use and major equipment energy use. The period of measurement will be determined as a function of the variable nature of the equipment under consideration. The results of the survey will be used to calibrate the typical building simulations to the whole building measurements. Energy and power use results from the simulations will be extrapolated to the entire building population comprising the scope of this ESCM. The baseline rate tariff will be used to establish:

- Baseline energy and power use according to the applicable billing month and time-of-use period for the baseline rate tariff
- Baseline energy and power costs determined from the application of the baseline rate tariff

2. POST-INSTALLATION MEASUREMENT & VERIFICATION

Each year, beginning one year after Acceptance, a statistically significant sample from each of the typical building sample groups will be surveyed to verify that the installed EMCS is functional. If an EMCS is found to be defective, the following will be determined:

The degree of functional control remaining and an assumed failure date equivalent to one-half of the elapsed time since the last M&V survey or the elapsed time that the EMCS failure was identified to Johnson Controls and its restoration to service. Based upon this failure date, the simulated savings will be adjusted to reflect the degree of the EMCS failure of the affected unit or units. The

results of this adjustment will be extrapolated to the entire sample group's population and the post-installation energy costs calculated using the same baseline rate tariff as used to calculate baseline -energy and power use and costs.

Actual savings obtained with the installation of this ECSM will be calculated by subtracting the post-installation energy and power costs from the baseline energy and power costs.

ECSM 5: ONE MW WIND TURBINE GENERATOR SYSTEM

ECSM Recommended Only in Alternate Scenario

The recommended measurement and verification (M&V) approach for this ESCM is based upon FEMP's "Measurement and Verification (M&V) Guideline for Federal Energy Projects," Option B Generic Variable Load: Continuous Post-Installation Metering, Method GVL-B-01.

1. BASELINE ENERGY USE

Potential wind farm sites will be selected in consultation with MCAGCC Twentynine Palms personnel and wind sensor arrays installed to log wind speeds at varying heights to establish:

- Local wind speeds as a function of the wind data presently available
- Annual wind speed profiles for the purposes of calculating energy generation potential of each selected site

The maximum power output of the wind farm is significantly less than the base's minimum power requirements.

2. POST-INSTALLATION MEASUREMENT & VERIFICATION

On a continuous basis, for the term of the Task Order, the power output of the wind turbine generator system will be continuously measured and totaled according to the SCE TOU-8 rate tariff. Totals will be maintained as per the rate tariff's time-of-use definitions and the applicable energy and demand rate applied to calculate the total purchased utility electricity costs avoided. The purchased utility electricity costs avoided will be considered the Actual Savings.

ECSM 6: AIR CONDITIONING SYSTEM UPGRADES

ECSM Recommended Only in Alternate Scenario

The recommended measurement and verification (M&V) approach for this ECSM is based upon FEMP's "Measurement and Verification (M&V) Guideline for Federal Energy Projects," Option B Chiller Replacement: Metering of Chiller kW, Method CH-B-01.

1. BASELINE ENERGY USE

To establish the baseline for this ECSM, a detailed load study for each building will be conducted. In addition, the chillers that will have additional building loads connected will be continuously monitored to determine their baseline maximum loads. Spot-measurements to determine kW/Ton ratings will be taken on the existing equipment that is to be eliminated by this ECSM. The results of these two activities will demonstrate whether existing chillers have sufficient capacities to meet the intended load additions.

Baseline energy use and costs will be calculated using the results of the load study, the short-term measurements of the existing equipment, and the baseline rate tariff.

If it is determined additional capacity is required, Johnson Controls will seek direction on further activity regarding the continued development of this ECSM. It is anticipated that such an event will significantly increase the installation cost for this ECSM.

2. POST-INSTALLATION MEASUREMENT & VERIFICATION

For the situation where no new chillers are required, Johnson Controls proposes that the load study be repeated during the Implementation Phase to confirm the additional loads added to the existing chillers are within their capacity. If adequate capacity is confirmed, then the proposed savings will be considered the Actual Savings and stipulated for the term of the Task Order. If the load is found to be greater than the capacity of the chillers, then Johnson Controls will, with consideration for facility operational changes, adjust the loads and/or available chiller capacity to match the load with the chillers. Actual Savings will be adjusted depending on the corrections made.

If during the feasibility study, it is determined that additional chiller capacity is required, then Johnson Controls recommends that in addition to the above, short term measurement of the installed chillers be taken. These measurements will determine the installed kW/ton performance of the installed chillers and the Actual Savings adjusted accordingly. The results of these measurements will be stipulated for the term of the Task Order.

PRICE PROPOSAL

SUMMARY

Johnson Controls is pleased to provide this Price Proposal for an ESPC project at MCAGCC Twentynine Palms. We have prepared two sets of price schedules. The Standalone scenario, using the Task Order 2 utility rates, includes ECSMs 1, 2 and 3 and provides a project with a 19-year term. The Alternate scenario, using the current electric rate, includes ECSMs 1, 2, 3, 4, 5 and 6 combined with the two ECSMs considered for Task Order 2, resulting in an 11-year term, excluding implementation. The attached price schedules H-1 through H-5 provide the required details for both scenarios for this Site Survey Report.

STANDALONE TASK ORDER

The Standalone H-Schedules include the ECSMs recommended for further development (ECSMs 1, 2 and 3) based upon the Natural Gas rate of \$0.38 /therm and the Southern California Edison TOU-8 (2-50kV) rate tariff in effect in the year 2000. These are the rates applied in the Task Order 2 Final Proposal.

The following are the financial assumptions used in the preparation of the preparation of the price schedules:

- Total Investment: \$480,168 including implementation period interest
- Implementation Price: \$459,869
- Financing Procurement Cost: \$20,299
- Interest Rate: 8.67%. Rate to be finalized prior to award
- Estimated Energy Annual Cost Savings: \$54,405
- Estimated Energy related O&M Annual savings: \$0
- Estimated Annual Cost Savings: \$54,405
- Guaranteed First Year Energy Cost Savings: \$54,405
- Implementation Period Savings: \$0
- Assumed Project Award Date: April 1, 2002
- Project Closeout/Acceptance Completed: August 1, 2002
- Invoice to Government for First Contractor Payment: September 1, 2002
- Total implementation period is 6 months
- Contractor Payments: Monthly in Arrears
- Annual Energy Cost Escalation: 2.26%
- Annual Service and O&M Cost Escalation: 3.49%

COMBINED TASK ORDERS—ALTERNATE SCENARIO

The Alternate H-Schedules (11-year term, excluding implementation) also uses the Natural Gas rate of \$0.38 /therm, but uses the currently published Southern California Edison TOU-8 (2-50kV) rate tariff. The difference between the current and the year 2000 rates are shown in the following table:

Effective period of TOU-8 (2-50kV) Rate Tariff	Consumption (\$/kWh)				
	Summer			Winter	
	On-Peak	Mid-Peak	Off-Peak	Mid-Peak	Off-Peak
Year 2000 Rate	0.09422	0.05847	0.03758	0.07071	0.03874
Currently Published	0.19544	0.10897	0.08808	0.12121	0.08924

Note: An additional \$.01/kWh surcharge is applied to each TOU period in the currently published rate tariff.

The Alternate H-Schedules assume that the Task Order 2 Award is made with the application of the currently published TOU-8 (2-50kV) rate tariff. As such, Task Order 2 ECSM 1: Cogeneration is included, reflecting a dramatic upward change in the annual savings. This upward change in savings, enables the inclusion of the following ECSMs in this project:

- ECSM 1: Waste Water Treatment Plant Pump VFD
- ECSM 2: Skylights and Daylighting Control
- ECSM 3: Domestic Water Solar Heating Refurbishment
- ECSM 4: Energy Management Control System Upgrade
- ECSM 5: 1 MW Wind Turbine Generator System
- ECSM 6: Air Conditioning System Upgrades
- Hospital Loop Extension (presented in Site Survey Report for Project 2)

Another important difference between the two financial scenarios is the assumption of responsibility for repair and maintenance. In the Alternate scenario, Johnson Controls will assume full repair and replacement responsibility, plus full maintenance responsibility for the Energy Management Control System and the 1 MW Wind Turbine, as well as for the Cogeneration System. In addition, Johnson Controls has assumed that a dedicated person to oversee the Energy Management Control System is also desired by MCAGCC Twentynine Palms.

The following details the financial assumptions for this alternate scenario's price schedules:

- Total Investment: \$37,043,109 including implementation period interest
- Implementation Price: \$32,540,970

- Financing Procurement Cost: \$4,502,139
- Interest Rate: 8.67%. Rate to be finalized prior to award
- Estimated Energy Annual Cost Savings: \$6,921,584
- Estimated Energy related O&M Annual savings: -\$3,106
- Estimated Annual Cost Savings: \$6,918,478
- Guaranteed First Year Energy Cost Savings: \$6,247,553
- Implementation Period Savings: \$363,317 (determined from 2 months of performance prior to Acceptance, calculated based on Guaranteed first year savings and paid at Acceptance).
- Assumed Project Award Date: July 1, 2002
- Project Closeout/Acceptance Completed: December 1, 2003
- Invoice to Government for First Contractor Payment: January 1, 2004.
- Total implementation period is 18 months.
- Contractor Payments: Monthly in Arrears.
- Annual Energy Cost Escalation: 1.24% (applied to savings starting at Award Date).
- Annual Service and O&M Cost Escalation: 3.49%

Johnson Controls did not attempt to calculate a site-specific rate tariff to reflect a blend of on-site generation (cogeneration) and purchased utilities. One important aspect of this calculation is the assignment of value to the waste heat output of the cogeneration system. An example of how this valuation may impact investment decisions is as follows. If the waste stream is valued at \$0 / therm, then the appropriateness of the Domestic Water Solar Heating Refurbishment ECSM may be questionable as no monetary savings could be obtained with the implementation of this ECSM.

APPROACH TO ESCALATION

A 3.49% escalation factor is applied to the annual costs during the service phase of the project. This forecast for cost escalation is based on the anticipated trend for general inflation over the contract term and is based on data from the Bureau of Labor Statistics.

The escalation factors for energy and ancillary cost savings is a conservative factor calculated as an aggregate factor weighted for electricity, natural gas and O&M cost escalation at the anticipated average cost escalation. The energy data presented in the Government's publication, reference number NISTIR 85-3273-16 (rev. 4/ 01), entitled Energy Price Indices and Discount Factors for Life-Cycle Cost Analysis - April 2001 is the basis for energy escalation factor. Johnson Controls uses this simplified approach in applying escalation to its first year cost savings. Hence, Johnson Controls proposes escalation of the cost savings to be stipulated over the term of the contract.

TITLE

Title to the Johnson Controls installed equipment and improvements furnished under this Task Order shall pass to the Government upon acceptance of the installation as complete. Johnson Controls will remain responsible for all performance requirements specified in the Task Order including repairs, operations and maintenance of the installed equipment, as described within this proposal. The financier of the installed energy conservation measures may retain a security interest in the equipment and improvements, subject to and subordinate to the rights of the Government.

In no event shall such security interest allow unlimited access to MCAGCC Twentynine Palms for the purpose of disabling or removing any equipment or systems without written permission from the MCAGCC Twentynine Palms Contracting Officer. Johnson Controls may be required to assign to the financing source its rights and responsibilities under this Task Order including rights to payments by the Government in the event of default by Johnson Controls.

STANDALONE TASK ORDER

SCHEDULE H-1 -- DELIVERY ORDER
Proposed Guaranteed Performance and Annual Contractor Payments

The Contractor shall complete the following statement:

If selected the Contractor shall complete the installation of all proposed ECSMs not later than 6 months after delivery order award.

Project Site: MCAGCC Twentynine Palms	Delivery Order No.: 3 (Standalone)		Contractor Name: Johnson Controls, Government Systems LLC	
Performance Period Year	(a) Estimated Annual Cost Savings \$	(b) Proposed Guaranteed Annual Cost Savings \$	(c) Total Annual Contractor Payments \$	(d) Govt Share of Guaranteed Savings (b) - (c) \$
ONE	\$ 54,405	\$ 54,405	\$ 54,405	\$ -
TWO	\$ 55,632	\$ 55,632	\$ 55,632	\$ -
THREE	\$ 56,887	\$ 56,887	\$ 56,887	\$ -
FOUR	\$ 58,170	\$ 58,170	\$ 58,170	\$ -
FIVE	\$ 59,482	\$ 59,482	\$ 59,482	\$ -
SIX	\$ 60,824	\$ 60,824	\$ 60,824	\$ -
SEVEN	\$ 62,195	\$ 62,195	\$ 62,195	\$ -
EIGHT	\$ 63,598	\$ 63,598	\$ 63,598	\$ -
NINE	\$ 65,033	\$ 65,033	\$ 65,033	\$ -
TEN	\$ 66,500	\$ 66,500	\$ 66,500	\$ -
ELEVEN	\$ 68,000	\$ 68,000	\$ 68,000	\$ -
TWELVE	\$ 69,533	\$ 69,533	\$ 69,533	\$ -
THIRTEEN	\$ 71,102	\$ 71,102	\$ 71,102	\$ -
FOURTEEN	\$ 72,705	\$ 72,705	\$ 72,705	\$ -
FIFTEEN	\$ 74,345	\$ 74,345	\$ 74,345	\$ -
SIXTEEN	\$ 76,022	\$ 76,022	\$ 76,022	\$ -
SEVENTEEN	\$ 77,737	\$ 77,737	\$ 77,737	\$ -
EIGHTEEN	\$ 79,490	\$ 79,490	\$ 79,490	\$ -
NINETEEN	\$ 81,283	\$ 81,283	\$ 78,959	\$ 2,324
TOTALS	\$ 1,272,943	\$ 1,272,943	\$ 1,270,619	\$ 2,324
(a) The technical proposal and Schedule H-4 supports this estimate of annual cost savings as "REASONABLE." (b) The "PROPOSED GUARANTEED ANNUAL COST SAVINGS" is based on achieving contractors guaranteed performance per site-specific M&V Plan agreed to in delivery order. (c) The contractor payment represent the delivery order price and should be supported by information submitted in Schedules H-2 and H-3. (d) Annual Cost Savings are escalated by 2.26% every year.				

SCHEDULE H-2 -- DELIVERY ORDER
Implementation Price by ECSM, Technology Category, and Delivery Order

Note: Use a separate page for ECSMs in the same technology category. Provide Delivery Order Total on the last page.

Project Site: MCAGCC Twentynine Palms			Delivery Order No.: 3 (Standalone)		Contractor Name: Johnson Controls, Government Systems LLC		
Tech No.	ECSM No.	ECSM Description Title	(a) Survey, Feasibility & Design Expense (\$)	(b) Construction Expense (\$)	(c)=(a)+(b) Total Implementation Expense (\$)	(d) Implementation Margin (Not to Exceed B-1) (%)	(e) = (c) x (1+d/100) Implementation Price (\$)
3	1	Waste Water Treatment Plant VFD	\$ 15,400	\$ 121,204	\$ 136,604	35%	\$ 184,416
4	2	Skylights and Daylighting Control	\$ 19,400	\$ 134,495	\$ 153,895	25%	\$ 192,369
6	3	Domestic Water Solar Heating Refurbishment	\$ 15,600	\$ 48,311	\$ 63,911	30%	\$ 83,084
Delivery Order Total							\$ 459,869

SCHEDULE H-3 -- DELIVERY ORDER
Contractor Cash Flow

Note: Add columns to Schedule H-3 so that all years in the performance period are shown.

Project Site: MCAGCC Twentynine Palms	Delivery Order No.: 3 (Standalone)		Contractor Name: Johnson Controls, Government Systems LLC																	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	
AMOUNT FINANCED																				
Implementation Price (H-2, col. e, DO total) (\$)	\$ 459,869																			
Financing Procurement Price (\$)	\$ 20,299																			
Total Amount Financed (\$)	\$ 480,168																			
ANNUAL CASH FLOW (PERFORMANCE PERIOD)																				
Debt Service:																				Totals
Interest (\$)	\$ 41,484	\$ 41,109	\$ 40,618	\$ 39,999	\$ 39,238	\$ 38,322	\$ 37,233	\$ 35,958	\$ 34,475	\$ 32,764	\$ 30,804	\$ 28,570	\$ 26,037	\$ 23,175	\$ 19,952	\$ 16,335	\$ 12,287	\$ 7,765	\$ 2,727	\$ 548,852
Principal Payment (\$)	\$ 3,744	\$ 5,025	\$ 6,440	\$ 8,000	\$ 9,718	\$ 11,609	\$ 13,689	\$ 15,974	\$ 18,485	\$ 21,241	\$ 24,266	\$ 27,582	\$ 31,217	\$ 35,200	\$ 39,563	\$ 44,339	\$ 49,567	\$ 55,288	\$ 59,221	\$ 480,168
(a) Total Debt Service (\$)	\$ 45,228	\$ 46,134	\$ 47,058	\$ 47,999	\$ 48,956	\$ 49,931	\$ 50,922	\$ 51,932	\$ 52,960	\$ 54,005	\$ 55,070	\$ 56,152	\$ 57,254	\$ 58,375	\$ 59,515	\$ 60,674	\$ 61,854	\$ 63,053	\$ 61,948	\$ 1,029,020
Penalty if debt is retired at yearend (\$)	\$ 23,821	\$ 23,570	\$ 23,248	\$ 22,848	\$ 22,362	\$ 21,782	\$ 21,097	\$ 20,298	\$ 19,374	\$ 18,312	\$ 17,099	\$ 15,720	\$ 14,159	\$ 12,399	\$ 10,421	\$ 8,204	\$ 5,725	\$ 2,961	\$ -	\$ 303,400
Performance Period Expenses:																				
Management/Administration (\$)	\$ 3,000	\$ 3,105	\$ 3,213	\$ 3,325	\$ 3,441	\$ 3,561	\$ 3,685	\$ 3,814	\$ 3,947	\$ 4,084	\$ 4,227	\$ 4,374	\$ 4,527	\$ 4,685	\$ 4,848	\$ 5,017	\$ 5,192	\$ 5,373	\$ 5,561	\$ 78,979
Operation (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Maintenance (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Repair and Replacement (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Measurement and Verification (\$)	\$ 3,900	\$ 4,036	\$ 4,177	\$ 4,322	\$ 4,473	\$ 4,629	\$ 4,791	\$ 4,958	\$ 5,131	\$ 5,310	\$ 5,495	\$ 5,687	\$ 5,885	\$ 6,090	\$ 6,303	\$ 6,522	\$ 6,750	\$ 6,985	\$ 7,229	\$ 102,673
Permits and Licenses (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Insurance (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Property Taxes (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other (describe & itemize on attachment) (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
(b) Subtotal Performance Period Expenses (\$)	\$ 6,900	\$ 7,141	\$ 7,390	\$ 7,647	\$ 7,914	\$ 8,190	\$ 8,476	\$ 8,772	\$ 9,078	\$ 9,394	\$ 9,722	\$ 10,061	\$ 10,412	\$ 10,775	\$ 11,151	\$ 11,539	\$ 11,942	\$ 12,358	\$ 12,790	\$ 181,652
(c) Margin (not the exceed B-2) (%)	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	
(d) Performance Period Prices ((d)=(b) x (1+c/100))	\$ 9,177	\$ 9,498	\$ 9,829	\$ 10,171	\$ 10,526	\$ 10,893	\$ 11,273	\$ 11,666	\$ 12,073	\$ 12,495	\$ 12,930	\$ 13,381	\$ 13,848	\$ 14,330	\$ 14,830	\$ 15,348	\$ 15,883	\$ 16,437	\$ 17,011	\$ 241,599
(e) Total Annual Contractor Payment (e)=(a)+(d)	\$ 54,405	\$ 55,632	\$ 56,887	\$ 58,170	\$ 59,482	\$ 60,824	\$ 62,195	\$ 63,598	\$ 65,033	\$ 66,500	\$ 68,000	\$ 69,533	\$ 71,102	\$ 72,705	\$ 74,345	\$ 76,022	\$ 77,737	\$ 79,490	\$ 78,959	\$ 1,270,619

Submit the following as applicable to above debt service:
Total Annual Interest Rate: 8.67% (not to exceed B-3 plus T-Bill/T-Note reference)
T-Bill/T-Note Reference: Term 30 years; Issue Date 07/12/2001; Interest Rate 6.47%
Source: Federal Reserve Board Statistical Release H.15 (e.g. Wall Street Journal, web site)
Notes:
1 Project finance rate to be fixed at time of Award
2 Total Annual Contractor Payments are based upon monthly payments in arrears.
3 Contract term is 234 months.

SCHEDULE H-4 -- DELIVERY ORDER**Energy and Cost Savings by ECSM, Technology Category, and Delivery Order**

Note: Use a separate page for ECSMs in the same technology category. Provide Delivery Order Total on the last page.

Project Site: MCAGCC Twentynine Palms		Delivery Order No. : 3 (Standalone)				Contractor Name : Johnson Controls, Government Systems LLC			
		(a1) Electricity (\$/kWh)		(b1) Natural Gas (\$/therm)		(c1) Other _____ (\$/____)		(d1) Other _____ (\$/____)	
Baseline Energy Prices (provide supporting a attachments)									
Tech No.	ECM No.	(a) Electricity Savings (kWh/yr)	(b) Natural Gas Savings (therms/yr)	(c) Other _____ Savings (_____)	(d) Other _____ Savings (_____)	(e) = (a1)(a) + (b1)(b) + etc. Estimated Total Energy Cost Savings (\$/yr)	(f) Estimated Recurring Ancillary Cost Savings* (\$/yr)	(g) = (e) + (f) Estimated Total Recurring Cost Savings (\$/yr)	(h) = H-2 col.C + (e) Simple Payback (yr)
3	1	174,058	-	-	-	\$ 17,913	\$ -	\$ 17,913	10.30
4	2	281,296	(3,619)	-	-	\$ 29,006	\$ -	\$ 29,006	6.63
6	3	-	1,970	-	-	\$ 7,486	\$ -	\$ 7,486	11.10
Delivery Order Total		455,354	(1,649)	-	-	54,405	-	54,405	8.45

* One-time ancillary cost savings are listed in column (f) with an asterisk, and are not included in column or row totals with annually recurring energy and ancillary cost savings. All other entries in the one-time ancillary cost row are zero.

Note: 1kWh = 3,414 Btus

Utility rates applied are as used in the DO 2 Final Proposal. Consists of \$0.38 / therm for Natural Gas and Southern California Edison's TOU-8 2-50kV rate tariff.
Simple Payback - Sch. H-2 Installation Price divided by Total Savings

SCHEDULE H-5 DELIVERY ORDER
Guaranteed Savings, Price, and Cancellation Ceiling

The Contractor shall complete the following statement:

If selected the Contractor shall complete the installation of all proposed ECSM's not later than 6 months after delivery order award.

Project Site: Twentynine Palms MCAGCC	Delivery Order No. : 3 (Standalone)	Contractor Name: Johnson Controls, Government Systems LLC	
Performance Period Year	(a) Detailed Energy Survey Guaranteed Annual Cost Savings \$	(b) Total Annual Contractor Payments \$	(c) Cancellation Ceiling \$
ONE	\$ 54,405	\$ 54,405	\$ 500,245
TWO	\$ 55,632	\$ 55,632	\$ 494,968
THREE	\$ 56,887	\$ 56,887	\$ 488,206
FOUR	\$ 58,170	\$ 58,170	\$ 479,807
FIVE	\$ 59,482	\$ 59,482	\$ 469,603
SIX	\$ 60,824	\$ 60,824	\$ 457,414
SEVEN	\$ 62,195	\$ 62,195	\$ 443,041
EIGHT	\$ 63,598	\$ 63,598	\$ 426,268
NINE	\$ 65,033	\$ 65,033	\$ 406,858
TEN	\$ 66,500	\$ 66,500	\$ 384,555
ELEVEN	\$ 68,000	\$ 68,000	\$ 359,076
TWELVE	\$ 69,533	\$ 69,533	\$ 330,115
THIRTEEN	\$ 71,102	\$ 71,102	\$ 297,337
FOURTEEN	\$ 72,705	\$ 72,705	\$ 260,377
FIFTEEN	\$ 74,345	\$ 74,345	\$ 218,836
SIXTEEN	\$ 76,022	\$ 76,022	\$ 172,280
SEVENTEEN	\$ 77,737	\$ 77,737	\$ 120,235
EIGHTEEN	\$ 79,490	\$ 79,490	\$ 62,182
NINETEEN	\$ 81,283	\$ 78,959	
TOTALS	\$ 1,272,943	\$ 1,270,619	
(a) The "DES GUARANTEED ANNUAL COST SAVINGS" is based on achieving annual cost savings per site-specific M&V plan agreed to in Delivery Order. (b) This contractor payment represents the delivery order price and should be supported by information submitted in Schedules H-2 and H-3. (c) State cancellation ceilings for the end of each year (e.g. "ONE" means end of one year after Government acceptance).			

COMBINED TASK ORDERS—ALTERNATE SCENARIO

SCHEDULE H-1 -- DELIVERY ORDER
Proposed Guaranteed Performance and Annual Contractor Payments

The Contractor shall complete the following statement:

If selected the Contractor shall complete the installation of all proposed ECSMs not later than 18 months after delivery order award.

Project Site: MCAGCC Twentynine Palms	Delivery Order No.: 3 (Alternative)		Contractor Name: Johnson Controls, Government Systems LLC	
Performance Period Year	(a) Estimated Annual Cost Savings \$	(b) Proposed Guaranteed Annual Cost Savings \$	(c) Total Annual Contractor Payments \$	(d) Govt Share of Guaranteed Savings (b) - (c) \$
ONE	\$ 10,024,074	\$ 9,329,902	\$ 9,329,902	\$ -
TWO	\$ 7,027,656	\$ 6,324,891	\$ 6,324,891	\$ -
THREE	\$ 7,114,650	\$ 6,403,185	\$ 6,403,185	\$ -
FOUR	\$ 7,202,721	\$ 6,482,449	\$ 6,482,449	\$ -
FIVE	\$ 7,291,881	\$ 6,562,693	\$ 6,562,693	\$ -
SIX	\$ 7,382,146	\$ 6,643,931	\$ 6,643,931	\$ -
SEVEN	\$ 7,473,528	\$ 6,726,175	\$ 6,726,175	\$ -
EIGHT	\$ 7,566,041	\$ 6,809,437	\$ 6,809,437	\$ -
NINE	\$ 7,659,699	\$ 6,893,730	\$ 6,893,730	\$ -
TEN	\$ 7,754,517	\$ 6,979,065	\$ 6,979,065	\$ -
ELEVEN	\$ 7,850,509	\$ 7,065,458	\$ 6,362,429	\$ 703,029
TOTALS	\$ 84,347,422	\$ 76,220,916	\$ 75,517,887	\$ 703,029
(a) The technical proposal and Schedule H-4 supports this estimate of annual cost savings as "REASONABLE." (b) The "PROPOSED GUARANTEED ANNUAL COST SAVINGS" is based on achieving contractors guaranteed performance per site-specific M&V Plan agreed to in delivery order. (c) The contractor payment represent the delivery order price and should be supported by information submitted in Schedules H-2 and H-3. (d) Annual Cost Savings are escalated by 1.24% every year. (e) Construction period savings of \$363,317 applied at Acceptance to Year 1 savings. (f) Renewable energy rebate for wind energy of \$2,719,031 applied at Acceptance to Year 1 savings.				

SCHEDULE H-2 -- DELIVERY ORDER
Implementation Price by ECSM, Technology Category, and Delivery Order

Note: Use a separate page for ECSMs in the same technology category. Provide Delivery Order Total on the last page.

Project Site: MCAGCC Twentynine Palms			Delivery Order No.: 3 (Alternative)		Contractor Name: Johnson Controls, Government Systems LLC		
Tech No.	ECSM No.	ECSM Description Title	(a) Survey, Feasibility & Design Expense (\$)	(b) Construction Expense (\$)	(c)=(a)+(b) Total Implementation Expense (\$)	(d) Implementation Margin (Not to Exceed B-1) (%)	(e) = (c) x (1+d/100) Implementation Price (\$)
3	1	Waste Water Treatment Plant Pump VFD	\$ 7,400	\$ 116,013	\$ 123,413	35%	\$ 166,608
4	2	Skylights and Daylighting Control	\$ 6,200	\$ 128,473	\$ 134,673	25%	\$ 168,341
6	3	Domestic Water Solar Heating Refurbishment	\$ 2,200	\$ 46,161	\$ 48,361	30%	\$ 62,869
3	4	Energy Management Control System Upgrade	\$ 161,000	\$ 3,365,000	\$ 3,526,000	35%	\$ 4,760,100
6	5	1 MW Wind Turbine Generator System	\$ 100,000	\$ 4,083,125	\$ 4,183,125	30%	\$ 5,438,063
7	6	Air Conditioning System Upgrades	\$ 95,000	\$ 2,018,700	\$ 2,113,700	33%	\$ 2,811,221
9	2-2*	Hospital Loop Extension	\$ 50,000	\$ 2,080,000	\$ 2,130,000	33%	\$ 2,832,900
10	2-1*	Cogeneration System	\$ 966,563	\$ 11,768,491	\$ 12,735,054	28%	\$ 16,300,868
Total Implementation Price							\$ 32,540,970
		Renewable Energy Rebate (Wind) - paid to Contractor upon Acceptance.					\$ (2,719,031)
Net Price to Government After Rebate							\$ 29,821,939

*ECSMs considered in Task Order 2.

SCHEDULE H-3 -- DELIVERY ORDER
Contractor Cash Flow

Note: Add columns to Schedule H-3 so that all years in the performance period are shown.

Project Site: MCAGCC Twentynine Palms	Delivery Order No.: 3 (Alternative)		Contractor Name: Johnson Controls, Government Systems LLC									
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	
AMOUNT FINANCED												
Implementation Price (H-2, col. e, DO total) (\$)	\$ 32,540,970											
Financing Procurement Price (\$)	\$ 4,502,139											
Total Amount Financed (\$)	\$ 37,043,109											
ANNUAL CASH FLOW (PERFORMANCE PERIOD)												
Debt Service:												Totals
Interest (\$)	\$ 2,903,170	\$ 2,720,278	\$ 2,531,483	\$ 2,323,419	\$ 2,094,429	\$ 1,842,714	\$ 1,566,313	\$ 1,263,096	\$ 930,747	\$ 566,745	\$ 170,422	\$ 18,912,816
Principal Payment (\$)	\$ 4,728,414	\$ 2,081,043	\$ 2,294,992	\$ 2,527,325	\$ 2,779,646	\$ 3,053,701	\$ 3,351,393	\$ 3,674,792	\$ 4,026,155	\$ 4,407,937	\$ 4,117,711	\$ 37,043,109
(a) Total Debt Service (\$)	\$ 7,631,584	\$ 4,801,321	\$ 4,826,475	\$ 4,850,744	\$ 4,874,075	\$ 4,896,415	\$ 4,917,706	\$ 4,937,888	\$ 4,956,902	\$ 4,974,682	\$ 4,288,133	\$ 55,955,925
Penalty if debt is retired at yearend (\$)	\$ 1,615,735	\$ 1,511,683	\$ 1,396,933	\$ 1,270,567	\$ 1,131,584	\$ 978,899	\$ 811,330	\$ 627,590	\$ 426,282	\$ 205,886	\$ -	\$ 9,976,489
Performance Period Expenses:												
Management/Administration (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Operation (\$)	\$ 300,119	\$ 134,658	\$ 139,354	\$ 144,215	\$ 149,245	\$ 154,451	\$ 159,838	\$ 165,413	\$ 171,183	\$ 177,153	\$ 183,332	\$ 1,878,961
Maintenance (\$)	\$ 98,000	\$ 101,418	\$ 104,956	\$ 108,616	\$ 112,405	\$ 116,326	\$ 120,383	\$ 124,582	\$ 128,927	\$ 133,424	\$ 138,078	\$ 1,287,115
Repair and Replacement (\$)	\$ 812,800	\$ 841,150	\$ 870,489	\$ 900,851	\$ 932,273	\$ 964,790	\$ 998,442	\$ 1,033,267	\$ 1,069,307	\$ 1,106,604	\$ 1,145,202	\$ 10,675,175
Measurement and Verification (\$)	\$ 66,012	\$ 68,314	\$ 70,697	\$ 73,163	\$ 75,715	\$ 78,356	\$ 81,089	\$ 83,917	\$ 86,844	\$ 89,873	\$ 93,008	\$ 866,988
Permits and Licenses (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Insurance (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Property Taxes (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other (describe & itemize on attachment) (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
(b) Subtotal Performance Period Expenses (\$)	\$ 1,276,931	\$ 1,145,540	\$ 1,185,496	\$ 1,226,845	\$ 1,269,638	\$ 1,313,923	\$ 1,359,752	\$ 1,407,179	\$ 1,456,261	\$ 1,507,054	\$ 1,559,620	\$ 14,708,239
(c) Margin (not the exceed B-2) (%)	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	
(d) Performance Period Prices ((d)=(b) x (1+c/100))	\$ 1,698,318	\$ 1,523,570	\$ 1,576,710	\$ 1,631,705	\$ 1,688,618	\$ 1,747,516	\$ 1,808,469	\$ 1,871,549	\$ 1,936,828	\$ 2,004,383	\$ 2,074,296	\$ 19,561,962
(e) Total Annual Contractor Payment (e)=(a)+(d)	\$ 9,329,902	\$ 6,324,891	\$ 6,403,185	\$ 6,482,449	\$ 6,562,693	\$ 6,643,931	\$ 6,726,175	\$ 6,809,437	\$ 6,893,730	\$ 6,979,065	\$ 6,362,429	\$ 75,517,887

Submit the following as applicable to above debt service:
Total Annual Interest Rate: 8.67% (not to exceed B-3 plus T-Bill/T-Note reference)
T-Bill/T-Note Reference: Term 30 years; Issue Date 07/12/2001; Interest Rate 6.47%
Source: Federal Reserve Board Statistical Release H.15 (e.g. Wall Street Journal, web site)

- Notes:
- 1 Project finance rate to be fixed at time of Award
 - 2 Total Annual Contractor Payments are based upon monthly payments in arrears.
 - 3 Contract term is 149 months.
 - 4 First Year Debt service supported by \$363,317 of construction period savings and by \$2,719,031 for renewable energy rebate.
 - 5 Renewable energy rebate assumed to be paid to the Contractor upon Acceptance.

SCHEDULE H-4 -- DELIVERY ORDER**Energy and Cost Savings by ECSM, Technology Category, and Delivery Order**

Note: Use a separate page for ECSMs in the same technology category. Provide Delivery Order Total on the last page.

Project Site: MCAGCC Twentynine Palms		Delivery Order No. : 3 (Alternative)				Contractor Name : Johnson Controls, Government Systems LLC			
		(a1) Electricity (\$/kWh)	(b1) Natural Gas (\$/therm)	(c1) Other Water (\$/gallon)		(d1) Other _____ (\$/_____)			
Baseline Energy Prices (provide supporting a attachments)									
Tech No.	ECM No.	(a) Electricity Savings (kWh/yr)	(b) Natural Gas Savings (therms/yr)	(c) Other Water Savings (gallons)	(d) Other_____ Savings (_____)	(e) = (a1)(a) + (b1)(b) + etc. Estimated Total Energy Cost Savings (\$/yr)	(f) Estimated Recurring Ancillary Cost Savings* (\$/yr)	(g) = (e) + (f) Estimated Total Recurring Cost Savings (\$/yr)	(h) = H-2 col.C + (e) Simple Payback (yr)
3	1	174,058	-	-	-	\$ 17,913	\$ -	\$ 17,913	9.30
4	2	281,296	(3,619)	-	-	\$ 29,006	\$ -	\$ 29,006	5.80
6	3	-	1,970	-	-	\$ 7,486	\$ -	\$ 7,486	8.40
3	4	2,896,098	147,214	-	-	\$ 355,149	\$ -	\$ 355,149	13.40
6	5	2,386,209	-	-	-	\$ 283,553	\$ -	\$ 283,553	19.18
7	6	615,408	-	-	-	\$ 85,468	\$ -	\$ 85,468	32.89
9	2-1	-	-	-	-	\$ -	\$ -	\$ -	
10	2-2	56,401,746	(337,321)	(3,889)	-	\$ 6,143,009	\$ (3,106)	\$ 6,139,903	2.65
Delivery Order Total		62,754,815	(191,756)	(3,889)	-	\$ 6,921,584	\$ (3,106)	\$ 6,918,478	4.70
Simple Payback After Renewable Energy Rebate (Wind) - paid to Contractor upon Acceptance.									4.31

* One-time ancillary cost savings are listed in column (f) with an asterisk, and are not included in column or row totals with annually recurring energy and ancillary cost savings.

All other entries in the one-time ancillary cost row are zero.

Note: 1kWh = 3,414 Btus

Natural gas rates rates applied are as used in the DO 2 Final Proposal @ \$0.38 /therm. Currently published Southern California Edison's TOU-8 2-50kV rate tariff is applied for electricity.

Simple Payback - Sch. H-2 Installation Price divided by Total Savings

SCHEDULE H-5 DELIVERY ORDER
Guaranteed Savings, Price, and Cancellation Ceiling

The Contractor shall complete the following statement:

If selected the Contractor shall complete the installation of all proposed ECSM's not later than 18 months after delivery order award.

Project Site: MCAGCC Twentynine Palms	Delivery Order No. : 3 (Alternative)	Contractor Name: Johnson Controls, Government Systems LLC	
Performance Period Year	(a) Detailed Energy Survey Guaranteed Annual Cost Savings \$	(b) Total Annual Contractor Payments \$	(c) Cancellation Ceiling \$
ONE	\$ 9,329,902	\$ 9,329,902	\$ 33,930,431
TWO	\$ 6,324,891	\$ 6,324,891	\$ 31,745,335
THREE	\$ 6,403,185	\$ 6,403,185	\$ 29,335,593
FOUR	\$ 6,482,449	\$ 6,482,449	\$ 26,681,902
FIVE	\$ 6,562,693	\$ 6,562,693	\$ 23,763,274
SIX	\$ 6,643,931	\$ 6,643,931	\$ 20,556,888
SEVEN	\$ 6,726,175	\$ 6,726,175	\$ 17,037,926
EIGHT	\$ 6,809,437	\$ 6,809,437	\$ 13,179,394
NINE	\$ 6,893,730	\$ 6,893,730	\$ 8,951,931
TEN	\$ 6,979,065	\$ 6,979,065	\$ 4,323,597
ELEVEN	\$ 7,065,458	\$ 6,362,429	\$ -
TOTALS	\$ 76,220,916	\$ 75,517,887	
<p>(a) The "DES GUARANTEED ANNUAL COST SAVINGS" is based on achieving annual cost savings per site-specific M&V plan agreed to in Delivery Order.</p> <p>(b) This contractor payment represents the delivery order price and should be supported by information submitted in Schedules H-2 and H-3.</p> <p>(c) State cancellation ceilings for the end of each year (e.g. "ONE" means end of one year after Government acceptance).</p>			

**Investment Grade Audit
Twentynine Palms**

EXECUTIVE SUMMARY

Pursuant to Contract DACA87-97-0069 and the task order requirements issued by the Department of Navy (DON) ESPC Team, Johnson Controls is pleased to provide this Energy Cost Savings Measure (ECSM) Proposal for the Marine Air/Ground Task Force Training Center (MAGTFTC) Twentynine Palms, California. This project will implement the ECSMs identified in the Project 3 Site Survey Report submitted July 24, 2001.

This project is a modification to the existing Cogeneration Plant ESPC Project 2 and incorporates the energy cost savings produced to support the cashflow required to fund the combined projects. The ECSMs included in the Feasibility Study are as follows:

ECSM 1: Air Conditioning System Upgrades

ECSM 2: Energy Management Control System Upgrade

ECSM 3: 1.1 MW AC Photovoltaic System

ECSM 4: Skylights and Daylighting Control

The proposed calculated annual savings for these ECSMs are \$6,966,784. The project cost is \$67,166,280 and provides a project with a simple payback of 8.07 years. The Price Proposal includes H-Schedules that reflect an 18-year term that meets current contract requirements.

The annual cost savings represent the net effect of reduced electrical purchases, increased natural gas purchases, and maintenance, operation, repair, and replacement costs for the installed ECSMs.

OVERVIEW

MAGTFTC Twentynine Palms identified the need for a reliable, efficient, stand-alone source for electricity and High Temperature Hot Water (HTHW) to serve base loads due to several problems encountered with their current electricity supply source.

As a result, a 7-MW natural gas-fired turbine, simple-cycle cogeneration system is currently under construction at MAGTFTC Twentynine Palms. The ECSMs proposed in Project 3 build upon the strategic direction identified by MAGTFTC Twentynine Palms FMD during the development of the cogeneration system. This strategic approach provides for current and future physical plant requirements to operate and maintain the facility infrastructure and ensure a least-cost, energy-efficient operation.

SIGNIFICANT CHANGES FROM SITE SURVEY REPORT (SSR)

During project development and the Feasibility Study, the scope has been modified to significantly impact the price of the project. These significant scope changes include:

- Addition of three Central Chiller Plants and associated infrastructure to support Chilled Water (CHW) supply to connected buildings in the 1400/1600/1800 blocks areas.

- Addition of concrete utility corridor for chilled water main distribution piping sized for future relocation of HTHW loops.
- Addition of higher level control operations managed through the EMCS. The SSR typically identified simple start/stop control strategies. This ECSM Proposal incorporates several control strategies, including CO₂ monitoring in the Bachelor Enlisted Quarters (BEQs) to control outside air intake, temperature reset, and additional control points as requested by FMD.
- Use of absorption chillers in the chiller plants to utilize waste heat generated by the Cogen Plant.
- Additional valves and equipment requirements associated with repairing the HTHW valves to ensure proper operation of the HTHW system.
- Increased participation by Johnson Controls in tasks related to operations and maintenance (O&M) of the additional scope included in the ECSMs.
- Additional skylights and equipment identified to support the daylighting ECSM.
- Addition of 100 kW photovoltaic panels, increasing size to 1.1 MW.

BASELINE DATA AND M&V PLAN

The baseline and site-specific M&V Plan for the proposed ECSMs has been developed to address the specific requirements requested by MAGTFTC Twentynine Palms and NFESC.

SITE MANAGEMENT PLAN

Our comprehensive Site Management Plan defines the management approach that will be used to implement all project deliverables under this award. The plan addresses project schedule, project organization, cost control, project control, subcontract plan, maintenance and repairs, and specific training provided to base personnel.

SUMMARY

Johnson Controls is pleased to provide this ECSM Proposal for MAGTFTC Twentynine Palms and stands ready to deliver a high quality result for the base. The Johnson Controls team would like to extend its gratitude to the teams at MAGTFTC Twentynine Palms, NAVFACCO, NFESC, and SWDIV for their support, involvement, and direction on this project.

ECSM 1: AIR CONDITIONING SYSTEM UPGRADES

EXECUTIVE SUMMARY

This ECSM will construct three new central plants strategically located to serve the buildings in the 1400, 1600 and 1800 block at MAGTFTC Twentynine Palms. The new plants will replace the existing chillers, evaporative cooling and packaged A/C units with chilled water cooling systems served by central distribution systems. The new plants will have a total of 3,000 tons of initial cooling capacity and will be expandable to 5,700 tons. The efficient central plant design incorporates primary/secondary chilled water pumping systems with high temperature differential and reduced pumping requirements. This allows smaller distribution piping requirements, which reduces installation costs.

The preliminary design for the new central plant equipment includes:

- 6 chillers
- 3 cooling towers
- 31 centrifugal pump assemblies
- 3 expansion tanks
- 3 air separators

The air conditioning systems in 28 mechanical-cooled buildings will also be upgraded and the preliminary design includes the following equipment:

- 70 air handling units (AHUs)
- 49 cooling coils
- 17 variable speed drives (VSDs)
- Required insulated piping for connection of central plants to upgraded building cooling systems

The specific equipment and quantities will be determined during final design after Task Order award.

Implementation of this ECSM will provide the following benefits:

- Centralization of chilled water production at efficient central plants
- Enhanced and more efficient cooling from upgraded AHUs and cooling coils and converting 3-way to 2-way valves for use with the VSD secondary chilled water loops
- Conversion of space cooling from direct-expansion to the more efficient chilled water method
- Provision for future expansion of central plants and serving additional buildings

- Infrastructure for expansion of existing evaporative-cooled buildings at low incremental costs
- Improved working environment for existing mechanical-cooled buildings
- Flexibility in choice of cooling source energy usage by matching one absorber with one electric chiller
- Reduced maintenance requirements by converting direct-expansion cooled buildings to chilled water
- Reduced cooling costs through using optimized chiller technology and selecting either absorption or electrical vapor compression chillers

The description of this ECSM including the accompanying drawings and calculations are intended to comprise the basis of design for furnishing all labor, materials, equipment and supplies required for the satisfactory completion of all associated work. Location of existing piping, equipment and site conditions shown on the plans and described in the basis of design are based on the best-known information available at this time. Included are assumptions and exclusions regarding buildings included, the scope of work at each building, design conditions, materials and equipment selections.

1. DETAILED DESCRIPTION OF ECSM

The existing buildings affected by this ECSM fall into the following four categories:

1. Bachelor Enlisted Quarters (BEQs) with packaged air conditioning units
2. BEQs with small chilled water plants
3. Administration or classroom buildings with small chilled water plants
4. Classroom, training or other buildings with direct expansion (DX) cooling units

The new central plants are designated by the building block numbers they will serve. The new 1400, 1600 and 1800 Central Plants will be constructed at strategic locations identified on the drawings and will provide chilled water for space conditioning to buildings and structures.

Technologies for the new liquid chillers include absorption and vapor compression, to allow for alternative fuel sources for producing chilled water. Except for minor electrical requirements for solution, chilled water and condenser water pumping, the absorption chillers will be powered by the existing High-Temperature Hot Water (HTHW) systems currently in place. While the vapor compression chillers will be powered exclusively by electrical power, Heating Ventilating and Air Conditioning (HVAC) systems in specified buildings will be modified to allow for chilled water cooling, to take advantage of cooling provided by the new and efficient chilled water central plants. The chilled water plants and distribution systems are designed for high temperature water differential, improving operating efficiency and reducing the required distribution infrastructure. Space conditioning provided by the central plants will be more efficient to operate than with individual package-type units. The new chiller plants will also be integrated into the facility's expanded Energy Management Control System (EMCS), providing centralized control of all

chiller plants and enabling advanced chiller control. Johnson Controls will continue to assist MAGTFTC Twentynine Palms in determining the optimum chiller sequencing.

For the buildings included, this ECSM will install chilled water coils in existing AHUs, replace selected existing AHUs with new chilled water AHUs, and connect existing or new chilled water systems to the new central plants. For each existing cooling system the following upgrades will be implemented:

1. **Buildings that have existing chilled water systems:** The new central plants will be connected to the existing chilled water systems and provide the same capacity as originally designed except as noted for Building 1738, for which additional capacity is being supplied.
2. **Buildings that have existing air-cooled packaged units:** Chilled water coil will be added to the existing AHUs, or new chilled water air units will be installed. The new chilled water coils or systems will have the same capacity as originally designed.
3. **Buildings that have existing evaporative cooling:** Chilled water coils will be added to the existing AHUs, or new chilled water air units will be installed if the existing unit is in poor condition. The new chilled water coil or system will be sized based upon load calculations for each building. In addition insulation will be installed on existing supply ductwork where required.

Building number, description, existing cooling system type, cooling load and proposed central plant attachment are summarized in Table 1. Buildings listed are those selected by MAGTFTC Twentynine Palms as high priority for inclusion in this ECSM.

Table 1: Building Description Summaries

Building No.	Building Description	Existing System (CHW, DX, EVAP)	Existing Tons	New Tons	Removed Elec. Load (KVA)	Chiller Plant	Corresponding Drawings
1360	BEQ (NEW CONSTRUCTION - 2000)	CHW	74	74	119	1400 PLANT	
1403	BEQ E1-E4	DX	125	125	180	1400 PLANT	M3.0, M3.1
1412	BEQ E1-E4	CHW	125	125	150	1400 PLANT	
1423	BEQ E1-E4	CHW	125	125	150	1400 PLANT	
1443	BEQ E1-E4	DX	125	125	180	1400 PLANT	M3.0, M3.1
1541	CHAPEL	DX	75	75	79	1400 PLANT	M3.4
1551	CHILD CARE CENTER	CHW	150	150	108	1400 PLANT	
CENTRAL PLANT	1400 AREA CENTRAL PLANT	N/A	N/A	1200	N/A	1400 PLANT	M0.1, M2.0, M4.0

Table 1: Building Description Summaries (continued)

Building No.	Building Description	Existing System (CHW, DX, EVAP)	Existing Tons	New Tons	Removed Elec. Load (KVA)	Chiller Plant	Corresponding Drawings
1542	CHAPEL	DX	75	75	79	1600 PLANT	M3.5
1547	SERVED BY 1549	CHW	0	0	0	1600 PLANT	
1548	SERVED BY 1549	CHW	0	0	0	1600 PLANT	
1549	MISC UTILITY PLT BUILDING	CHW	75	75	49	1600 PLANT	
1552	MEDICAL CLINIC	EVAP Precooler and DX	30	30	0	1600 PLANT	
1591	DENTAL CLINIC	DX	100	100	100	1600 PLANT	M3.2
1607	BEQ E1-E4	DX	125	125	130	1600 PLANT	M3.0
1616	BEQ E1-E4	DX	125	125	130	1600 PLANT	M3.0
1627	BEQ E1-E4	DX	125	125	130	1600 PLANT	M3.0
1636	BEQ E1-E4	DX	125	125	130	1600 PLANT	M3.0
1645	BEQ E1-E4	DX	125	125	130	1600 PLANT	M3.0
CENTRAL PLANT	1600 AREA CENTRAL PLANT	N/A	N/A	1200	N/A	1600 PLANT	M0.1, M2.0
1825	APPLIED INSTRUCTIONS	DX	43	43	45	1800 PLANT	M3.1
1826	APPLIED INSTRUCTIONS	DX	35	40	50	1800 PLANT	M3.2
1828	APPLIED INSTRUCTIONS	DX	35	25	35	1800 PLANT	M3.2
1830	WAREHOUSE	EVAP	-	10	0	1800 PLANT	M3.3
1831	ELEC COMM MAINTENANCE SHOP	EVAP	7	40	0	1800 PLANT	M3.4
1833	APPLIED INSTRUCTIONS	DX	35	28	35	1800 PLANT	M3.2
1839	APPLIED INSTRUCTIONS	DX	35	28	35	1800 PLANT	M3.2
1843	APPLIED INSTRUCTIONS	DX	35	28	50	1800 PLANT	M3.2
1847	APPLIED INSTRUCTIONS	DX	40	40	-	1800 PLANT	M3.2

Table 1: Building Description Summaries (continued)

Building No.	Building Description	Existing System (CHW, DX, EVAP)	Existing Tons	New Tons	Removed Elec. Load (KVA)	Chiller Plant	Corresponding Drawings
1848	AUTO ORGANIZATIONAL SHOP	CHW	110	110	190	1800 PLANT	M3.5
1859	APPLIED INSTRUCTIONS	CHW	150	150	241	1800 PLANT	M3.6
1865	ADMIN	DX	50	50	40	1800 PLANT	M3.7
CENTRAL PLANT	1800 AREA CENTRAL PLANT	N/A	N/A	600	N/A	1800 PLANT	M0.1, M2.0

The proposed new chilled water plants will consist of absorption chillers, powered by HTHW, and vapor compression centrifugal chillers, powered exclusively by electricity. The plants will be configured for future expansion, by allowing space for at least one additional centrifugal chiller and its required pumps and ancillary equipment. Sizing for pumps, cooling towers, ancillary equipment, and configuration of the systems, including distribution pumping and piping, will be finalized during the detailed design after Task Order Award.

Chilled water generated at the new Central Plants will be distributed to the various buildings throughout the blocks as depicted on drawings included in ECSM 1 Appendix, Section 1. Main distribution piping will be installed in utility trenching and branch piping will be direct buried underground. Utility trenching will be installed at grade level with removable concrete lids to serve as sidewalks for pedestrian areas. At traffic locations, an asphalt covering will be installed on top of trenching lids. Generally, 12" of separation with existing utilities will be maintained. However, exceptions will be made by Johnson Controls as conditions warrant.

Direct buried piping material will be class 160 PVC Carrier pipe, polyurethane foam insulation and a PVC jacket cover. Piping will be buried to provide a minimum of 24" cover. Valves for present and future buildings will be installed within concrete valve vaults to facilitate access. Installation of the underground piping will include barricading, traffic control and trench plating as necessary to allow the base operations to continue during implementation. Branch piping to and through the buildings will be routed above grade following the existing high temperature piping or on its own below eaves and on roofs. Piping on roofs will be mounted on 4" redwood sleepers with unistrut. Material for piping above grade and in utility trenches will be steel or copper Carrier pipe with polyurethane or equal insulation and a galvanized steel jacket.

Main electrical service will be 12.47kV from the existing site loop service. A new 12.47kV liquid-filled transformer will be installed at the exterior of each of the proposed new central plant buildings. The proposed chiller plant layout and pipe routing, as well as a description of the proposed work at each building, is presented in ECSM 1 Appendix, Section 1.

Implementation of this ECSM will affect numerous buildings throughout the base; the buildings have been separated by chiller plant and are summarized below:

1400 Chilled Water Plant (1400 & 1500 Buildings)

After evaluation of the surrounding areas to the 1400 area, the parking lot near BEQ 1462 was determined to be the best location for the new chilled water plant. See ECSM 1 Appendix Section 1 for site location. The project team selected this location because the space is not on a future development plan, it is in close proximity to HTHW piping for future absorption chiller considerations, and it is assumed to have adequate electrical capacity. Prior to proceeding with the design development the selected site was reviewed with base personnel and its selection approved.

Buildings 1413 and 1424 are existing chiller plants that will remain as back-up for the new chiller plant. The chilled water plant will be sized to meet current cooling requirements of the buildings listed above as well as future considerations for MILCON projects. The size of this plant is currently estimated at a total build-out of 2,400 tons. Build-out capacity for each central plant refers to the overall plan to accommodate future construction.

1600 Chilled Water Plant (1600 and 1500 Buildings)

The next chiller plant addition is proposed for the 1600 block of buildings. After careful evaluation of the surrounding areas, the empty lot near the dental facility was determined to be the best location for the new chilled water plant. See ECSM 1 Appendix Section 1 for site location. The site was selected since the space was not on a future development plan, the proximity to the HTHW, and is assumed to have adequate electrical capacity. Prior to proceeding with the design development, the selected general site area was reviewed with base personnel and its selection approved.

This chilled water plant will be sized to meet current cooling requirements of the buildings listed above as well as future considerations for MILCON projects. The size of this plant is currently estimated at a total build-out of 2,400 tons.

1800 Chilled Water Plant (Block 1800 Buildings)

The 1800 area is located at the northern end of the base. Currently there is an existing chilled water plant in Building 1748, serving Buildings 1737, 1738, 1747, 1748, 1757, and 1758. The basis of design is to build a new chilled water plant near Building 1848 to serve the air-conditioning loads of buildings north of Ninth Street. Prior to proceeding with the design development the selected site was reviewed with base personnel and its selection approved. The existing absorption chiller in Building 1748 will remain in place and will be re-piped to allow for the “pre-cooling” of the CHWR loop from the 1800 area. Thus, this chiller can be utilized.

This chilled water plant will be sized to meet the current cooling requirements of the buildings listed above as well as future considerations for MILCON projects. The size of this plant is currently estimated at a total build-out of 900 tons.

Buildings 1584 and 1587

As part of this ECSM, the chilled water lines in Buildings 1584 and 1587 will be connected to an existing chiller installed as part of ESPC Project 1. In Building 1584, only the older part of the

building with an existing chiller will be connected to the Project 1 chiller. The split systems in the newer part of Building 1584 are excluded from this measure.

1.1 Assumptions

The following assumptions have been made:

1. All engineering calculations for design purposes will be based on the latest recommendations of ASHRAE. The design will conform to the requirements of the Uniform Building Code (UBC), Uniform Mechanical Code (UMC), Fire Marshal, and all applicable federal and local codes or requirements.
2. The new central plants will be constructed in locations previously discussed with FMD personnel. The locations have been discussed with base personnel and have been agreed upon by various departments. Specific locations will be defined in final design. Building exteriors will match surrounding buildings to the fullest extent practical.
3. Sufficient water, sewer, telephone, network and electrical services are within 100 feet of the proposed construction sites.
4. New chiller plant buildings will be slab-on-grade with over-excavation and re-compaction of existing fill. Each building will consist of approximately 3,600 square feet of floor space, with an additional 1,800 square feet of exterior yard. Refer to ECSM 1 Appendix, Section 1 for detailed building dimensions.
5. Building construction will consist of split faced, 8-inch concrete masonry unit (CMU) block with a smooth interior. If feasible, use of "Rastra" building material will be considered.
6. Roof drains will be designed and installed during the construction stage. The roof drains will be designed to provide adequate drainage and will be connected to the existing site storm water system through below grade connections or via the surface.
7. Piping will be permitted on existing roofs. Pipe supports on roofs will be surface mounted and will not penetrate existing waterproof membranes.
8. All existing mechanical equipment not designated to be salvaged will be demolished and removed. Existing site concrete pads and exterior louvers are to remain. All piping connections will be made within the existing central plants.
9. The existing 12.47kV system can support the new central plant load.
10. Short circuit issues on site are not addressed.
11. Emergency power will not be required.
12. SF6 (sulfur hexafluoride) 3-way switch is acceptable.
13. Salvage material to be collected and stored at a government designated storage area.
14. Final disposition of salvage material to be determined by government during site construction kick-off meeting.

15. Training will be provided as specified in the Management Approach section.

1.2 Inclusions

The following is included in the scope of work for this ECSM:

1. All materials including chillers, cooling towers, chilled water and condenser water pumps, pump motor controllers, chilled water and condenser water piping, and electrical wiring.
2. Mechanical and electrical labor
3. Power supply to chillers, cooling towers, chilled water and condenser water pumps and starters
4. Engineering, design, project management, programming and commissioning
5. As-built drawings of the installed HVAC upgrades
6. Testing and balancing of chilled water and hot water piping systems affected by this ECSM
7. Demolition and removal of existing mechanical equipment not designated to be salvaged (existing site concrete pads, and exterior louvers to remain)
8. Water chillers, pumps, and other equipment will be installed on concrete bases and then anchored to structures.

1.3 Exclusions

The following is excluded from the scope of work for this ECSM:

1. All sites of construction are presumed to be free of hazardous materials. Johnson Controls will not be responsible for testing of hazardous material nor for containment, remediation, or disposal of hazardous material. If any hazardous substances are encountered by Johnson Controls, or its subcontractors, during the course of the implementation of this project, Johnson Controls will stop work and notify the Contracting Officer and activity personnel. Remediation and disposal of hazardous substances, and costs associated with construction delays will be the responsibility of MAGTFTC Twentynine Palms.
2. Johnson Controls is not responsible for maintaining constant cooling or ventilation in all areas at all times. Some loss of cooling and airflow will be necessary during construction. Temporary cooling units, chillers, fans, air-handlers, and similar measures are not included. Shut downs will be on weekends and off-hours whenever possible. If critical areas must be shut down, MAGTFTC Twentynine Palms will be notified 30 days in advance and work will be scheduled accordingly. The maximum period for building shutdowns will be five days. All shutdowns will be coordinated through FMD.
3. The project team will not be responsible for strict adherence to the requirements contained within the A&E Guide. Design drawings and specifications will provide sufficient detail to adequately indicate construction requirements of this design build project. The drawings will clearly identify code compliance and level of detail necessary to successfully complete construction and perform routine maintenance.

4. The following are exceptions to the A&E design guide:

- Design will be in inch-pound units i.e. inches, feet, etc. All metric requirements are waived.
- Submittals are limited to 100% and final.
- The ECSM Proposal will constitute the Basis of Design report. An additional report as outlined in Chapter 6 is not required.
- The yellow-red-yellow-blue back check procedures and documentation as outlined in section 7.1.1 will not be required. In-house Quality Control procedures will be used in lieu of this outline.
- NPDES permitting for storm water as outlined in Section 7.2.2.1 is not required.
- American Institute of Architects (AIA) Masterspec can be substituted for Naval Facilities Guide Specifications (NFGS) INTACT/SGML format.
- Cost estimates as required in Chapter 9 and MIL-HDBK-1010 are not required.
- Formal bound volumes of discipline "calculations" as outlined in Attachment A are not required.
- The A&E will not be required to provide electronic copies of documents used in the design process, i.e. hand calculations, sketches, correspondence etc.
- An environmental permit as outlined in Attachment D is not required.
- The O&M manual will not be required to be scanned in to electronic format.
- Section/detail identification requirements will be limited to main drawings, sections, and partial plan call-outs.
- Additional engineering studies as outlined in Section 3.1.1 are not required.
- The formal Architectural Review Board requirements under Section 3.8 are not required.
- Color Renderings are not required.
- A formal Energy Conservation Report as outlined in Section 3.11 is not required.
- Short circuit and coordination studies as outlined in Section 3.22 are not required.
- Designer to ROICC Report and Presentation is not required.

5. All chemicals beyond initial fill, to be provided under Operations and Maintenance service or the Repair and Replacement agreement as indicated in the Management Approach section.

2. LOCATIONS AFFECTED

Implementation of this ECSM will affect numerous buildings throughout the base. The affected buildings by chiller plant are:

1400 Chilled Water Plant (1400 and 1500 Buildings)

The parking lot near BEQ 1462 will be the location for the new chilled water plant.

The chilled water plant will be connected to Buildings 1360, 1443, 1423, 1412, and 1403 in the 1400 block, and to Buildings 1541 and 1551 in the 1500 block. Piping will exit the central plant and extend west across Griffin Road, at which point it will turn north. A branch pipe will extend south crossing 3rd street and extend to Building 1360. Main pipes will extend north crossing 4th Street, and turn west, ending at the branch line connecting Building 1541. Just south of building 1456 main pipes will turn west running full length to Building 1403. Main distribution piping will be installed in utility trenching. Branch pipes will be installed to Buildings 1403, 1413, 1424, and 1443.

1600 Chilled Water Plant (1600 & 1500 Buildings)

The empty lot near the dental facility will be the location for the new chilled water plant.

The plant will be connected to existing BEQs, 1645, 1636, 1627, 1616 and 1607, future BEQs between Buildings 1607 and 1616, Dental Building, 1591, and Buildings 1552, 1549, and 1542. Piping will exit the central plant and extend west across Griffin Road. Main distribution piping will be installed in utility trenching. A branch pipe will extend south east to Building 1591. Piping will also turn north and extend to just south of, but not connect to Building 1654, and then turn west and extend across Brown Road. It will then run north, turning west just south of Building 1616 and extending to the southwest corner of Building 1607. Branch pipes will extend to Buildings 1607, 1616, 1627, 1636, and 1645. In addition, branch pipes will extend to the northwest corner of Building 1542 and to Building 1549. All other branch piping will be valved at the mains for future extensions.

1800 Chilled Water Plant (1800 Buildings)

The new chilled water plant will be near Building 1848 and serve the buildings currently connected to the existing chilled water plant in building 1748 which includes Buildings 1737, 1738, 1747, 1748, 1757, and 1758.

The plant will be connected to existing Buildings 1865, 1859, 1848, 1847, 1843, 1839, 1831, 1833, 1830, 1825, 1828, and 1826. Piping will exit the south side of the central plant, where it will divide into two branches. The eastern branch will turn south and extend to cross-connect with the existing central plant at Building 1748. It will also turn east and extend across Griffin Road to the southwest corner of building 1865. The western branch will extend west to a point between Buildings 1826 and 1828. A branch will be installed from the main to head south to within 100' of Building 1833.

Buildings 1584 and 1587

Buildings 1584 and 1587 will be connected to an existing chiller installed as part of ESPC Project 1.

3. INTERFACE WITH GOVERNMENT EQUIPMENT

Interface with government equipment will occur in three main areas:

1. **Buildings that have existing chilled water systems:** Interface with government equipment at these buildings will consist of connecting to the existing chilled water systems at the suction side of pumps with the same capacity as originally designed.
2. **Buildings that have existing air-cooled packaged units:** Interface with government equipment at these buildings will consist of connecting to existing ductwork with a new chilled water air handling unit. New chilled water coils or systems will have the same capacities as were originally designed in the package DX systems.
3. **Buildings that have existing evaporative cooling:** Interface with government equipment at these buildings will consist of adding chilled water coils into existing AHUs. New chilled water coils or systems will be sized based on load calculations for each building. In addition, these buildings will include installation of insulation on the existing ductwork where required.

For additional detail pertaining to government equipment interface, unit replacement and demolition work, see ECSM 1 Appendix Section 1.

4. PROPOSED EQUIPMENT IDENTIFICATION

New chilled water plants will consist of centrifugal and absorption chillers, related chilled water and condenser water pumps, cooling towers, and ancillary equipment. Preliminary design documents including quantity, configuration, performance characteristics, size, capacity, cut sheets, drawings and other data are provided in the ECSM Appendix Sections 1 and 2. The following is a summary of equipment at the proposed central plants based on the preliminary design. Specific equipment and quantities will be determined during final design after Task Order award.

1. 1400 Area Central Plant:
 - One 600-ton centrifugal chiller
 - One 600-ton absorption chiller
 - One 3-cell cooling tower with motors
 - 11 centrifugal pump assemblies with motors and piping
 - One expansion tank
 - One air separator
 - Two AHUs
 - 11 cooling coils
 - Six VSDs
2. 1600 Area Central Plant

- One 600-ton centrifugal chiller
 - One 600-ton absorption chiller
 - One 3-cell cooling tower with motors
 - 11 centrifugal pump assemblies with motors and piping
 - One expansion tank
 - One air separator
 - 40 AHUs
 - 32 cooling coils
 - Six VSDs
3. 1800 Area Central Plant:
- Two 300-ton centrifugal chillers
 - One 2-cell cooling tower with motors
 - Nine centrifugal pump assemblies with motors and piping
 - One expansion tank
 - One air separator
 - Nine AHUs
 - Six cooling coils
 - Five VSDs
4. Chillers will be vapor compression centrifugal or absorption, with nominal design capacities as shown in the ECSM 1 Appendix. Centrifugal chillers will use R-123 refrigerant, have minimum full-load efficiency levels of 0.55 kW/ton or better, and have microprocessor control panels capable of communicating with Johnson Controls Metasys energy management systems.
5. Cooling towers will be sized for existing loads, while allowing for future build-out. They will be capable of being individually controlled, be equipped with VSDs and be constructed with stainless steel pans and fiberglass reinforced plastic (FRP) panels.
6. Chilled water pumping will be configured as primary/secondary with VSDs on secondary pumps. Pumps will be sized for specific chiller flow requirements and will be configured to allow any pump to serve any chiller. Pumps will be base mounted end suction type with NEMA-rated premium efficiency motors.
7. Piping over 2" within the plant will be schedule-40 steel with welded fittings.
8. Chiller plants will be equipped with a refrigerant exhaust system per UMC Chapter 11.

9. Chiller plants will have connection valves for installation of future temporary chilled water services.
10. Cooling towers will have filtration in addition to chemical treatment for both closed (chilled water) and open (cooling tower) systems.
11. HVAC fan coils for office areas and electrical equipment rooms.
12. Exhaust fans for toilet rooms, electrical rooms and chiller room.
13. Central plant controls, including microprocessor control of chillers, cooling towers, VSDs, pumps, fan coils and exhaust fans. System will include front end in operator's office area.

5. PHYSICAL CHANGES TO EXISTING SITE

Physical changes to the existing site will include the addition of three new buildings, as well as minor site improvements surrounding chiller plants, including affected parking areas and side-walks. Chilled water distribution piping will have exposed piping on roofs. Utility trenching will be installed for main distribution HTHW piping.

See ECSM 1 Appendix Section 1 for drawings.

6. ENERGY SAVINGS PROPOSED

Proposed energy and cost savings are presented in Tables 2 and 3.

Table 2: Proposed Annual Energy Savings

	Electricity			Other Utilities	
	Consumption (kWh)	Annual Peak Demand (kW)	Total On-Peak Demand (kW)	High Temperature Hot Water (therms)	Annual Energy (decatherm/MMBtu)
Baseline	9,754,472	2,547	21,368	0	33,284
Post-Installation	7,000,713	1,363	14,394	95,563	33,486
Total Savings	2,747,319	1,184	6,974	-95,563	-182

Table 3: Proposed Annual Cost Savings

	Electricity	High Temperature Hot Water	Total
Baseline	\$1,494,665	\$0	\$1,494,665
Post Installation	\$1,030,546	\$30,622	\$1,061,168
Total Savings	\$464,119	-\$30,622	\$433,497

6.1 Detailed Energy Analysis

Baseline and post-installation energy analysis methods and conditions are explained here for the proposed 1600 central plant. Central plants for 1400 and 1800 series buildings were developed similarly.

Buildings served by the 1600 central plant include the following: BEQs 1607, 1616, 1627, 1636 and 1645, Chapel 1542, Medical Clinic 1552, and Dental Clinic 1591. Buildings used as models were 1664 for BEQs, 1518 for the Chapel, 1826 for the Medical Clinic, and 1559 for the Dental Clinic. Building 1549 was modeled to represent a small miscellaneous utility plant structure. Justification for selection of appropriate models is provided in the Baseline Discussion included in the Energy Baseline and ECSM Performance Measurement Appendix. Refer to ECSM 1 Appendix 1 Sections 3 and 4 for additional detail concerning model designations and calibration curves for the buildings of the three central plants.

Energy savings were estimated using the Market Manager building energy simulation program. Selected buildings were audited and modeled, with baselines calibrated to match actual metered electrical energy use. The simulations are post-EMCS installation, to allow inclusion of interactive energy savings. Information pertaining to model calibration is presented in ECSM 1 Appendix Section 4.

Two scenarios were modeled. The baseline case consisted of buildings as they currently are conditioned. The second scenario, or post-installation case, represented the same buildings as they will be conditioned using cooling water from the central plant. Modeled buildings, similar in size and function to the buildings proposed to be connected to the new chilled water loops, were combined and connected to a central plant within the Market Manager simulation. The central plant model was given performance characteristics to match proposed equipment efficiency levels and operating characteristics. Efficiency improvement strategies, such as chilled water reset, were applied to the second scenario. The difference between energy use in the baseline model that for the post-installation model represents the estimated energy savings. ECSM Appendix 1 section 5 provides Market Manager outputs including energy use, energy cost and summary information.

An overview of the Market Manager program, and a discussion of the simulation and calibration procedures is also found in the Baseline Discussion included in the Energy Baseline and ECSM Performance Measurement Appendix.

6.2 Baseline Assumptions

A sample list of Market Manager inputs and assumptions for Building 1559 are provided in ECSM 4: Energy Management Control System (EMCS), Section 7.2. This description lists and explains assumptions which were made to establish the baseline operating conditions for that building. Assumptions for the establishment of baselines for all buildings can be found in ECSM 2 Appendix Section 5.

Most 1600 buildings for the baseline case are cooled using direct expansion or evaporative cooling methods. Direct expansion cooling units are assumed to have coefficients of performance (COPs) of 2.93 (1.20 kW/ton). Building 1559 is modeled with a central plant, using the following characteristics:

- Cooling source is a water-cooled reciprocating chiller. Part load curves are default Market Manager curves for a small reciprocating chiller. Peak COP is assumed to be 3.9 (0.9 kW/ton).
- Chilled water and condenser water pumps draw a total of 3.8 kW based on an assumed 70% load of nameplate hp). Cooling tower is auto-sized by Market Manager.
- Heating is provided by the central plant, and is defined as a boiler auto-sized by Market Manager. Incremental boiler efficiency is set at 78.5%, with 0% standby loss. The part load curve is set to unity, i.e. constant efficiency.
- Chilled water supply temperature is 44° F.
- Market Manager bin weather temperature data was created from a 20-year average to a typical meteorological year (TMY) data file for Twentynine Palms.

As shown in ECSM 1 Appendix Section 3, the model for Building 1559 is used to represent Building 1551. Similarly, other modeled buildings are used to represent actual buildings of the 1400, 1600 and 1800 central plants.

6.3 Post-Installation Assumptions

The following assumptions were made to establish the post-installation 1600 central plant operating conditions:

- Cooling source is a combination of water-cooled centrifugal and absorption chillers. Part load curves are generated from manufacturers unloading data. Peak COP for centrifugal chillers, as provided by manufacturer's data, is 6.6 (0.529 kW/ton) and for absorption chillers, 1.25 COP. For the 1800 central plant, centrifugal efficiency is 0.541 kW/ton, or 6.5 COP. Curve fits for part-load chiller efficiency are provided in ECSM 1 Appendix Section 6.
- Centrifugal chillers are equipped with VSDs on the compressor motors (prime movers).
- Base load cooling is by absorption chillers for central plants 1400 and 1600, using no-cost waste heat provided by the co-generation facility.
- Base load cooling for plant 1800 is by the existing absorption chiller using HTHW from the central plant.
- Cost of HTHW calculated with \$0.38/therm of natural gas cost with a 78.5% overall heating system efficiency
- Primary chilled water, condenser water and HTHW pumps draw a total of 78.1 kW (assumed 70% load of nameplate hp) when one centrifugal and one absorption chiller are operating. Secondary chilled water pumps, with VSDs, draw 82.6 kW at full speed. Cooling tower power draw is 75.0 kW.
- Hydronic heating is provided by the central plant, and is defined as a boiler auto-sized by Market Manager. Boiler plant overall efficiency is set at the stipulated 78.5%, with 0% standby loss. The part load curve is set to unity, i.e., constant efficiency.

- Existing buildings with gas furnace heating will continue to use this method for heating and will not be connected to the central boiler system.
- Heating is locked out above outdoor temperature of 70° F. Cooling is locked out below outdoor temperature of 45° F.
- Chilled water supply temperature is 43° F, returning to the chillers at 57° F.
- Chilled water distribution piping losses are calculated by Market Manager, presuming an average pipe diameter of 6.0", and an average R-value of 10.0 ft²° F/Btu/hr. Total chilled water pipe lengths vary according to preliminary central plant drawings.
- Market Manager bin weather temperature data was created from a 20-year average TMY file for Twentynine Palms.

6.4 Data

This ECSM uses the following supporting data:

- Manufacturer supplied full- and part-load data for electrical and absorption chillers
- Measured supply fan motor loads
- Supply fan run-time logs
- Space temperature logs
- Chiller, boiler, packaged unit, fan, and pump motor nameplate data
- Mechanical equipment schedules with heating/cooling capacities, power inputs, fan CFMs, and static pressure values
- Lighting fixture quantities from electrical drawings and actual fixture quantity counts, where applicable
- Building electrical power metering for baseline model tuning

The following design parameters and inclusions are the basis of design for the calculations presented in this document:

Design Temperature and Humidity Conditions:

Outside Design Conditions Summer 110° F Dry Bulb / 72 °F Wet Bulb

ASHRAE 2.5% data

Winter 30° F Dry Bulb

Inside Design Conditions Summer 78° F Dry Bulb (humidity will not be controlled)

Winter 68° F Dry Bulb

Design Lighting and Equipment Heat Gain:

Lights	1.6 Watts/ ft ² (ASHRAE 90.1)
Miscellaneous equipment	0.5 Watts/ ft ²

Design Occupancy Heat Gain -sensible and latent heat (SH and LH):

People Density (Per ASHRAE Data)

Offices:	150 ft ² /person [245 Btu/hr/person (SH), 205 Btu/hr/person (LH)]
BEQs:	2 persons/room

Design Ventilation:

To ensure a high standard of indoor air quality, ventilation rates will be designed according to ASHRAE Standard 62. This standard requires 20 cfm/person in most instances, but allows for a reduction in ventilation rates if improved filtering or monitoring of CO₂ levels has been implemented. CO₂ sensors will be installed on return air ducts of most air handling systems. Mixed air dampers will modulate, with a minimum percent of outdoor air setting of approximately 20-25%. The outdoor damper will open to increase ventilation if return air CO₂ limits are exceeded. If CO₂ levels are found to be continuously well below the limits, the minimum percentage of outdoor air may be modified to reduce ventilation heating and cooling energy.

Design Acoustic Criteria:

Occupied spaces: 50 NC

Noise Criterion: Noise Criterion curves define the limits that the octave-band spectrum of a noise source must not exceed in order to achieve a level of occupant acceptance. Therefore, for an NC-50 design goal, the background noise level will meet this goal, provided that no portion of the noise level's spectrum lies above the designated NC-50 curve.

Exterior spaces: 80 db at 50'

6.5 Proposed O&M Savings

This ECSM will generate \$100,000 in O&M savings in Year 1.

7. UTILITY INTERRUPTIONS

Conversion of non-chilled water cooling units will require shutdown of the units, resulting in interruption in either heating or cooling depending on season. Johnson Controls will coordinate with MAGTFTC Twentynine Palms to minimize interruptions to space conditioning in any buildings affected.

8. AGENCY SUPPORT REQUIRED

MAGTFTC Twentynine Palms will be requested to provide reasonable access to the facility. Johnson Controls will coordinate with MAGTFTC Twentynine Palms site management personnel to schedule work areas requiring access, at least one week in advance, by providing weekly work schedules. MAGTFTC Twentynine Palms will accommodate reasonable variations in daily work schedules. Schedule based upon contract specified 30-day submittal to design acceptance and notice to proceed on discrete and staged project design package. Schedule is based on the assumption that working hours are flexible, enabling late night construction after building occupants have left.

9. POTENTIAL ENVIRONMENTAL IMPACT

No environmental impact is anticipated as a result of this ECSM and no environmental studies are required. Any asbestos encountered will be responsibility of MAGTFTC Twentynine Palms.

ECSM 2: ENERGY MANAGEMENT CONTROL SYSTEM UPGRADE

EXECUTIVE SUMMARY

This ECSM will upgrade the control systems for the heating, ventilation and air-conditioning (HVAC) systems in selected buildings at MAGTFTC Twentynine Palms with a new digital Energy Management Control System (EMCS). The existing pneumatic and electronic HVAC controls and the obsolete Honeywell 7600 series controllers will be replaced with new Johnson Controls Metasys™ digital controllers. Replacement parts for the Honeywell 7600 series controllers are no longer available. New sensors, relays and other control elements will be installed.

The EMCS will be programmed to optimize control of the HVAC systems to operate equipment more efficiently and reduce energy costs. The EMCS upgrade will improve occupant comfort in many areas through accurate temperature control and by ensuring adequate ventilation. Replacement of pneumatic controllers with digital controllers will eliminate the need to calibrate the controllers. The upgrade will replace many aging control elements that have failed or have reached the end of their expected service life. Zonal thermostats, reheat valves, and VAV controls will be replaced, as will control valves and damper actuators in areas being affected by this measure.

The new EMCS will also control the new chilled water systems to be installed by ECSM 1 Air Conditioning System Upgrade.

Single point remote monitoring and control will be provided by connecting the digital controllers to a new operator workstation (OWS) to be installed in Building 1130 and the existing OWS in Building 1577. Both OWS will provide the operations staff at MAGTFTC Twentynine Palms with an enhanced ability to find, diagnose and solve problems with the HVAC systems. Space temperature settings and operating schedules will be controlled by the operations staff. The building occupants will be permitted to adjust space temperature setpoints only within specified ranges. Energy, operations, and maintenance efficiency will increase and occupant comfort will be improved.

1. DETAILED DESCRIPTION OF ECSM

Most of the existing HVAC control systems are pneumatically or electronically based with simple control strategies. These controllers cannot implement energy conservation strategies such as night setbacks, temperature resets, and optimal mixed air damper control.

The Honeywell 7600 series controllers installed in several buildings comprise an “overlay” system, which provides monitoring and some scheduling capability, but does not directly provide analog control of dampers, discharge air temperatures, and other elements. This system is obsolete and replacement parts are no longer available.

Most air handling units (AHUs) were found to operate continuously during unoccupied periods. Space temperature settings were typically observed at about 72–74° F in summer, while a cooling setpoint of 75° F for office/administrative buildings and 78° F for all others is desired by the MAGTFTC Twentynine Palms operations staff. Several AHUs were found with fresh air dampers

fixed open at air temperatures above 90° F, indicating malfunctioning or non-existent damper actuators and economizers. Mixed air dampers on several units were found closed resulting in an inadequate supply of fresh air are being provided.

The existing control systems, including the Honeywell system, will be replaced with Johnson Controls Metasys digital controllers at selected buildings. A detailed list of the buildings and equipment to be controlled with the upgraded EMCS is found in ECSM 2 Appendix Section 1. The EMCS upgrade consists of the following elements.

- The installation of Metasys UNT, VMA, and/or DX-9100 digital controllers installed at each of the AHUs in the selected buildings, and in the mechanical rooms which house boilers and/or chillers in these selected buildings.
- Metasys controllers will be installed in the three new chiller plants described in ECSM 1.
- Existing HVAC controllers, including the Honeywell 7600, will be removed.
- Discharge air temperature sensors, space and return air temperature sensors, and control relays will be installed on the specified AHU and tie into the digital controllers. CO₂ return air sensors will also be installed on AHUs.
- The Metasys controllers will be connected to existing and new valve and damper actuators to provide modulating control of these devices.
- Electric current sensors will be installed on selected fan and pump motors, and will tie into the digital controllers to provide status of this equipment.
- Manual override timers will be installed in administrative areas to allow operation of the HVAC systems outside of the normal occupancy schedules.
- Hot water heating heat exchanger valves will be controlled by the new EMCS system, and relays will be installed to provide on-off control of pumps and cooling equipment.
- Hot water supply and return temperature sensors, chilled and condenser water supply and return temperature sensors in the new chiller plants, as well as the buildings with stand alone chillers, boilers or hot water heating heat exchangers will be installed and connected to the EMCS.
- Variable speed drives (VSDs) on the new chiller plant chilled water pumps and cooling tower fans will be connected to the EMCS for modulating control of this equipment.
- Relays will be installed for the lighting control points currently picked-up by the Honeywell system in the selected buildings, and will be tied into the Metasys controllers.
- A new Metasys OWS will be installed in Building 1130.
- Software upgrades will be provided for the existing Metasys OWS.
- The new controllers in a single building will be linked by a hardwire connection (N2 bus). The controllers in a single building will be connected to a network control module (NCM) that provides supervisory control of the individual controllers via the N2 bus. In some

cases, an NCM located in one building may be connected to controllers located in adjacent buildings.

- The supervisor NCM controllers will all be linked to the new OWS via a new Ethernet network to be installed by Johnson Controls. An exception is Building 1130, where the existing MAGTFTC Twentynine Palms computer network will be used to communicate with the NCM located in that building.
- The EMCS installation will be engineered, programmed, and commissioned.
- VSDs will be installed on the supply and return fans on AHU-1 and AHU-2 in Buildings 1831 and 1865.
- Control valves and damper actuators will be replaced in all areas included in this measure.
- Zone controls, including thermostats, VAV controls, and reheat valves, will be replaced in all areas included in this measure.

The EMCS will be programmed to disable AHUs during scheduled unoccupied periods. Supply fans will cycle on during unoccupied periods to meet the setback temperature settings. The day-time space temperature settings for single zone systems will also be controlled by the EMCS. Different setpoints will be defined for heating and cooling modes. Mixed air dampers, heating and cooling valves will be controlled together to maintain the desired discharge air setpoint. On some systems, the discharge air setpoint may be reset by outdoor air or return air temperature.

CO₂ sensors will be installed on return air ducts. Mixed air dampers will be controlled to set the minimum percent of outdoor air in response to the measured CO₂ levels. Dampers will revert to minimum position above an outdoor air temperature of about 70° F (economizer).

Hot water heat exchanger valves will be controlled to set the hot water supply temperature in response to the outdoor air temperature. Hot water heating pumps will be disabled when heating is not required. Chillers, direct expansion (DX) cooling units, chilled water pumps, and cooling towers will be disabled if outdoor temperatures fall below the cooling lockout temperature (45–50° F). In buildings with stand-alone chillers, the EMCS will control the chillers to reset the chilled water supply temperature. In the three new chiller plants, the VSDs on chilled water pumps and cooling towers will be controlled by the EMCS in response to the cooling load. Sensors for hot water, chilled water, and condenser water supply and return temperatures sensors will be installed to provide feedback to the EMCS.

From either OWS, the operator can monitor the status of fans and pumps, space temperatures, discharge air temperatures, mixed air temperatures and other parameters. Occupied/unoccupied schedules for the operation of the HVAC systems can be modified as well. These schedules can be overridden at the OWS if required. Hot water, chilled water, and discharge air temperature reset schedules can be modified to find the most efficient settings without compromising comfort. Space temperature setpoints for both heating and cooling can be controlled by the operator. The OWS also can be used to set up trend logs for any of the parameters monitored by the system.

1.1 Assumptions

The following assumptions were made in the development of this ECSM:

- Pneumatic compressors and air dryers are in good working order.
- Work will be completed during normal working hours and reasonable access will be granted to the Johnson Controls installation personnel.

1.2 Inclusions

The following is included in this ECSM:

- All materials including controllers, relays, sensors, HTHW valves, CW valves, conduit, and wiring
- Electrical labor for installation of controllers, relays, sensors, and actuators as well as the N2 bus and Ethernet connections
- Power to all new controllers provided by using existing circuits
- Required transformers, wiring, and conduit
- Where required, electrical components for electrical supply will be removed to the breaker panel and unused breakers left in place and labeled as “spare”
- Repairs will be limited to the replacement of control valves, damper actuators, zone thermostats, VAV controls, and reheat valves
- Materials removed as part of the EMCS installation, will be placed in the MAGTFTC Twentynine Palms disposal bins as directed, or returned to MAGTFTC Twentynine Palms for salvage
- Wells for hot water, chilled, and condenser water temperature sensors
- Software upgrades and programming of the existing OWS in Building
- Engineering, design, project management, programming, and commissioning are included. Drawings of the installed EMCS system, with sequence of operation, will be provided to MAGTFTC Twentynine Palms.

1.3 Exclusions

The following is excluded from the scope of work for this ECSM:

- Costs due to site conditions or MAGTFTC Twentynine Palms requirements unknown at this time
- Repair or replacement of failed equipment not specifically identified for repair/replacement
- Control of equipment not listed in ECSM 2 Appendix Section 1
- Pneumatic controls compressors and air dryers
- Replacement of motor starters
- Service fees associated with using the existing computer network at MAGTFTC Twentynine Palms are excluded

- Provision and removal of disposal bins and receptacles are the responsibility of MAGTFTC Twentynine Palms

Existing conditions of affected mechanical and electrical systems will be documented in photographs and/or writing before the work commences on the affected systems. The documentation will be provided to the MAGTFTC Twentynine Palms contracting officer. Any deficiencies found in affected systems during the course of work will be brought to the attention of the contracting officer. The repairs will be the responsibility of MAGTFTC Twentynine Palms. If desired, Johnson Controls will be available to perform the repairs.

If asbestos is encountered during the implementation of this ECSM, Johnson Controls will stop work at the affected location, and MAGTFTC Twentynine Palms will be responsible for any removal or remediation. When completed, Johnson Controls will resume work at the location. Implementation activities will continue at other unaffected locations.

2. LOCATION AFFECTED

The buildings affected include:

1400 Block: Buildings 1360, 1403, 1412, 1423, 1443, 1541, 1584, and 1587

1600 Block: Buildings 1542, 1547, 1548, 1549, 1552, 1591, 1607, 1616, 1627, 1636, and 1645

1800 Block: Buildings 1737, 1738, 1747, 1748, 1757, 1758, 1825, 1826, 1828, 1830, 1831, 1833, 1839, 1843, 1847, 1848, 1859, and 1865

3. INTERFACE WITH GOVERNMENT EQUIPMENT

This ECSM will interface to the existing HVAC, lighting, and communications equipment in the affected buildings.

The control systems will interface directly with the existing HVAC equipment. The division between the MAGTFTC Twentynine Palms equipment and that of Johnson Controls is between the control device and the equipment controlled or monitored. Everything from the sensor, relay, EP switches or other control devices to the controller, through to the OWS is considered part of this measure.

The ethernet connection between the Metasys Network Control Modules (NCMs) and the OWS will be via the existing MAGTFTC Twentynine Palms network.

4. PROPOSED EQUIPMENT IDENTIFICATION

The data sheets for the proposed equipment included in this ECSM has been provided in ECSM 2 Appendix Section 2.

5. PHYSICAL CHANGES TO EXISTING SITE

This ECSM involves the replacement and upgrading of existing systems and equipment. The method of HVAC control for the building occupants in the buildings selected for EMCS upgrade will change. For single zone systems, the occupant will only have space temperature control within a range set at either OWS. Currently the occupants have control of the thermostats. No other physical changes are required to implement this ECSM.

6. ENERGY SAVINGS PROPOSED

Proposed energy and cost savings are presented in Tables 1 and 2.

Table 1: Proposed Annual Energy Savings

	Electricity			Natural Gas (therms)	Annual Energy (decatherm/ MMBtu)
	Consumption (kWh)	Annual Peak Demand (kW)	Total On-Peak Demand (kW)		
Baseline	84,596,592	17,203	156,337	2,864,253	575,080
Post Installation	83,219,926	17,203	156,337	2,772,412	561,198
Total Savings	1,376,666	0	0	91,841	13,881

Table 2: Proposed Annual Cost Savings

	Electricity	Natural Gas	Total
Baseline	\$9,536,574	\$940,092	\$10,476,666
Post-Installation	\$9,377,210	\$902,431	\$10,279,641
Total Savings	\$159,364	\$37,661	\$197,025

6.1 Analysis

Energy savings were estimated using the Market Manager building energy simulation program. Selected buildings were audited and modeled with Market Manager, with the baseline electrical usage tuned to match the actual metered electrical energy use. The EMCS strategies were applied to the model as a post-installation scenario. The difference between the energy use in the baseline and the post-installation scenarios are the annual energy savings for the modeled building. The electrical demand savings that result from the simulations are small, and are difficult to verify and guarantee. For this reason, demand savings have been excluded from the savings estimates. The following buildings were selected to represent the different types of buildings at MAGTFTC Twentynine Palms:

1. Office	Building 1414
2. 24-hour office	Building 1826
3. Warehouse	Building 1350
4. High bay with office	Building 1239
5. BEQ (barracks)	Building 1664
6. Recreation and Miscellaneous	Building 1584

An overview of the Market Manager program and a discussion of the simulation and calibration procedures, and the basis for selection of the buildings to be modeled is also found in the Baseline Discussion section of the Energy Baseline and ECSM Performance Measurement Appendix.

Savings calculated for each building type were benchmarked against the area of the building. The simulated savings for the representative buildings are summarized in ECSM 2 Appendix section 3. This appendix also contains the Market Manager output data for each building, which details the monthly electrical and natural gas use and costs broken down by end use. The end use output reports are included for both pre and post installation scenarios.

The estimated savings from the modeled buildings were extrapolated to all buildings selected for EMCS upgrades. Savings were applied on a square foot basis to all the buildings included in this ECSM. A total list of buildings and their respective extrapolated savings has been provided in the ECSM 2 Appendix section 4.

6.2 Baseline Assumptions

Each modeled building has its own set of assumptions associated with building the model. Provided below is a detailed list of Market Manager inputs and assumptions for Building 1559. The listed assumptions were made to establish the baseline operating conditions for this building. A matrix of the basic Market Manager inputs and assumptions for each of the representative buildings modeled is found in ECSM 2 Appendix Section 5.

- Walls are 8" and 12" concrete blocks with interior gypsum board. Exterior color is medium. $R = 5.5 \text{ ft}^2\text{F/Btu/hr.}$
- Roof construction is built-up steel deck with 1.5" rigid insulation. Color is light. $R = 5.5 \text{ ft}^2\text{F/Btu/hr.}$
- Floors in all buildings are simulated slab on grade, $R = 3.0 \text{ ft}^2\text{F/Btu/hr.}$
- There are no windows in this building
- Doors are metal. $R = 2.3 \text{ ft}^2\text{F/Btu/hr.}$
- Roof, wall and door air tightness is defined as "average."
- Air infiltration is selected to be included in the load calculations.
- Summer (May to October) space setpoint is 74° F all week, and the winter (November to April) setpoint is 72° F all week.

- Occupancy default is 200 ft² per person. Occupancy schedule varies from high of 75% occupied during the day to 5% at night.
- Lighting
 - Outer office zone has 20 3-lamp T8 fixtures (85 watts each) = 1.7 kW. Weekday schedule varies from 75% on in the day to 30% on at night. Weekend lighting schedule varies from 50% on during the day to 30% on at night.
 - Conference zone has 30 3-lamp T8 fixtures (85 Watts each) = 2.55 kW. Weekday schedule varies from 50% on in the day to 20% on at night. Weekend lighting schedule varies from 30% on during the day to 20% on at night.
 - Control Room zone has 20 3-lamp T8 fixtures (85 Watts each) = 1.7 kW. Weekly lighting schedule is 90% on all week.
 - Public Affairs office zone has 35 3-lamp T8 fixtures (85 Watts each) = 2.98 kW. Weekday schedule varies from 75% on in the day to 30% on at night. Weekend lighting schedule varies from 50% on during the day to 20% on at night.
- Miscellaneous Equipment
 - Outer office zone has assumed equipment density of 1.5 W/ft². Weekday schedule varies from 70% on in the day to 30% on at night. Weekend lighting schedule is 30% all day.
 - Conference Room zone has assumed equipment density of 0.5 W/ ft². Weekday schedule varies from 50% on in the day to 30% on at night. Weekend lighting is 30% on all day.
 - Control Room zone has assumed equipment density of 2.0 W/ ft². Weekly schedule varies from 60% on during the day and 50% at night.
 - Public Affairs office zone has assumed equipment density of 1.5 W/ ft². Weekday schedule varies from 70% on in the day to 30% on at night. Weekend lighting schedule is 30% all day.
- Building 1559 is served by four single zone (variable temperature constant volume) AHUs with chilled water and hot water heat coils. The units are mixed air units with constant percentage of outdoor air (no actuators). Fan schedules estimated from on-site interviews and metering results.
 - AHU-1 serves the conference room. Measured supply fan draws 837 Watts and supplies 2000 CFM. Dampers at 20% outdoor air. Fan schedule availability varies from 75% on during the day to 50% at night.
 - AHU-2 serves the outer offices. Supply fan draws 837 Watts and supplies 2000 CFM. Dampers at 50% outdoor air. Fan schedule availability varies from 75% on during the day to 50% at night.
 - AHU-3 serves the control room. Measured supply fan draws 226 Watts and supplies 900 CFM. Dampers at 10% outdoor air. Fan schedule availability is 100% all week.
 - AHU-4 serves the Public Affairs offices. Supply fan draws 837 Watts and supplies 2000 CFM. Dampers at 30% outdoor air. Fan schedule availability varies from 90% on during the day to 50% at night.

- Cooling source is a 40-ton reciprocating chiller. The part load curves are the default Market Manager curves for a small reciprocating chiller. Peak COP is assumed to be 3.9 (0.9 kW/ton).
- Chilled water and condenser water pumps draw a total of 3.8 kW (assumed 70% load of name-plate hp). Cooling tower is auto-sized by Market Manager.
- Heating is provided by the central plant, and is defined as a boiler auto-sized by Market Manager. Boiler plant overall efficiency is set at the stipulated 78.5%, with 0% standby loss. The part load curve is set to unity, i.e., constant efficiency.
- Heating is locked out above outdoor temperature of 70° F. Cooling is locked out below outdoor temperature of 45° F.
- Chilled water supply temperature is 50° F.
- The Market Manager bin weather temperature data was created from a 20-year average TMY file for Twentynine Palms.

6.3 Post-Installation Assumptions

The following assumptions were made to establish the post installation operating conditions for Building 1559. The post installation operation assumptions for each of the representative buildings modeled are provided in ECSM 2 Appendix Section 5.

- Day time (occupied) temperature cooling setpoint is raised to 75° F during the summer months of May to October. Occupied heating setpoint from November to April is lowered to 68° F.
- Unoccupied temperature cooling setback setpoint is 85° F during the summer months of May to October. Unoccupied heating setback setpoint from November to April is 60° F.
- Zones served by AHU-1, 2, and 4 are set to unoccupied from 5 PM to 7 AM, 7 days per week. The AHU-3 zone is occupied all week.
- AHU-1, 2, and 4 are disabled from 5 p.m. to 7 a.m., 7 days per week. AHU-3 continues to operate continuously. The heating and cooling standby options are selected in the Market Manager model to allow the fan to cycle on and off to maintain setback settings.
- Cooling lockout is increased from 45 to 55° F.
- Modulating damper control is added with an economizer switchover of 70° F.
- Minimum percentage of outdoor air during occupied periods is 25% on each unit.

6.4 Data

Data used in support of this ECSM includes:

- Measured supply fan motor loads
- Supply fan run-time logs

- Space temperature logs to include weekdays and weekend
- Chiller, boiler, packaged unit, fan, and pump motor nameplate data
- Mechanical drawing equipment schedules with heating/cooling equipment capacities and power input, fan CFM, and static pressure
- Lighting fixture quantities from electrical drawings
- Building electrical power metering for baseline model tuning

6.5 Proposed O&M Savings

This ECSM will generate \$100,000 in O&M savings in Year 1.

7. UTILITY INTERRUPTIONS

No major utility interruptions are expected during the implementation of this ECSM.

8. AGENCY SUPPORT REQUIRED

Coordination for access to MAGTFTC Twentynine Palms mechanical equipment spaces will be required. MAGTFTC Twentynine Palms will notify tenants of scheduled activities to take place in their buildings. MAGTFTC Twentynine Palms will notify tenants in advance of any equipment installation and fan system shutdown required. Assistance will be needed from facility personnel during checkout of the EMCS.

9. POTENTIAL ENVIRONMENTAL IMPACT

Hazardous waste is not expected to be generated as a result of implementing this ECSM. Any asbestos encountered will be responsibility of MAGTFTC Twentynine Palms.

ECSM 3: 1.1 MW AC PHOTOVOLTAIC SYSTEM

EXECUTIVE SUMMARY

This ECSM will install a 1.1-megawatt (MW) alternating current (AC) photovoltaic (PV) power generating plant. Photovoltaic is a technology that converts sunlight to electricity using semiconductor solar cells (panels). This PV system will provide electrical power to MAGTFTC Twentynine Palms. This system will displace the purchase of kilowatt-hours of electricity supplied by the local utility or by the new seven MW cogeneration plant currently under construction. The PV installation consists of the PV modules, support structures with single axis solar trackers, and power conditioning electronics with connection to the electrical grid.

This ECSM will provide the following benefits:

- Reduced energy costs
- Reduced emissions from displaced power generation
- Reduced fuel consumption
- Quiet power generation
- Reduction of toxic or other waste byproducts generated
- Low operations and maintenance requirements
- Additional energy independence from the local power grid
- Increased power reliability

The photovoltaic system will be integrated with the new cogeneration installation and will provide additional critical load service.

1. DETAILED DESCRIPTION OF ECSM

Electricity currently is supplied to MAGTFTC Twentynine Palms by Southern California Edison (SCE). In the near future, the new seven MW cogeneration plant will also provide electricity.

This ECSM will implement a 1.1 MW AC PV power generating plant. Upon completion of installation and commissioning, the plant will be operated in parallel with the new cogeneration plant. The CHP operator will monitor the production of power from the PV array and the cogeneration plant with an Allen-Bradley integrated programmable logic controller (PLC) system. The PLC system will be compatible with the cogeneration plant system.

A single axis solar tracking system will be installed to automatically pivot the solar modules to directly face the sun, increasing the effectiveness of the solar modules. The system's tracking capability generates as much as 25% more energy annually than a fixed system. The system will generate maximum power from about 9:00 a.m. to 3:00 p.m. in the winter and about 9:00 a.m. to 5:00 p.m. in the summer. These times correspond to the existing peak load requirements at

MAGTFTC Twentynine Palms. Therefore, the clean and quiet PV system will provide power when it is most needed.

This ECSM includes:

- System design
- Material and installation of the 8,700 BP Solar 150-watt multi-crystalline photovoltaic modules
- Support structures
- MaxTracker™ single axis solar tracking system
- Inverters and isolation transformers including pads
- Required system components and controls
- Installation including interconnection to Substation AA and system commissioning

No existing equipment at the site will require removal, replacement, or modification.

The project design is based upon a 1.0-MW California Energy Commission (CEC) AC PTC rating. The PTC (PVUSA Test Conditions) rating is an industry standard. The PTC watt rating of a PV module is lower than the nameplate rating of the module measured at industry standard test conditions (STC) since the PTC rating takes into account temperature related reduction in module performance. PTC watt rating is based on 1000 Watt/m² solar irradiance, 20° C ambient temperature, and 1 meter/second wind speed. The CEC AC-PTC rating has been adopted by the CEC for its Emerging Renewables Buydown Program and the California Public Utilities Commission for the utility Self Generation Incentive Program. This rating is calculated by multiplying the PTC rating of the PV module as listed on the CEC website times the number of modules times the inverter peak efficiency as listed on the CEC website.

The applicable codes and standards are utilized as the basis of the system design and component selection. Included are all applicable Institute of Electrical and Electronics Engineers (IEEE) and governing National Fire Protection Association (NFPA) and Underwriter's Laboratory (UL) standards (e.g. IEEE 929, NEC 650, UL 1703 and 1741).

The PV system will be installed on the 10 acres of undeveloped land located north of the Building 1588 parking lot. This area is bounded by a drainage ditch to the west and an access road to the east. The site also has an east-west oriented telephone line and power line running through it. Twenty feet of right-of-way will be required for the telephone line and 50 feet of right-of-way (20 feet beyond each power pole crossarm) for the electrical line. The PV system will be offset at least 25 meters from parking lots and other structures.

1.1 Assumptions

The following assumptions have been made:

- All design variables have been based on documented weather using the TMY2 data set for Daggett, California. TMY2 refers to “typical meteorological year” and are data sets of hourly values of solar radiation and meteorological elements for a one-year period.
- PV component performance is the CEC ratings for photovoltaic cells, i.e., AC-PTC ratings.
- Soiling factors are as described in Detailed Energy Analysis section below.
- Minimal grading will be required during the site preparation.

1.2 Inclusions

The following is included in the scope of work for ECSM 3:

- Construction of the 1.1 MW (480 Volts AC, 3 phase) PV array generated at the boundary of the PV system including the inverter/transformer pad and interconnection of the PV system to the cogeneration plant substation currently under construction
- Material and labor for the installation of the photovoltaic modules, single axis tracking system, inverters, transformers, and electrical connections
- Engineering, design, and commissioning
- PLC interface and control logic, integrated with the cogeneration plant
- Site grading including removal of any excess spoils from MAGTFTC Twentynine Palms
- A permanent security fence will be constructed around the perimeter of the array.

1.3 Exclusions

None.

2. LOCATION AFFECTED

This ECSM will only affect the approximately 10 acres of existing undeveloped land located north of the Building 1588 parking lot. No impact on existing buildings, streets, or building systems is anticipated.

3. INTERFACE WITH GOVERNMENT EQUIPMENT

The interface with the government equipment will be at the interconnection to MAGTFTC Twentynine Palms electrical distribution system, upstream of the PV system via the cogeneration plant currently under construction, and to the MAGTFTC Twentynine Palms existing Substation AA.

4. PROPOSED EQUIPMENT IDENTIFICATION

The proposed 1.1 MW AC power plant will include:

- 8,700 BP Solar BP SX 150 (150 watt) multi-crystalline photovoltaic modules

- 11 Xantrex PV100208 (100 kW) inverters with AC/DC disconnects and 208V-480V isolation transformers
- A MaxTracker™ single axis solar tracking system and support structure (14 MaxTracker™ array blocks)
- A PLC-based, N2-compatible data acquisition system with all necessary control logic to effectively manage the on-site power production of the PV system and cogeneration plant
- All wiring/cables, conduit, switches, connectors, combiner boxes, fuses, and lightning protection system.

Manufacturer's literature for major system components specification sheets are provided in ECSM 3 Appendix Section 1.

5. PHYSICAL CHANGES TO EXISTING SITE

No physical changes beyond the installation of the PV system and electrical connections are required to implement this ECSM. While minor grading will be required at the site, no changes will be made to the actual slope of the grade and existing drainage patterns will remain unchanged.

6. ENERGY SAVINGS PROPOSED

Proposed energy and cost savings are presented in Tables 1 and 2.

Table 1: Proposed Annual Energy Savings

	Electricity			Annual Energy (decatherm/ MMBtu)
	Consumption (kWh)	Annual Peak Demand (kW)	Total On-Peak Demand (kW)	
Baseline	84,596,592	156,337	17,203	288,654
Post-Installation	82,276,942	146,434	16,248	280,739
Total Savings	2,319,650	9,903	955	7,915

Table 2: Proposed Annual Cost Savings

	Electricity
Baseline	\$11,938,775
Post-Installation	\$11,546,257
Total Savings	\$392,518

Proposed energy and cost savings are for the “stand alone” PV array. The stand alone savings estimates assume the PV array savings are independent of the cogeneration plant, and does not consider the interactive effects of this ECSM with the cogeneration plant.

6.1 Detailed Energy Analysis

The energy savings calculations are based upon computer simulations of PV generation output utilizing the TRNSYS software program. A detailed description of the TRNSYS software package is provided in ECSM 3 Appendix section 2. The TRNSYS program is an “8760” simulator, which calculates the hourly power output from the PV array over a one-year period, based on the specified weather and solar radiation (insolation) data. The weather data specified is the TMY2 average for Daggett, CA, located near Barstow, CA. A summary of the modeling analysis, including inputs, assumptions, and methodology description is provided in ECSM 3 Appendix Section 2.

The program output of hourly kWh generated by the PV array was averaged for each hour in each month and summarized in a graph provided in ECSM 3 Appendix Section 3. The demand savings are the peak kW production by the PV array in each month. This assumes that the peak PV power production will be coincident with the setting of the demand peak. The output was then reduced to account for build-up of dust on the modules. A different ‘soiling’ factor was used for each month. The soiling factors applied are as follows:

January to April: 99%	May: 98%	June: 96%
July: 91%	August: 86%	September: 84%
October: 95%	November: 99%	December: 100%

Once the energy simulations were completed, the hourly PV power generation (kW) for each month was summed using a spreadsheet into the appropriate utility billing time of use periods. This is the total kWh generated, which equals the electrical energy savings. The hourly PV power generation (kW) was subtracted from the hourly baseline demand to determine the post installation demand. The difference between the maximum baseline demand and maximum post installation demand, for each month and time of use period, is the demand (kW) savings. In this way the different profiles of the electrical demand load, and electrical generation load shape is considered in the determination of the electrical demand savings. A summary of the results of this analysis is presented in ECSM 3 Appendix Section 4.

The appropriate time of use energy rates are applied to the electrical energy and demand savings to calculate the cost savings. See the ECSM Baseline and Performance Measurement Appendix for the rates.

6.2 Baseline Assumptions

The baseline operating condition for this project is assumed to be the energy use baseline established for the cogeneration plant installation at MAGTFTC Twentynine Palms.

6.3 Post-Installation Assumptions

The following assumptions were made to establish the post-installation operating conditions for this ECSM:

- The post-installation hourly and annual PV energy generation values are based upon the TMY2 weather data set for Dagget, CA derived from the NSRD database, and reasonably represents the weather data at Twentynine Palms.
- The demand savings estimates considers that the site's peak electrical demand may not coincide with the peak power output from the PV array.
- Soiling factors described in Section 6.1 as recommendations from the American Solar Energy Society
- Efficiency loss factors as described in the in the TRNSYS program inputs found in ECSM 3 Appendix Section 2

6.4 Data

U.S. government derived solar weather data was used with industry accepted computer software (TRNSYS) to model hourly system performance over a one year period. Weather data was derived from the National Solar Radiation Database (NSRDB) which is based upon measured and modeled data of hourly values of direct beam and diffuse horizontal solar radiation. The NSRDB contains values for global horizontal, diffuse horizontal and direct beam solar radiation for the years 1961-1990. The average of these hourly values over the 30 year period comprise the TMY2 data set utilized for this analysis. Per the National Renewable Energy Laboratory's "Solar Radiation Data Manual for Flat Plate and Concentrating Collectors" ("Red Book") the average values for monthly and annual solar radiation values (kWh/m²/day) for single axis tracking flat plate collectors with a north-south axis at a zero degree tilt for the 30-day period are assumed to have an uncertainty of +/-9%.

The PV components performance was based on manufacturers' specification sheets. Key performance data on these sheets comply with standards independently developed by Government testing laboratories.

6.5 Proposed O&M Savings

No O&M savings are proposed for this ECSM.

7. UTILITY INTERRUPTIONS

No utility interruptions are expected as a result of the implementation of this ECSM. The utility interruptions associated with the cogeneration plant currently under construction will not be affected by this ECSM.

8. AGENCY SUPPORT REQUIRED

A routine environmental site study and clearance will be required by MAGTFTC Twentynine Palms prior to proceeding with the installation of the project. In addition, the contractor will require site access, passes for contractor personnel, and approval of work schedules by MAGTFTC Twentynine Palms.

9. POTENTIAL ENVIRONMENTAL IMPACT

A routine environmental study and clearance of the site will be required of MAGTFTC Twentynine Palms, although no adverse environmental impacts are anticipated. No hazardous wastes will be generated as a result of construction or post-installation operations of the project.

ECSM 4: SKYLIGHTS AND DAYLIGHTING CONTROL

EXECUTIVE SUMMARY

This ECSM will install skylights and daylighting controls in 12 warehouse and vehicle maintenance facilities at MAGTFTC Twentynine Palms. These skylights will provide the required lighting level during daylight hours. The daylighting controls operation will be automatic with limited maintenance requirements.

The implementation of this ECSM will provide the following benefits:

- Improve illumination levels to all affected areas
- Reduce energy consumption
- Extend lighting fixture life thereby reducing maintenance hours and costs

All existing lighting fixtures will remain unchanged. Nighttime operation of the existing lighting controls will not be affected.

1. DETAILED DESCRIPTION OF ECSM

Existing lighting control in the warehouse and maintenance shop areas is achieved via manual switching of the lighting circuit breakers located in the lighting control panel. In many of the buildings, the lighting remains on 24 hours a day.

Skylights and a daylighting controller will be installed in the storage, warehouse and maintenance shop areas in Buildings 1102, 1317, 1337, 1350, 1816, 1817, 1920, 1980, 1954, 2020, 2044, and 2054. All of these buildings have large open areas with high ceilings. Photocells will be installed to sense the light level in the space and turn the lights off via daylighting controllers when pre-established baseline illumination levels are provided by the skylights. The controllers will turn the lights on when measured baseline illumination levels are not available.

In each building, a control panel will be installed that will receive a light-level signal from a photo-sensor installed in one daylighting unit located close to the control panel. The 0 to 10-volt signal from the photo-sensor will be displayed on a LCD screen in the control panel. A potentiometer will also be installed in the control panel which can be adjusted so that its 0 to 10 volt output, displayed on the same LCD screen, matches the photocell reading when the minimal required ambient light level is present.

Whenever the photocell output exceeds this potentiometer set-point value, all lighting contactors will be turned off. When the photocell output drops below this set-point value the lighting contactors will be re-energized and the lights will be re-energized. An adjustable time delay is included that will prevent unwanted switching when small changes of light level occur at the set-point level, due to clouds passing overhead.

A by-pass switch will be installed to override the photocell and allow the light fixtures to remain on.

The daylighting controls operation will be automatic and require only limited maintenance.

1.1 Assumptions

The following assumptions were used to determine project design, cost, and schedule:

- Weather data were based on heating degree-day, cooling degree-day, and mean solar radiation for El Centro, California.
- Building dimensions, ceiling heights, surface reflectance, and other building characteristics vary, as recorded on-site or as supplied by site personnel and engineering drawings.
- Building heating and cooling systems vary, as recorded on-site or as supplied by site personnel.
- Skylights will be single-glazed, white acrylic, with 90% visible transmittance and 65% solar heat gain coefficient, nominal four feet by 4 feet with one-foot well and safety grate.
- Light levels were targeted to match the baseline case general light levels. The Illuminating and Engineering Society North America (IESNA) provides recommended illuminance categories and values for lighting design. Active warehouses (with rough, bulky items) are categorized as working spaces where visual tasks are only occasionally performed require a range of 10–20 footcandles. Repair garages where performance of visual tasks of medium contrast or small size occur require a range of 50–100 footcandles. Recorded baseline measurements in the warehouses were within acceptable guidelines. Recorded baseline measurements in the garages were slightly lower than acceptable guidelines. The proposed quantity of skylights was based on an optimization for overall energy savings, in consideration of lighting, cooling, and heating energy.
- All work will be performed during standard working hours. Standard working hours refers to any 8-hour shift during daylight hours, Monday through Friday. Eight-hour shifts other than during daylight hours can be accommodated, given sufficient notice. Saturday and Sundays are not considered standard working hours.
- Temporary power and lighting will not be required.

1.2 Inclusions

The following is included in this ECSM:

1. Daylighting design and installation includes the designated placement of each unit in each building. The design will depend on a variety of factors such as roof/ceiling space availability, and area below that the unit. AutoCAD drawings to be provided for each building.
2. Modification of existing lighting circuits and furnish lighting controls to allow existing light levels to be adjusted to accommodate the daylighting to be provided.
3. Sealing and flashing of units on roof-top is included.

4. Review of the roof penetrations by a structural engineer. All new installations will be reviewed and certified by a professionally licensed structural engineer.

1.3 Exclusions

The following is excluded from this ECSM:

1. Working above occupied areas—all work to be performed during standard working hours. Designated areas will need to be isolated by safety cones and signs when overhead work is to be performed.
2. Moving of machinery, equipment, furniture, or any other objects located below the ceiling/ roof workspace. Drop cloth will be provided to protect equipment and furniture from sawdust and metal shavings.
3. Handling, removal, or disposal of hazardous materials

2. LOCATION AFFECTED

Skylights, a photocell, and a daylighting controller will be installed in the warehouse and vehicle maintenance areas only in Buildings 1102, 1317, 1337, 1350, 1816, 1817, 1920, 1980, 1954, 2020, 2044, and 2054.

3. INTERFACE WITH GOVERNMENT EQUIPMENT

This ECSM will modify the existing lighting circuits and furnish lighting controls to allow light fixtures to be turned off when sufficient daylighting is being provided.

Johnson Controls is responsible for all equipment installed up to and including as follows for the interface with government equipment:

- For roof penetrations, all new skylights with prismatic dome, integrated metal curb and security grill, metal lightwell, and diffusing lens. The point of interconnection is located immediately upstream and downstream of the contractor supplied roof flashing between the integral metal curb and existing roof.
- For lighting control, the point of interconnection is located at the interception of the lighting circuits at the contactors. The contactors will be controlled by the Pico controller located in the lighting control cabinet near the point of interception.
- For lighting controller power, the point of interconnection is located at the interception of the existing power supply where the tie in will be made.

4. PROPOSED EQUIPMENT IDENTIFICATION

The following equipment is proposed for installation:

- 320 4'x4' Natural Lighting Co., Inc. skylight assemblies to include:
 - Clear prismatic dome

- Aluminum frame and retainer
- Sheet-metal roof curb with integral security grill
- Polar-White aluminum light-well
- Interior diffusing lens

- 12 Allen-Bradley Pico controllers, model 1760-12BWB-NC with photocells

See ECSM 4 Appendix Section 1 for product specification sheets.

5. PHYSICAL CHANGES TO EXISTING SITE

For each of the buildings included in this ECSM, the following physical changes will be made:

- Skylights will be installed
- One photocell will be installed
- One lighting control cabinet complete with lighting controller

6. ENERGY SAVINGS PROPOSED

Proposed energy and cost savings are presented in Tables 1 and 2.

Table 1: Proposed Annual Energy Savings

	Electricity			Natural Gas (therms)	Annual Energy (decatherm/ MMBtu)
	Consumption (kWh)	Annual Peak Demand (kW)	Total On-Peak Demand (kW)		
Baseline	378,354	1,740	145	0	1,291
Post-Installation	47,860	0	0	451	208
Total Savings	330,494	1,740	145	–451	1,083

Table 2: Proposed Annual Cost Savings

	Electricity	Natural Gas	Total
Baseline	\$64,694	0	\$64,694
Post Installation	\$5,395	\$219	\$5,614
Total Savings	\$59,299	–\$219	\$59,080

Energy and cost savings on a building by building basis is provided in ECSM 4 Appendix Section 2.

6.1 Detailed Energy Analysis

The daylighting analysis was performed using the program SkyCalc, a component of the “Energy Design Resources” tools suite available from Southern California Edison as part of their new construction services. SkyCalc is a complex, Microsoft Excel based modeling tool. The analysis takes into account interactive heating and cooling effects.

The SkyCalc analysis is sensitive to the weather data that is used. The data includes how much daylight is available, the intensity of the solar heat, and how much heating and cooling will be needed.

Refer to ECSM 4 Appendix Section 3 for SkyCalc simulation printouts.

6.2 Baseline Assumptions

A sample list of SkyCalc inputs and assumptions for a single building is shown below. The inputs presented are for Building 1102. The following assumptions were made to establish the baseline operating conditions for this building. Assumptions for the establishment of baselines at other buildings are included in the SkyCalc files for each building and are included in ECSM 4 Appendix.

- Location
 - Climate Zone 15 referenced as El Centro, CA
- Building Type is defined as a warehouse
 - Ceiling height estimated at 17 feet
 - Wall color assumed to be off-white paint
 - Wall reflectance assumed to be 50%, ceiling reflectance assumed to be 50%
 - Roof U-value assumed to be 0.057 Btu/(hr° F ft²)
- Shelving/Racks or Partitions
 - Shelf/rack height estimated to be 10 feet, width estimated to be 8 feet, and aisle width estimated to be 15 feet
 - Shelving reflectance assumed to be 40%
- Electrical Lighting
 - System identified as industrial fluorescent with a fixture height of 15 feet
 - Lighting setpoint set at 10 foot candles as measured on site
 - Task height input at 5.00 feet
 - Lighting power density calculated at 0.34 W/ft²
 - Lighting schedule assumed to be 07:00 to 17:00, Monday to Friday.
 - Room and luminaire depreciation set at 80%
- Internal Loads
 - Number of people estimated at 35

- Occupancy schedule and process schedule assumed to be 07:00 to 17:00, Monday through Friday.
- Process (plug) load estimated at 0.20 W/ft²
- Heating and Air Conditioning Systems
 - No air conditioning or heating systems identified

6.3 Post-Installation Assumptions

The same assumptions used in the baseline were made to establish the post-installation operating conditions for this ECSM. The operating hours were adjusted by SkyCalc based on how much daylight is available, the intensity of the solar heat, and how much heating and cooling will be needed.

6.4 Data

The following data was used in support of this ECSM:

1. Field measurements of existing lighting fixture input watts
2. Field measurements of existing space foot-candle lighting levels
3. SkyCalc climate data for El Centro, CA
4. Skylight coverage area measured from available engineering drawings
5. Existing lighting control based on ON/OFF control of breakers

Refer to ECSM 4 Appendix Section 3 for SkyCalc input parameters and ECSM 4 Appendix Section 4 for baseline measurements.

6.5 Proposed O&M Savings

No O&M savings are proposed for this measure.

7. UTILITY INTERRUPTIONS

Minor utility interruptions are anticipated prior to the complete installation of this ECSM. These interruptions will be scheduled in an effort to minimize any inconveniences or impact the mission of base activity. Electrical power to lighting panels in all affected buildings will need to be disconnected in order to modify existing lighting circuits and install lighting controls.

8. AGENCY SUPPORT REQUIRED

Coordination for access to MAGTFTC Twentynine Palms electrical equipment spaces will be required. MAGTFTC Twentynine Palms will notify tenants of scheduled activity to take place in the building. MAGTFTC Twentynine Palms will notify tenants in advance of electrical system shutdown. Assistance will be needed from MAGTFTC Twentynine Palms personnel during commissioning of the daylighting controls and post-installation field measurements.

9. POTENTIAL ENVIRONMENTAL IMPACT

No environmental impact is anticipated as a result of ECSM 4. Environmental permits will not be required. No hazardous waste will be generated as a result of implementing this project.

ENERGY BASELINE AND ECSM PERFORMANCE MEASUREMENT

1. M&V OVERVIEW

The Johnson Controls standard methods for measurement and verification (M&V) of the performance of implemented Energy Savings Conservation Measures (ECSMs) is based on the Federal Energy Management Program (FEMP) manual, "Measurement and Verification (M&V) Guideline for Federal Energy Projects." This document provides guidance on the general approach to M&V for typical ECSMs. The specific M&V approach for the proposed ECSMs is significantly influenced by the availability and accessibility of utility or consumption data per building, the ability to isolate specific loads, and the cost effectiveness of determining the savings.

There are two components to our M&V approach, both of which have been based on input from MAGTFTC Twentynine Palms and discussions during the Feasibility Study. The first component is the demonstration of energy savings potential and has two segments:

- Confirmation that baseline conditions have been accurately defined
- Demonstration that equipment/systems are capable of generating the predicted savings

Demonstration that equipment/systems are capable of generating the predicted savings will be based on, but not limited to, inspections, spot measurement tests, monitoring of consumption data where available, and commissioning activities.

Significant effort was expended by Johnson Controls to ensure an accurate portrayal of the baseline conditions and energy use profiles. This was achieved through the development of Market Manager™ (Market Manager) models.

The second component is the measurement of energy savings. Measurement procedures will be based on the options and methods outlined in the FEMP guidelines. This will ensure accurate accumulation and analysis of data and ease of interpretation for review by the appropriate personnel. M&V appropriate to an ECSM is influenced by the complexity of measuring the specific parameters, identifying the energy savings of individual building(s), isolating the energy savings of individual measures, and the cost of the M&V procedure.

The M&V methods for the four ECSMs in this project are presented in Table 1.

A Post-Installation M&V Report will be provided within 60 days of acceptance of the overall project. Documentation of performance verification in accordance with the following ECSM-specific M&V plans will be provided in the Post-Installation M&V Report. An Annual M&V Report will be provided within thirty days of the end of each performance year. Documentation of performance verification in accordance with the following ECSM-specific M&V plans will be provided in the Annual M&V Reports.

Table 1: Measurement and Verification Methods

ECSM	FEMP Method	Baseline	M&V Methodology
ECSM 1: Air Conditioning System Upgrades	CH-A-02	Calibrated Market Manager Model. Spot measurement of power consumption and the run-time logs were used to verify the performance curves.	Post-installation measurement of Chilled Water plant part-load efficiency. These results will be compared to the Market Manager Model. Year 1 savings resulting from the Market Manager model will be stipulated for Years 2 through 8 of the performance period. Measurements will be performed in Year 9 and the resulting savings will be stipulated for Years 10 through 12. Measurements will again be performed in Year 13 and the results will be stipulated for Years 14 through 16. Finally, measurements will be performed in Year 17 and the results will be stipulated for the remainder of the performance period.
ECSM 2: Energy Management Control System Upgrade	GVL-B-01	Calibrated Market Manager Model.	Spot calibration and verification of Johnson Controls valves and sensors using a statistical sample during the annual services contracted to Johnson Controls. Verification to be performed during commissioning. DDC key sequences of control will be trended daily. Physical verification by control technicians will be conducted on site annually. Failures or incorrect calibration will negatively impact savings.
ECSM 3: 1 MW Photovoltaic System	GVL-B-01	Utilization of engineering models for system design. Historical electrical usage of MAGTFTC Twentynine Palms adjusted to reflect operation of cogeneration plant currently under construction.	Post-installation measurement of PV system output. Post-Installation regression analysis. Energy output will be determined from the regression analysis with the use of the pre-installation modeled weather conditions.
ECSM 4: Skylights and Daylighting Controls—12 Buildings	LC-A-01	Engineering model and short-term measurements of existing lighting loads to verify the loads used in the analysis. Results of spot measurements used for determining baseline will be stipulated.	Verify operation of the installed control components. Determine savings from the percentage of functioning controls and amount of load determined in baseline. Failures or controls that do not operate as designed will negatively impact savings.

2. SUMMARY OF ENERGY CONSUMPTION, SAVINGS AND COST SAVINGS

Summaries of pre- and post-installation annual energy consumption and costs are presented in Tables 2 and 3.

Table 2: Pre- and Post-Installation Annual Energy Savings

ECSM No.	Annual Electricity Consumption (kWh)	Annual Peak Demand (kW)	Total On-Peak Demand (kW)	Annual Natural Gas (Therms)	Annual Energy (decatherm/ MMBtu)
1	2,702,048	1,171	11,739	-58,660	3,354
2	1,273,101	0	0	91,316	13,476
3	2,319,650	9,903	955	0	7,915
4	330,494	1,740	145	-451	1,083
Total	6, 625293	12,714	12,829	32,205	25,828

Table 3: Pre- and Post-Installation Annual Energy Cost Savings

ECSM No.	Electricity	Natural Gas	Total
1	\$435,722	-\$28,389	\$407,333
2	\$143,515	\$36,293	\$179,808
3	\$392,518	\$0	\$392,518
4	\$59,299	-\$219	\$59,080
Total	\$1,031,054	\$7,685	\$1,038,739

3. UTILITY RATES

The applicable utility rates as well as time and temperature readings are presented in the Energy Baseline and Performance Measurement Appendix.

4. DISPUTE RESOLUTION

While energy savings performance contracts are, by their nature, true partnership agreements with mutually beneficial objectives, problems may arise that will require resolution outside of the traditional cooperative environment of discussion, consideration and mutually agreed upon action. Successful resolution of these problems requires prompt, cooperative effort by all parties to the contract. Outlined below is a process for resolution.

Before this protocol is called upon, every effort should be exhausted to informally accord a mutually acceptable agreement between MAGTFTC Twentynine Palms, the Department of the Navy,

and Johnson Controls. However, when it becomes apparent that resolution requires a more formal sounding board, then a mutually agreed upon decision to invoke this procedure should be made. Prompt problem notice is an important requirement for the partnership relationship to flourish and, accordingly, no problem will be considered for this resolution process if it has not been brought to attention within 45 days of when it was known or should have been known by either MAGTFTC Twentynine Palms, the Department of the Navy, or Johnson Controls.

The first step of the process calls for a formal written identification of the problem. This writing is the responsibility of Johnson Controls, and requires prompt communication and problem definition agreement by MAGTFTC Twentynine Palms and/or the Department of the Navy. At the completion of the writing, all involved parties will sign the document acknowledging the problem definition. The problem statement shall also include proposed remedies offered by MAGTFTC Twentynine Palms, the Department of the Navy and Johnson Controls. There is no requirement for agreement on remedies.

By definition, the preparation of this problem statement is a call for third party resolution. Either a mutually agreeable election of a third party to resolve the issue will result from discussions, or failing that agreement, the parties will agree to delegate that selection to the Department of the Navy program manager. It is the responsibility of Johnson Controls to provide the initial name of a third party. Failing agreement, MAGTFTC Twentynine Palms will offer an alternative. Failing a Johnson Controls agreement to this second resource, the Department of Navy program manager will provide the name without the requirement for MAGTFTC Twentynine Palms or Johnson Controls agreement. There is an expectation that an independent consultant, knowledgeable in the problem area, would be selected to resolve the controversy. The consultant will, upon the completion of his deliberations, prepare a record in writing of his findings of fact, opinions and determinations. The cost of the consultant shall be paid for by the non-prevailing party. In the case of partial fault determination, the costs shall be shared proportionately.

ECSM SPECIFIC M&V PLAN—ECSM 1

OVERVIEW

ECSM 1: Air Conditioning System Upgrades will reduce electrical usage through the installation of new central cooling plants designed for cooling a large number of buildings. In addition, the new chiller plants will be integrated into the facility's expanded Metasys™ Energy Management Control System (EMCS), which will provide centralized control of all chiller plants.

Space conditioning provided by the central plants will be more efficient and cost less to operate than individual package-type units.

FEMP M&V Method CH-A-02 for Chiller Replacement Projects has been selected for conducting the annual M&V for ECSM 1. The post-installation efficiency of the chiller plants will be established through measurements and compared to the performance curves of the installed equipment. The specifics of this M&V plan are consistent with previous discussions regarding savings attributable to this measure.

The M&V approach for this ECSM assumes that comprehensive commissioning of all new systems and new equipment associated with this ECSM will have occurred. The commissioning activities will have ensured the functional testing and performance verification of ECSM systems and ECSM equipment.

1. OBJECTIVES

Johnson Controls will validate the energy savings realized from the implementation of this ECSM by:

- Verifying that the performance of the equipment installed is equal to, or exceeds, the performance specified in the ECSM Proposal.
- Verifying that the equipment is being maintained and functioning properly.

2. PARAMETERS TO BE MONITORED

Chiller electrical demand, chilled water flow of each chiller plant, chilled water supply temperature, and chilled water return temperatures will be monitored via the EMCS installed as a part of this project or by stand alone meters. Chilled water temperatures will be measured with sensors with an accuracy of $\pm 2\%$. Chilled water flow will be measured with a calibrated flow meter whose accuracy is both specified by the manufacturer and measured according to Air Conditioning and Refrigeration Institute (ARI) standards. Measurements will be conducted with calibrated power metering equipment with an accuracy of $\pm 2\%$ of reading.

3. SAMPLING PLAN

No sampling is needed since each chiller plant is a part of the M&V plan.

3.1 Designation of Usage Groups

Not applicable.

3.2 Calculation of Population(s) and Sample Sizes by Usage Group

Not applicable.

4. DATA COLLECTION PLAN

4.1 Specific Data to be Collected

Data will be collected by the Metasys EMCS installed as part of this ECSCM and stand alone permanent metering equipment. For the electric chillers, the following data will be collected on an hourly basis for the term of the contract:

- Supply chilled water temperature and flow rate at each chiller plant,
- Return chilled water temperature,
- Condenser supply and return temperature,
- Chiller electric power draw and
- Date and time of each measurement recorded.

A Data Collection Work Sheet for chillers is provided in the Energy Baseline and ECSCM Performance Measurement Appendix, Section 3.

4.2 Identification of Instrumentation

Continuous monitoring of the chillers will be conducted by sensors connected to the new EMCS. Spot power measurements of the post-installation chillers will be taken with a calibrated Fluke Model 39 digital power meter which has an accuracy of $\pm 2\%$ of the reading.

4.3 Calibration of Equipment

Sensors and meters used to collect M&V data will be calibrated to known standards (eg. National Institute Standards and Technology [NIST] standards) to ensure that data collected is valid. Chilled water flow meters will be removed and calibrated prior to the chiller performance monitoring periods in Years 9, 13, and 17. Forms indicating that calibration was performed will be submitted with the Post-Installation M&V Report.

4.4 Data Gathering and Quality Control

Quality control procedures will be in place to assure that measurements and data are within acceptable limits. Interpolation or the use of average values will replace any missing intervals. All data using interpolated values will be identified in the annual M&V report.

The Johnson Controls Performance Assurance Specialist (PAS) will review the collected data and check for completeness, integrity, and accuracy. Anomalous data will be analyzed by the PAS to assure the quality of the data collected.

4.5 Period of Monitoring

Chiller performance parameters will be monitored during each year of the performance period. Data will be collected each quarter to ensure completeness, integrity, and accuracy. The analysis method described in paragraph 5 will be repeated during Year 9, Year 13, and Year 17 to re-establish the measured system's performance curve used as input into the Market Manager model.

5. ANALYSIS METHOD

The electric chiller data collected by the ECSM through field measurements will be segmented into loads near 100%, 75%, 50%, and 25% until the minimum load on each machine is reached. The selection of data will be such that the condenser and chilled water temperatures at these loads follows ARI Standard 550/590. If the unit can not be operated at the above capacities during actual field tests, then the unit will be operated at other points and the efficiency at the 100%, 75%, 50%, and 25% points will be determined according to ARI standards.

If the unit can not be operated at 25% capacity, a calculation will determine this point on the part-load performance curve based on ARI 550/590.

A chiller performance curve will be developed that fits the actual metered data. A minimum of four load points (100%, 75%, 50%, and 25%) will be measured. If the kW/Ton rating is within the ARI tolerance prescribed, no adjustments will be made with respect to the chiller's performance specifications within the Market Manager model.

The ARI standard 550/590 allowable test tolerance on kW/ton will be determined from the following equation:

$$\text{Tolerance in percent} = 10.5 - (0.07 * \%FL) + [1500/(DT * \%FL)]$$

Where:

FL = Full Load

DT = Difference between entering and leaving chilled water temperature at full load in °F

The system's performance curve is established by the post-installation measurements. If these measured kW/Ton ratings are outside of this tolerance, the actual performance measurement for the chiller plant will be entered into the Market Manager model. The model will use the part-load efficiency to compute the energy savings.

If the measured kW/ton rating is within the tolerance prescribed, no adjustments will be made with respect to the energy savings calculated by the Market Manager model.

Since MAGTFTC Twentynine Palms has a time-of-use rate structure, demand savings will be determined according to a defined set of time-of-use periods. Total cost savings will therefore reflect both kWh and kW savings according to the agreed upon rates.

6. PRE-INSTALLATION ENERGY AND FACILITY PERFORMANCE BASELINE

6.1 Equipment/Systems

The baseline equipment affected by this ECSM is identified in detail in the ECSM 1 Description and Appendix.

6.2 Baseline Energy Use

The baseline energy use was determined by the collection of field data with a subsequent comparison to the Market Manager models. The calculations were derived from an assessment of the existing cooling loads, HVAC equipment, condition of the equipment, and operating schedules.

A description of the baseline and how it was created is provided in the Baseline Discussion in the Energy Baseline and Performance Measurement Appendix. The Baseline Discussion provides the rationale for the selection of buildings to be monitored and a description of the Market Manager building simulation program.

The baseline was established with a Market Manager engineering model that represented the chiller loads and resulting energy consumption given the weather conditions and operating hours of MAGTFTC Twentynine Palms. No further adjustments to the baseline are necessary.

6.3 Factors that Influence Baseline Energy Use

Factor that can influence baseline energy use include:

- Level of staffing
- Troop movements
- Unscheduled or unanticipated deployments of military personnel and accompanying augmented training exercises
- End use equipment performance
- Operating hours

6.4 System Performance Factors

This ECSM does not change the existing system's performance factors. Temperature setpoints, hot water flow, and air volumes will not be changed.

7. POST INSTALLATION FACILITY CONDITIONS

7.1 Equipment/Systems

The equipment and accompanying systems proposed as part of the ECSM are identified in detail in the ECSM 1 Description and Appendix.

7.2 Post-Installation Energy Use

Post-installation energy use will be reduced as described in the ECSM 1 Description. The monitoring of post-installation chiller performance parameters will enable a comparison of the expected efficiencies versus the 'actual' installed efficiencies of the equipment. Given the actual chiller performance and the operating hours modeled in the Market Manager simulation, the consumption level of the cooling equipment can be determined.

7.3 Factors that Influence Energy Use

Factors that influence post-installation energy use include:

- Level of staffing
- Troop movements
- Changes in end use equipment performance characteristics
- Operating hours
- Weather
- Changes to the original sequence of operations that were designed and programmed into the new Metasys control system

8. DETERMINATION OF ENERGY SAVINGS

Energy savings for this ECSM will be determined from the post-installation performance (kW/ton) of the chilled water plants as described in the Analysis Method. Savings calculated for this ECSM will be added to current year calculated savings or the last verified savings of the other ECSMs (as applicable). If the sum of calculated savings for all ECSMs is lower than the guaranteed savings proposed, then a shortfall to the guaranteed savings will have occurred.

9. PLAN FOR FUTURE PERIODIC MEASUREMENTS OF ECSM

As described above, long-term monitoring of the equipment installed as part of this ECSM will be performed using the Johnson Controls Metasys control system. The annual reconciliation and summary of energy savings will function as the ultimate determination of compliance with the guaranteed energy savings values.

10. PLAN FOR BASELINE ADJUSTMENTS OF ECSM

Adjustments will be made for operational hours in excess of those used in the baseline calculations.

ECSM-SPECIFIC M&V PLAN—ECSM 2

OVERVIEW

ECSM 2 will reduce electricity usage by implementing specific HVAC control strategies.

Estimated savings were computed using short-term power measurements which were entered into the Market Manager simulation model developed for this project.

FEMP M & V Method GVL-B-01, Generic variable load, has been selected for conducting the M&V for this ECSM.

This method was selected because the new Metasys EMCS provides the monitoring ability to cost effectively verify performance of the building systems. Installing and monitoring building sub-meters was an option reviewed but rejected based on the complexity, cost, and inherent difficulties in isolating individual loads.

1. OBJECTIVES

Johnson Controls will validate the energy savings realized from the implementation of this ECSM by:

- Verifying that the control strategies in each building are being maintained and functioning properly
- Conducting sensor calibrations, and replacements per a statistical sample with the intent to optimize the energy savings of this ECSM.

2. PARAMETERS TO BE MONITORED

A sample of all analog and binary sensors will be installed, inspected, and monitored annually for the term of the contract. The number of samples will be based on the sampling plan described below.

3. SAMPLING PLAN

3.1 Designation of Usage Groups

Each building will consist of a population of sensors. The population in each building will be divided into usage groups based on the sensor parameter being detected: temperature, pressure, flow, current, and power.

3.2 Calculation of Population(s) and Sample Sizes by Usage Group

The samples for each usage group in a building will be determined according to Table 4. The criteria used to create the table were an 80% confidence level and 20% precision, with a coefficient of variation (y) of 0.5. Control points will be rotated each year so that all points are reviewed and calibrated on a rotating basis.

Table 4: Population and Sample Size

Population	4	12	20	30	40	60	80	100	>100
Sample Size	3	6	7	8	9	9	10	10	11

4. DATA COLLECTION PLAN

4.1 Specific Data to be Collected

The setpoints of sensors attached to the Metasys systems will be compared to the actual measurement taken during the calibration of the EMCS sensors. This calibration data will be compiled and the precision of each sensor and the calibration equipment used noted. The information necessary to show the control strategies programmed into Metasys are in place and functioning is recorded. Operator over-rides, setpoint changes or any other control sequence modifications not contained within this ECSM Proposal will be noted as they are found.

Adjustments will be made for operational hours in excess of those used in the baseline calculations.

A Data Collection Work Sheet for EMCS is provided in the Energy Baseline and ECSM Performance Measurement Appendix, Section 3.

4.2 Identification of Instrumentation

Continuous monitoring of control equipment will be performed by sensors connected to the new Metasys control system.

4.3 Calibration of Equipment

Sensors and meters used to collect M&V data will be calibrated to known standards (eg. National Institute Standards and Technology [NIST] standards) to ensure that data collected is valid. Forms indicating that calibration was performed will be submitted with the Post-Installation M&V Report.

4.4 Data Gathering and Quality Control

Johnson Controls will provide qualified personnel for sensor calibration and control system maintenance to calibrate the sensors. The calibration procedures will be consistent with Johnson Controls practices. The measurements taken will be performed to produce results representative of each sensor's physical location and method of sensing the physical element in question. The measurements will be assembled along with the available output from the Metasys showing the sensor setpoints, their precision, the precision of the calibration equipment used, and the control strategies employed to establish the setpoints.

Operational checks will be in place during the performance period via continuous monitoring by the new control systems.

A Johnson Controls PAS will review the collected data, make a comparison of the setpoints against the measurements taken with consideration for the sum total precision of the sensors involved in establishing each setpoint and of the calibration equipment. Anomalous data will be analyzed by the PAS to assure the quality of the data collected.

Calibrated sensors shown to be outside of acceptable tolerance or to be malfunctioning and unable to be calibrated will be replaced.

4.5 Period of Monitoring

Sensor calibrations will be conducted each year of the performance period.

5. ANALYSIS METHOD

The Johnson Controls PAS will assess the differences between the pre-calibrated sensor readings and the setpoints called for by the Metasys system in response to the control algorithms proposed as part of ECSM 2. The Johnson Controls PAS will total the precision of each sensor and the precision of the calibration instrument used to measure the sensor. Using the total precision of the sensor and of the calibration equipment, the PAS will establish an accept/fail tolerance for the sensor. If the difference between the calibration equipment and the value reported by the pre-calibrated sensor are within this tolerance band, it will be considered to be operating within acceptable tolerances prior to the calibration of the sensor.

If the sensor is found to be operating outside of the tolerance, the sensor will be considered to be out of calibration. As a result, the Market Manager simulation model will be adjusted to reflect the magnitude of the sensor's value outside of the tolerance band, with the provision that it is assumed that the sensor drifted from its calibrated value to the current period measured value linearly with time. As a result, all out-of-tolerance sensor adjustments will be one-half the value assessed by the Johnson Controls PAS. This reflects the passing of one year since the previous calibration period and results in an average annual adjustment.

The above-described procedure will be applied to the control strategies for each system described within the Market Manager model where savings have been assessed to the system in question.

Programmable thermostats that were a part of the Market Manager simulation model will impact energy savings dependent on the settings in place. It is assumed that these settings are correct and that no further adjustments or use of building simulations is needed after commissioning.

In the event that MCAGCC Twentynine Palms, or one of its vendors, over-rides or modifies any of the control algorithms/equipment installed by Johnson Controls, no adjustments will be made to the Market Manager model to decrease the savings for that contract year. However, the necessity of calibrating the sensors installed within the scope of this ECSM will continue for the term of the contract.

6. PRE-INSTALLATION ENERGY AND FACILITY PERFORMANCE BASELINE

6.1 Equipment/Systems

The baseline equipment (e.g., existing controls and timeclocks) affected by this ECSM is identified in greater detail in the ECSM 2 Appendix.

6.2 Baseline Energy Use

The baseline conditions are identified in the Market Manager baseline model. Input to Market Manager was derived from an assessment of the existing equipment, operating schedules, control strategies and setpoints. A description of the baseline and how the baseline was created can be found in the Energy Baseline and Performance Measurement Appendix.

Johnson Controls has incorporated the assessed condition of each system's control functions within the Market Manager baseline model.

Existing equipment such as electric lifts, motors, pumps, and other machinery will affect the overall power consumption. Adjustments will be made according to manufacturer's nameplate data or other recognized sources of energy use data. These sources will include the maintenance and operations staff from Johnson Controls and MAGTFTC Twentynine Palms.

6.3 Factors that Influence Baseline Energy Use

The primary factors that influence baseline energy use include:

- Operating schedules of the existing equipment
- Weather
- Variations in facility operating practices
- Mission related service demands
- Equipment condition
- Maintenance practices on all equipment controlled by the EMCS

6.4 System Performance Factors

This ECSM will influence temperatures in the conditioned spaces.

7. POST-INSTALLATION FACILITY CONDITIONS

7.1 Equipment/Systems

The equipment and accompanying systems proposed as part of ECSM 2 are identified in the ECSM 2 Description and the manufacturer's specification sheets provided in the ECSM 2 Appendix.

7.2 Post-Installation Energy Use

Post-installation energy use will be reduced as described in the ECSM 2 Description.

7.3 Factors that Influence Energy Use

The factors that influence post-installation energy use include:

- Maintenance of the EMCS and the equipment it directly controls
- Equipment not directly controlled by the EMCS including machinery used on base
- Changes in facility operational requirements and mission related electrical loads
- Maintenance of the operating schedules and the programmed strategies
- Weather variations

8. DETERMINATION OF ENERGY SAVINGS

Trend data verified to be outside the designated setpoint range will be input into the Market manager model to assess their impact on the annual energy savings. These changes will be input into the Market Manager model to assess their impact on the annual energy savings.

Each of the affected buildings contains lighting, machinery, HVAC, and other electrical loads. Since this ECSM affects only the building controls and HVAC operation, the Market Manager model and the pre-installation measurements will determine energy savings for only the controls and HVAC systems. Lighting and other loads will remain static between the pre-installation and post-installation cases to evaluate savings attributable to this ECSM.

Assumptions in the determination of energy savings include:

- In the absence of this project, the operation of the HVAC equipment would remain the same and the baseline operational hours would remain constant.
- The occupied hours of the facility will remain unchanged for the duration of the project.

Other electrical loads and their consumption have been established in the Market Manager building simulation. A comparison is made between the pre-installation and post-installation consumption. MAGTFTC Twentynine Palms will give notice of any significant installations that affect the energy use and capabilities of the Johnson Controls DDC system or monitoring equipment.

Savings calculated for this ECSM will be added to current year calculated savings or the last verified savings of the other ECSMs (as applicable). If the sum of calculated savings for all ECSMs is lower than the guaranteed savings proposed, then a shortfall to the guaranteed savings will have occurred.

9. PLAN FOR FUTURE PERIODIC MEASUREMENTS OF ECSM

Beginning at the end of the first year after acceptance, Johnson Controls will, on an annual basis, conduct the M&V activities described above and provide an annual M&V report of the ECSMs installed and the resulting savings calculated.

10. PLAN FOR BASELINE ADJUSTMENTS OF ECSM

Since the Market Manager model and supporting analysis procedures utilize a stipulated load, no baseline adjustments are anticipated.

ECSM-SPECIFIC M&V PLAN—ECSM 3

OVERVIEW

The primary purpose of ECSM 3 is to reduce the amount of electricity MAGTFTC Twentynine Palms will have to purchase from the grid. This is accomplished by harvesting the sun's energy with Photovoltaic (PV) arrays instead of obtaining the power through more expensive means.

The “free” energy produced by the PV system, accounting for deviations in weather conditions, will represent the amount of cost savings for MAGTFTC Twentynine Palms.

FEMP M & V Method GVL-B-01, Variable Loads, has been selected for conducting the M&V for this ECSM.

1. OBJECTIVES

Johnson Controls will validate the energy savings realized from the implementation of this ECSM by:

- Continuously monitoring the power production (kW and kWh) of the PV system
- Verifying that the equipment is being maintained and functioning properly

2. PARAMETERS TO BE MONITORED

A dedicated electrical meter will be installed as part of this ECSM. The electrical demand will be continuously monitored in 15-minute increments for the length of the contract. The electrical consumption will be monitored in one-hour increments. Missing or lost data from this meter will be extrapolated from the same length of time as the missing data using the average consumption and demand of prior day(s).

3. SAMPLING PLAN

Not applicable.

4. DATA COLLECTION PLAN

4.1 Specific Data to be Collected

Data will be collected by the Metasys controls system and a dedicated meter installed as part of the implementation of ECSM 3. These systems will collect kW and kWh readings related to the electrical power production.

4.2 Identification of Instrumentation

Points connected to the new Metasys EMCS will perform continuous monitoring.

4.3 Calibration of Equipment

The testing instrumentation, including the dedicated power meter, will be calibrated before installation. No other calibration will occur.

4.4 Data Gathering and Quality Control

Quality control procedures will be in place to assure that measurements and data are within acceptable limits. Interpolation or the use of average values will replace any missing intervals. All data using interpolated values will be identified in the annual M&V report.

A Johnson Controls PAS will review the collected data and check for completeness, integrity, and accuracy. Anomalous data will be analyzed by a PAS to assure the quality of the data collected.

4.5 Period of Monitoring

Electric output will be continuously monitored during each performance year. Data will be collected and recorded each quarter to ensure completeness, integrity, and accuracy.

5. ANALYSIS METHOD

The methodology described below was selected so that the same weather conditions will be used in the pre-installation and post-installation scenarios. These weather conditions are based on 30-year historical norms.

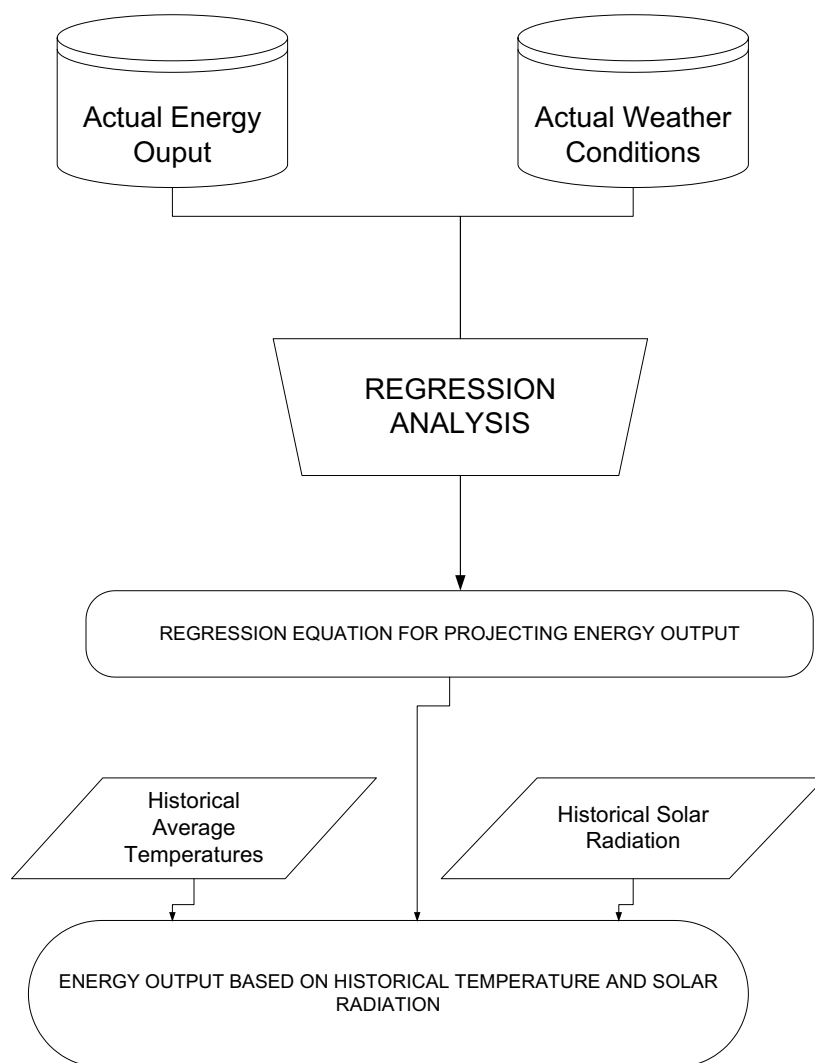
The energy savings have been determined with the use of a computer-based simulation program. The primary independent variables to the model are average monthly outdoor temperature and solar radiation.

To remain consistent with this method of analysis, a post-installation regression model will be established from the actual power production and actual outdoor temperatures and solar radiation. The actual conditions will originate from the nearest weather station where these parameters are recorded on a daily basis.

The post-installation engineering model will be used to determine the actual savings achieved with the implementation of this ECSM.

The following diagram represent the calculation of energy output.

Figure 1: Calculation of Energy Output



An example of this calculation is shown below. The equation and amounts are shown for illustrative purposes. The regression equation and weather conditions will be obtained from actual field conditions.

Following at least 14 months of post-installation performance a regression analysis will produce an equation that reflects the electrical output of the photovoltaic system. The monthly equation, to be used exclusively for this example, may be similar to the following:

$$\text{kWh output}_{\text{PV system}} = -10.4 * A + 949 * B + 72,454 \text{ kWh}$$

Where:

A: The average daily temperature

B: The daily solar radiation

To calculate the electrical output for the month of February 2003, the inputs would be the daily temperature and the amount of solar radiation from the engineering simulation model.

If the average value of A for February 2003 were 78 °F, and B was 247,

$$\text{kWh output}_{\text{FEB}} = (-10.4 * 78 * 28 \text{ days}) + (949 * 247) + 72,454 \text{ kWh}$$

$$\text{kWh output}_{\text{FEB}} = -22,714 + 234,403 + 72,454 = 284,143 \text{ kWh}$$

As demonstrated, the post-installation multivariate regression model was developed from ‘actual’ field conditions. These actual conditions include the energy produced by the Photovoltaic system.

Using the modeled weather conditions, the output of the regression analysis is the amount of electrical energy produced by the system. These amounts will be calculated on a monthly basis.

Since MAGTFTC Twentynine Palms is serviced by a time-of-use rate structure, demand savings will be determined according to the defined set of time-of-use periods. Total monthly cost savings will therefore reflect both kWh and kW savings according to the agreed upon rates.

6. PRE-INSTALLATION ENERGY AND FACILITY PERFORMANCE BASELINE

6.1 Equipment/Systems

The baseline equipment affected by this ECSM is identified in detail in the ECSM 3 Appendix.

6.2 Baseline Energy Use

The baseline energy use was determined from the historical electrical energy use of MAGTFTC Twentynine Palms. The pre-installation energy baseline for the ECSM is presented in the ECSM 3 Appendix section 4.

6.3 Factors that Influence Baseline Energy Use

Weather conditions strongly influence the production of energy associated with this ECSM.

6.4 System Performance Factors

There is no existing system. The new PV system is rated as described in the ECSM 3 Description. The PTC (PVUSA Test Conditions) rating is an industry standard.

7. POST-INSTALLATION FACILITY CONDITIONS

7.1 Equipment/Systems

The equipment and accompanying systems proposed as part of the ECSM are identified in the ECSM 3 Description and the manufacturer’s specification sheets provided in the ECSM 3 Appendix.

7.2 Post-Installation Energy Use

Post-installation energy use will be reduced as described in the ECSM 3 Description.

7.3 Factors that Influence Energy Use

The most significant factors that influence post-installation energy production are the level of solar radiation and temperature. Solar radiation is a function of cloud cover.

8. DETERMINATION OF ENERGY SAVINGS

Energy savings for this ECSM are determined according to the Analysis Method described above. Savings calculated for this ECSM will be added to current year calculated savings or the last verified savings of the other ECSMs (as applicable). If the sum of calculated savings for all ECSMs is lower than the guaranteed savings proposed, then a shortfall to the guaranteed savings will have occurred.

9. PLAN FOR FUTURE PERIODIC MEASUREMENTS OF ECSM

As described above, long-term monitoring of the equipment installed as part of this ECSM will be performed using the Johnson Controls Metasys controls system. The annual reconciliation and summary of energy savings will function as the ultimate determination of compliance with the guaranteed energy savings values.

10. PLAN FOR BASELINE ADJUSTMENTS OF ECSM

Baseline adjustments will be made for unexpected events beyond the control of Johnson Controls that affect the amount of energy produced by the PV system.

The above methodology requires data in excess of 12 months to establish the performance of the system. As a result, the annual report of the PV system's performance will use some data that is interpolated to meet the reporting obligation. The period of data and any interpolations used will be noted.

ECSM-SPECIFIC M&V PLAN—ECSM 4

OVERVIEW

ECSM 4 reduces electrical usage by using available daylighting instead of electrical sources of lighting in selected buildings. Skylights will be installed in 12 buildings: 1102, 1317, 1337, 1350, 1816, 1817, 1920, 1980, 1954, 2020, 2044, and 2054. All of these buildings have large open areas with high ceilings.

Daylighting controls will be installed to control the existing lighting systems in these buildings. Electric lights will be turned off when sufficient light is provided by the skylights. Lights will be turned on when daylight is not available to meet the needs of the individual buildings.

FEMP M&V Method LC-A-01, Lighting Controls, has been selected for conducting the M&V for this ECSM.

1. OBJECTIVES

Johnson Controls will validate the energy savings realized from the implementation of this ECSM by:

- Verifying that the daylighting control strategies and the photo cell sensors (which provide input to the control logic) are being maintained and functioning properly
- Verifying a sample of buildings affected by this ECSM. The results will be compared to the baseline measurements. (i.e., if a daylighting control is either not functioning or has failed, the percentage of electrical load represented by that control will be deducted from the sampled energy savings.)

2. PARAMETERS TO BE MONITORED

A sample of sensors installed under this ECSM will be monitored. Verification and operation of the daylighting controls will occur annually. Baseline measurements have been taken to confirm the total connected lighting load of each affected building.

3. SAMPLING PLAN

3.1 Designation of Usage Groups

The designation of usage groups does not apply since all of the buildings affected by this ECSM are of the same type: large, high-ceiling, warehouse, or maintenance type buildings.

3.2 Calculation of Population(s) and Sample Sizes by Usage Group

From a population of 12 buildings, a sample size of 6 buildings will be selected for verification.

4. DATA COLLECTION PLAN

4.1 Specific Data to be Collected

A Johnson Controls PAS will be onsite semi-annually to perform the audit of at least six sample buildings affected by this ECSM. The data collected will be recorded onto a spreadsheet and included with the annual M&V report. Data to be collected includes:

- Operational status of photocell
- Status of lighting fixtures
- Light levels
- Review of skylight

A Data Collection Work Sheet for daylighting controls is provided in the Energy Baseline and ECSM Performance Measurement Appendix, Section 3.

4.2 Identification of Instrumentation

Metering equipment is not required for the M&V plan for ECSM 4.

4.3 Calibration of Equipment

Not applicable.

4.4 Data Gathering and Quality Control

A Johnson Controls PAS with experience in lighting controls systems will review the collected data, make a comparison of the audited information with the pre-installation measurements taken, and identify the discrepancies. Anomalous data will be analyzed by the PAS to assure the quality of the data collected.

Sensors operation found to be outside of acceptable tolerance, or to be malfunctioning, will be replaced in accordance with the provisions contained within the contract.

Anomalous data will be analyzed by a PAS to assure the quality of the data collected.

4.5 Period of Monitoring

Monitoring will be conducted annually during the performance period.

5. ANALYSIS METHOD

Each year the number of daylighting controls that are either malfunctioning or have failed will be determined from a sample size of at least six buildings. The sample size is consistent with the criteria established in the sampling plan.

The lighting load of the controllers that have failed will be deducted from the total sampled lighting load. If the amount of time that a particular controller was inoperable is unknown, then the assumption will be that it was inoperable for 50% of the evaluation period.

The percentage of the “failed” lighting load divided by the ‘total sampled lighting load’ will be applied to the total projected savings for the contract year.

For example, if the failed controller was connected to 6 kW of lighting load (and it was unknown for how many hours the controller was inoperable) and the total sampled lighting load was 24 kW, the reduced ECSM savings would be:

$$(6 \text{ kW} / 24 \text{ kW}) * 50\% = 12.5\% \text{ reduction to the total projected savings}$$

6. PRE-INSTALLATION ENERGY AND FACILITY PERFORMANCE BASELINE

6.1 Equipment/Systems

The baseline equipment affected by this ECSM is identified in detail in the ECSM 4 Description and ECSM 4 Appendix. The baseline equipment consists of the existing lighting systems that will remain intact. This ECSM affects only the operational hours of these systems.

6.2 Baseline Energy Use

The baseline equipment and systems are described in the ECSM 4 Description. The calculations were derived from an assessment of the existing equipment, operating schedules, and light levels.

The pre-installation energy baseline for ECSM 4 is presented in the Baseline Discussion provided in the Energy Baseline and Performance Measurement Appendix. A description of these values, as well as the measurements taken to establish the baseline, are presented.

6.3 Factors that Influence Baseline Energy Use

The primary factors that influence baseline energy use include:

- Operating schedules of the existing lighting equipment
- Weather
- Variations in facility operating practices and mission related service demands

6.4 System Performance Factors

Manufacturer recommended operation and maintenance is designed to extend the life of the photocells and to ensure that optimum performance is achieved.

7. POST-INSTALLATION FACILITY CONDITIONS

7.1 Equipment/Systems

The equipment and accompanying systems proposed as part of ECSM 4 are identified in the ECSM 4 Description and in the manufacturer's specification sheets provided in the ECSM 4 Appendix.

7.2 Post-Installation Energy Use

Post-installation energy use will be reduced as described in the ECSM 4 Description. Johnson Controls has incorporated the assessed condition of each system's control functions within industry standard software (SkyCalc) for calculating post-retrofit conditions.

7.3 Factors that Influence Energy Use

Since this ECSM is based strictly on how the lighting equipment is used, the factors that influence post-installation energy are identical to those that influence the pre-installation energy use. These factors include:

- The operating schedules of the existing lighting equipment
- Weather
- Variations in facility operating practices and mission related service demands

8. DETERMINATION OF ENERGY SAVINGS

Energy savings will be determined based on the Analysis Method described above. Savings calculated for this ECSM will be added to current year calculated savings or the last verified savings of the other ECSMs (as applicable). If the sum of calculated savings for all ECSMs is lower than the guaranteed savings proposed, then a shortfall to the guaranteed savings will have occurred.

9. PLAN FOR FUTURE PERIODIC MEASUREMENTS OF ECSM

Each year, the performance of the lighting systems in the affected buildings will be evaluated. The annual M&V report will include a description of each building, the lighting system load in each affected building, the lighting systems that were sampled according to the sampling plan, and any reductions to the energy savings as determined in the Analysis Method.

10. PLAN FOR BASELINE ADJUSTMENTS OF ECSM

Since the engineering model and supporting analysis procedures utilize the existing loads, no baseline adjustments are anticipated.

MANAGEMENT APPROACH

The Johnson Controls team has developed this energy savings performance contract project in conjunction with MAGTFTC Twentynine Palms Facilities Management Division (FMD) and the Department of Navy ESPC team at Port Hueneme. This project builds upon our relationships, experience, and understanding of the needs of MAGTFTC Twentynine Palms. The project incorporates savings generated by Project 2 (Cogen) in a combined project that supports the proposed Project 3 ECSMs.

We have included several members of the architectural and engineering (A&E) and construction community into our team to deliver the best value project possible. Supporting our local organization are all of the resources within Johnson Controls dedicated to serving the Federal Government, including program management, performance reporting, and experienced project management teams.

The Johnson Controls MAGTFTC Twentynine Palms ESPC project organization is presented in Figure 1. A detailed organization chart of the construction team is presented in Figure 2.

1. SITE PROJECT MANAGEMENT

Our Performance Contracting Project Management System (PCPMS), based on over 1,600 successful performance contracts, provides a cohesive, effective mechanism for managing project work scope, schedule, and budget. These policies, procedures, and tools will be employed by the Johnson Controls MAGTFTC Twentynine Palms Project Manager to exceed the customer's expectations and achieve the best results for this project. The quality of this effort is assured through the Johnson Controls proven quality control system, which provides the project manager with the tools necessary to attain quality objectives and minimize project risk. Johnson Controls is ISO 9000 certified.

The Johnson Controls cost and schedule management system is well established. To control work scope, costs, and schedules, PCPMS creates a feedback and control system. Emphasis is placed upon creating a detailed scope, schedule, budget, and technical performance plan. Actual performance is carefully monitored and compared to plan. Where performance and plan deviate significantly, variances are highlighted and analyzed for appropriate management action.

1.1 Cost Control

Because Johnson Controls bears the cost risk of fixed price performance contracts, we carefully control the ECSM investment costs so that they do not exceed their recovery through fixed annual payments. Effective control depends upon an accurate budget plan, frequent monitoring of costs, and rapid response to cost problems should they occur.

Figure 1: ESPC Project Organization

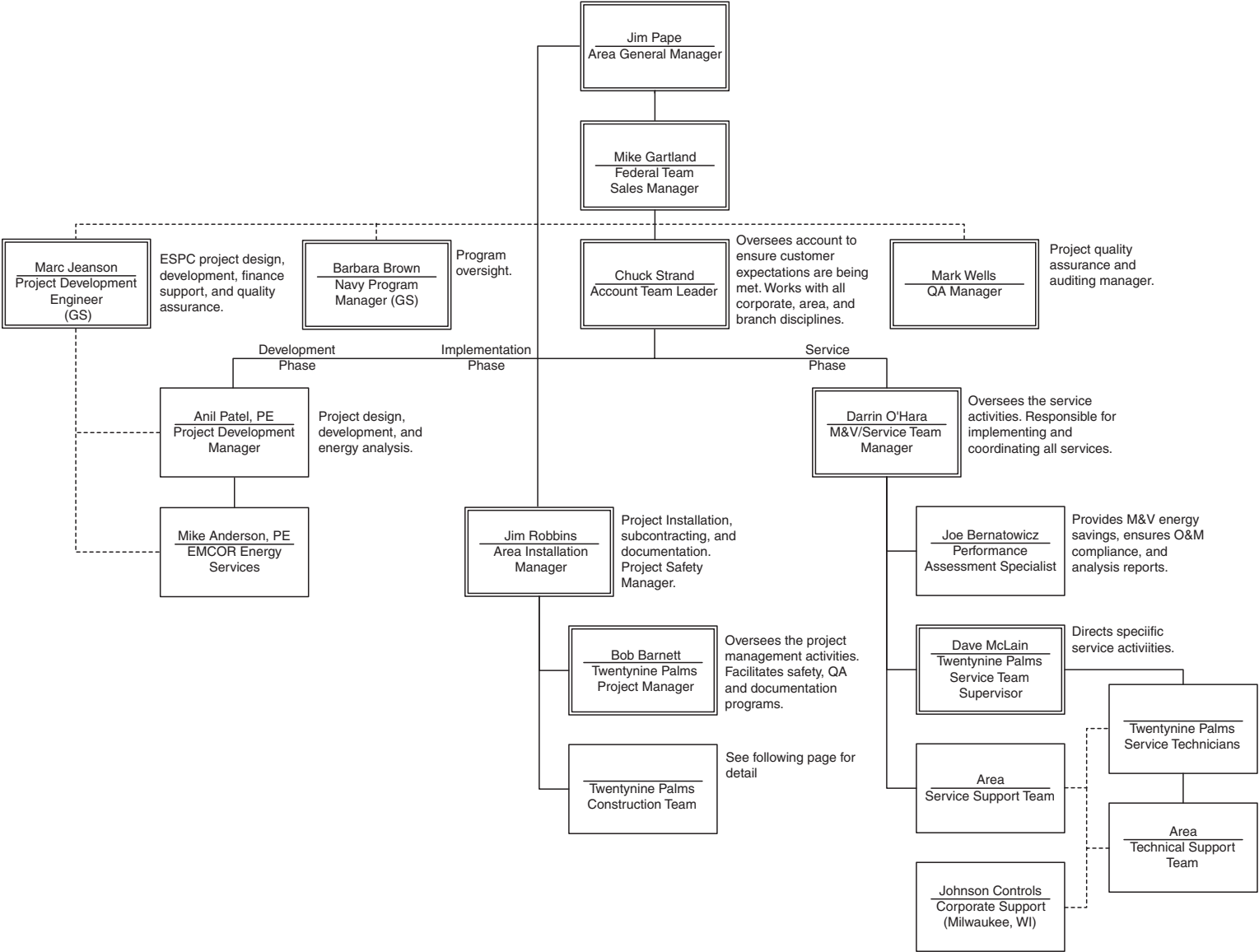
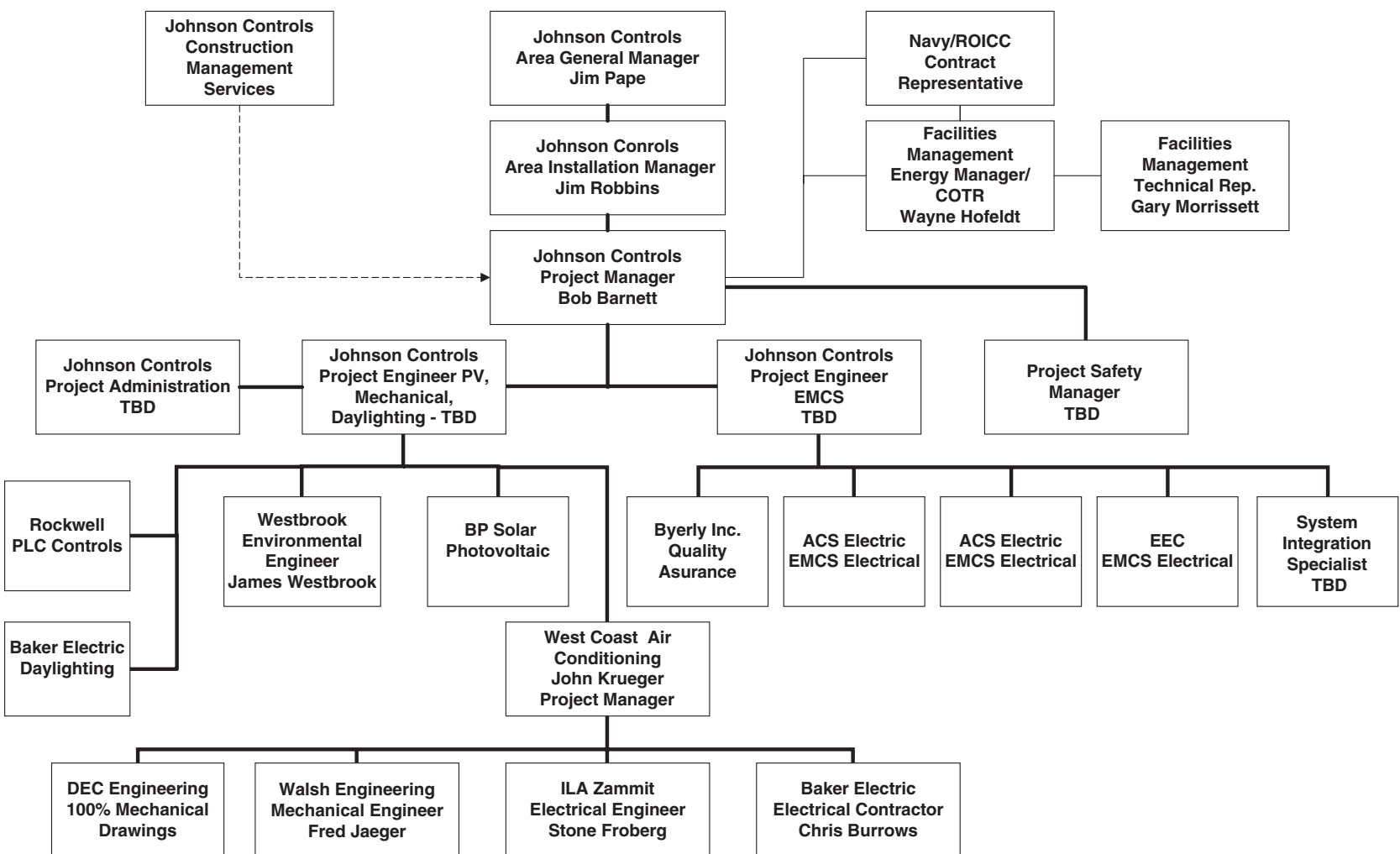


Figure 2: Construction Team



1.2 Total Project Control

The Project Manager is vitally concerned about predictions of future cost, schedule, and technical status. These values are reported by PCPMS in sufficient time to prompt effective management response. Schedules are reviewed daily and predictions of milestone completions are recorded. Technical performance is verified through physical inspection and measurements of energy savings. Reports to document unsatisfactory performance are prepared, indicating the nature of the problem and corrective actions that must be taken to resolve the problem.

Whenever schedule, cost, or technical projections indicate a developing problem, they are brought to the attention of project management for appropriate action. The Job Progress Meeting presents a forum for all participants (the customers, Johnson Controls and subcontractors) to resolve problems. The Project Manager holds these meetings on a weekly basis to review project status and direct appropriate actions.

1.3 Identifying Qualified Subcontractors

Johnson Controls has established rigorous subcontract management guidelines to ensure that project requirements are satisfied and that installation proceeds in an orderly manner. We base these specific procedures for managing subcontractors upon several decades of experience in the construction industry. The Johnson Controls Subcontract Management Guide standardizes and documents these procedures.

The Southern California Area office actively pursues qualified subcontractors within its geographical area. The Project Manager is responsible for this effort. This is an outreach, information gathering, and database maintenance activity. We maintain a list of qualified contractors that have the capability to perform project-related tasks in the geographic region. Prospective subcontractors are selected for inclusion on the list based upon the quality of their work, the timeliness of their delivery, and their financial strength.

1.4 Selection and Monitoring of Subcontractors

The Johnson Controls Project Manager is responsible for controlling the cost, schedule, and technical performance of the project, including all subcontractors. Based upon years of project management experience, we use our best practices to plan and control subcontractor performance. The Johnson Controls Project Manager is fully empowered to use the tools and methods he feels will best accomplish the project objectives.

Effective subcontract management is the result of planning, control, communication, and coordination. Because the terms of a subcontract are critical in controlling subcontractor performance, the scope, schedule, and budget plans are clearly defined in each subcontract. Firm fixed price subcontracts limit cost risk and regular inspections assure adequate technical performance. Frequent communication between the Project Manager and the subcontractor, on site and at Job Progress Meetings, leads to coordinated solutions to emerging problems before they become significant.

Low price is not the overriding criterion for selecting a subcontractor. The quality of previous work, history of working with Johnson Controls, overall technical ability and compliance to the specification are also considered. Our object is to obtain the best value for the successful installation of the ECSCMs.

2. PROJECT SCHEDULE

The Johnson Controls scheduling methodology is the key to our success. The Project Manager assesses schedule accomplishment daily, and marks schedules to show progress. When potential problems are detected, they are discussed with the responsible subcontractor or foreman daily and at Job Progress Meetings. Recovery plans are generated or schedule revisions published and communicated to all parties. The supporting relationships between the three levels of scheduling are not compromised, and lower-level schedules continue to be an extension of higher-level requirements. In this way, the planning documents remain useful tools over the life of the project.

A detailed project schedule is presented in Figure 3 at the end of this section.

3. PROJECT RESPONSIBILITY FOR MAINTENANCE AND REPAIRS AND REPLACEMENT

The 46-State Energy Savings Performance Contract prescribes a true partnering relationship between the agency and the contractor. Responsibilities for operations and maintenance and for the repair and maintenance activities are detailed below.

3.1 Operations and Maintenance Responsibilities

Contractually, Johnson Controls is responsible for ensuring the proper operation and maintenance of all ECSCM equipment installed under this task order. The parties to this task order have agreed that MAGTFTC Twentynine Palms staff will provide the day to day operation of the equipment and systems installed as part of the ECSCMs and initial response and troubleshooting in the event of a system problem. Beyond that, responsibility for correcting ECSCM equipment malfunctions passes to Johnson Controls if the initial diagnosis points to the need for intrusive inspection or if the problem cannot be resolved by MAGTFTC Twentynine Palms. In such cases, Johnson Controls will provide next business day response through the site-based technical support team and will have the ECSCM equipment back on line within 72 hours.

Maintenance contracts will be established with the major equipment manufacturers for the Daylighting System and the Photovoltaic system. The Daylighting and Photovoltaic maintenance contracts will be managed by Johnson Controls.

Johnson Controls will supply operational consumables and labor to support maintenance and repairs to ECSCM equipment installed under this proposal. FMD personnel will typically perform the following tasks in accordance with the manufacturer's instructions or as modified by Johnson Controls:

- Checking and adding lubricants
- Replacing air filters

- Physical operating inspections
- Annual Cleaning of Skylight lenses
- Testing and adding chemically treat water

Johnson Controls will provide the ongoing preventive maintenance and predictive diagnostics of the ECSM equipment to ensure the longest possible life cycle at the highest system efficiency. Johnson Controls will also provide quality control surveillance on a routine and recurring basis to ensure that the correct O&M procedures are being executed. Opportunities for joint training of FMD and Johnson Controls personnel will also be provided. In the event discrepancies are uncovered in either the design or the execution of these O&M procedures, Johnson Controls will provide a root cause analysis and work with MAGTFTC Twentynine Palms staff to initiate corrections and improvements.

Sample O&M Tasking Schedules are provided in the Management Approach Appendix.

Johnson Controls will provide on-site systems support for all basewide EMCS with an assigned operations person for a 40-hour work shift per week. This support person will provide MAGTFTC Twentynine Palms with operating expertise, training, and troubleshooting/maintenance support for the installed EMCS (new and existing). The systems support role will provide operational support to the base SCADA systems. The systems support operator will provide recommendations to MAGTFTC on operational processes and additional energy savings strategies. Additionally, the systems support operator will act as a liaison for EMCS issues and the MAGTFTC site mechanical/electrical/plumbing staff for needed systems repairs, upgrades, and training. Two additional technicians, one HVAC mechanic and one EMCS specialist, will also be on-site 40 hours per week to perform maintenance and repairs on installed ECSM equipment. For trouble calls related to installed ECSMs, Johnson Controls personnel will be dispatched from the FMD Workorder desk. Normal service hours will be determined jointly by agreement between FMD and Johnson Controls.

Ensuring that the ECSMs are consistently and correctly operated throughout the duration of this task order term is the responsibility of MAGTFTC Twentynine Palms with oversight provided by the on-site Johnson Controls technical support team. Johnson Controls will be responsible for equipment maintenance and repairs/replacement throughout the performance period. To that end, the Measurement and Verification approach described in this ECSM Proposal establishes a regular and periodic means for early detection and the opportunity for correction of any variances.

3.2 Repair and Replacement Responsibilities

Johnson Controls will provide on-site repair and replacement of the newly installed ECSM equipment. The planned repair coverage will continue for the entire term of the performance period. All required support will be dispatched from the FMD Workorder Desk to our site field personnel during normal business hours. In the event the site field personnel cannot be reached or after normal business hours, the Johnson Controls Dispatch Center can be reached at 1-800-866-7378. After normal weekday hours and on weekends and holidays, responsibility for responding to emergency service requests is transferred to our National Call Center, which is accessed through the same number. The National Call Center representative will contact the on-call service provider who will

respond to the site. Calls dispatched outside of normal business hours will be billable at standard Johnson Controls published rates for overtime Labor and Material services.

MAGTFTC Twentynine Palms agrees that during the term of this task order that Johnson Controls will be notified immediately of any equipment malfunction, breakdown, or other condition affecting the operation of the covered equipment. Accordingly, should Johnson Controls encounter any adverse operations or maintenance issues on site, the issues will be promptly reported to the designated MAGTFTC Twentynine Palms representative.

4. DISPOSAL OF HAZARDOUS WASTES

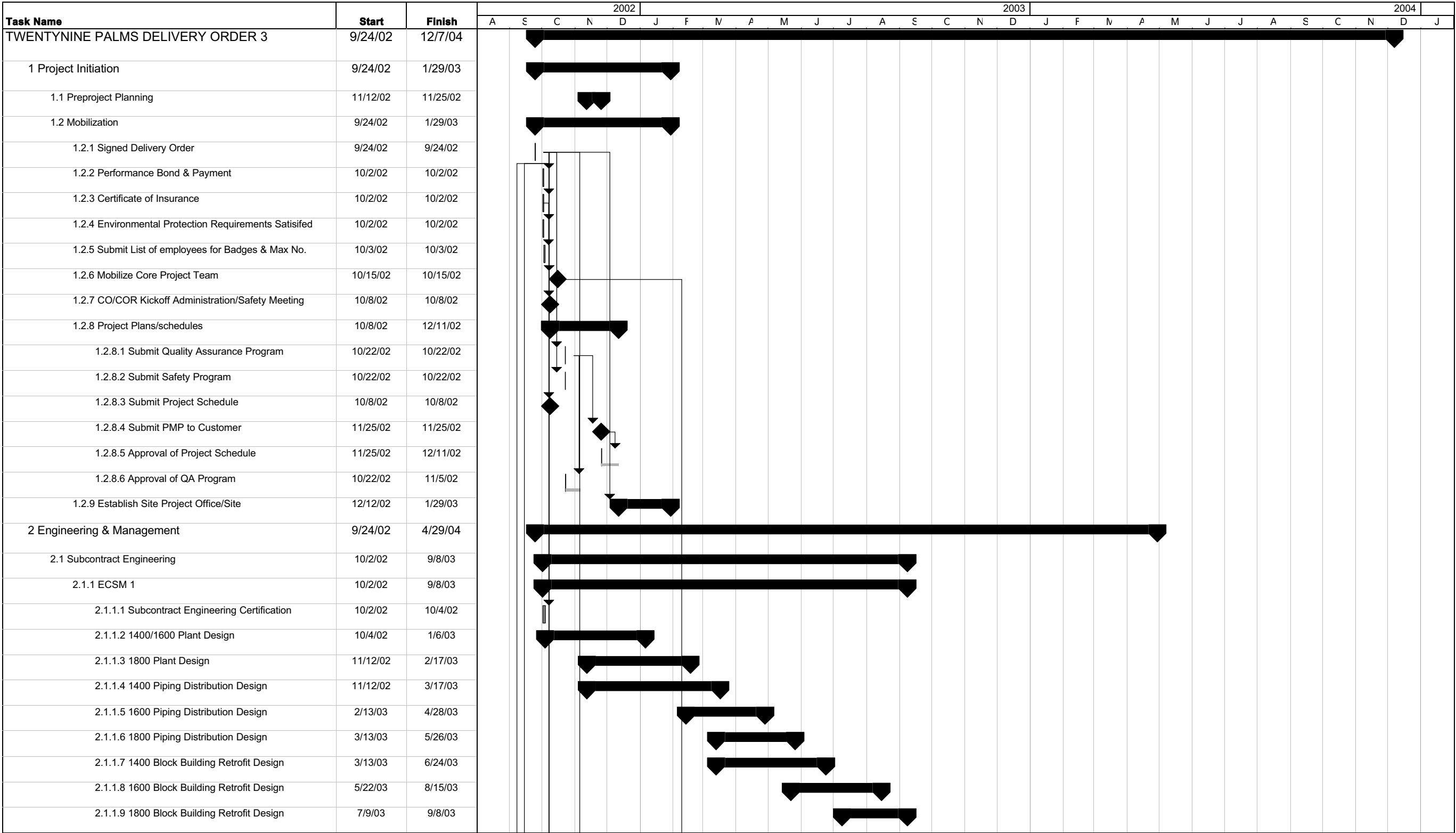
Hazardous materials encountered during installation or during the ongoing service phase as part of this project are the responsibility of MAGTFTC Twentynine Palms.

5. TRAINING

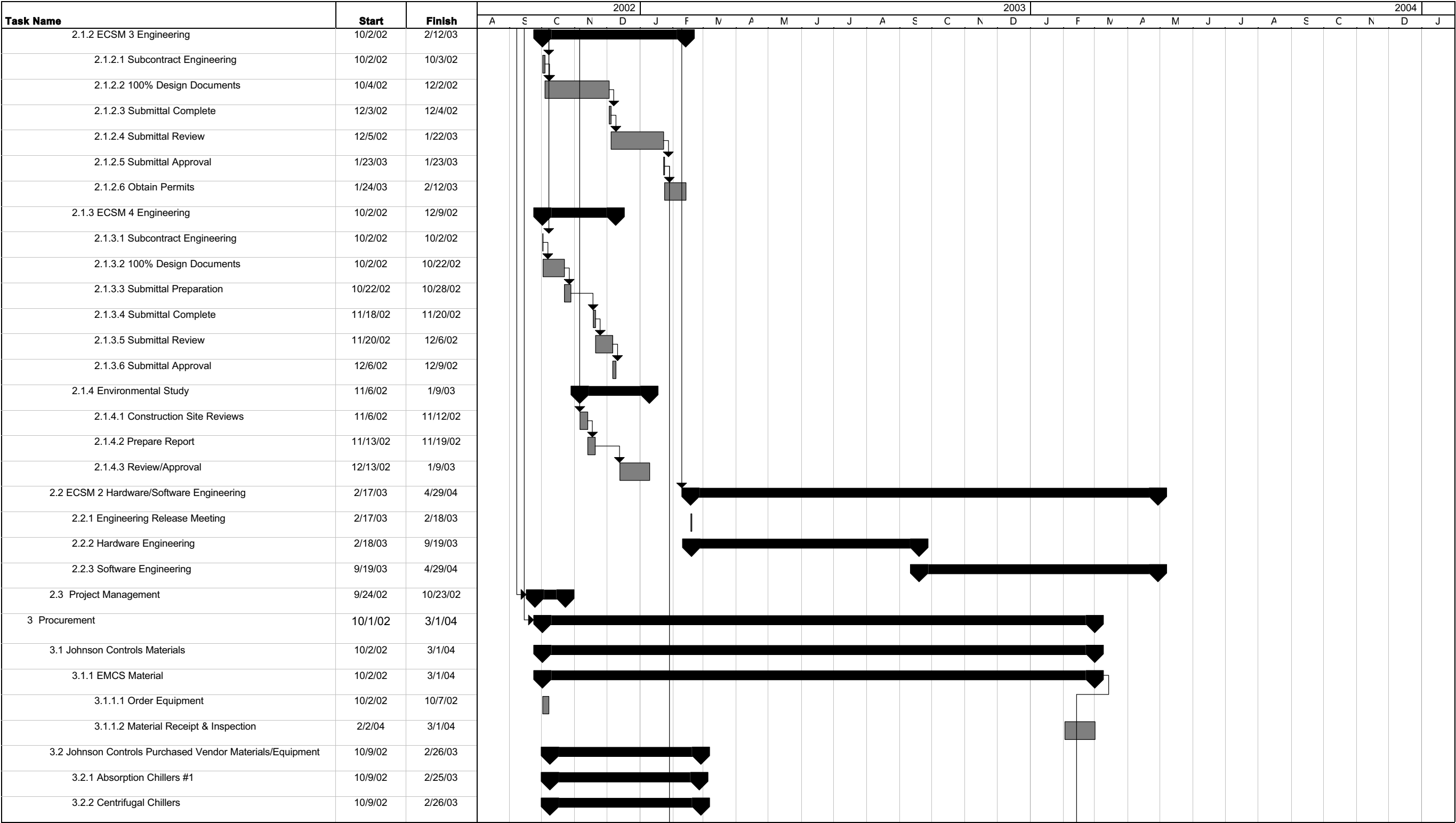
Training will be provided on operational requirements of the installed ECSMs. On-site technical support services will be provided under the contract to provide for joint operational training for the term of the contract. The proposed training will be conducted on site at MAGTFTC Twentynine Palms and will include the following topics:

- System operating parameters, normal and abnormal
- Sequence of operation of central chiller plant equipment
- Purge systems, oil circuits, and capacity control components
- Operator interface with microprocessor controls
- Skills necessary to set or change the equipment operation
- Troubleshooting techniques to identify and isolate problems

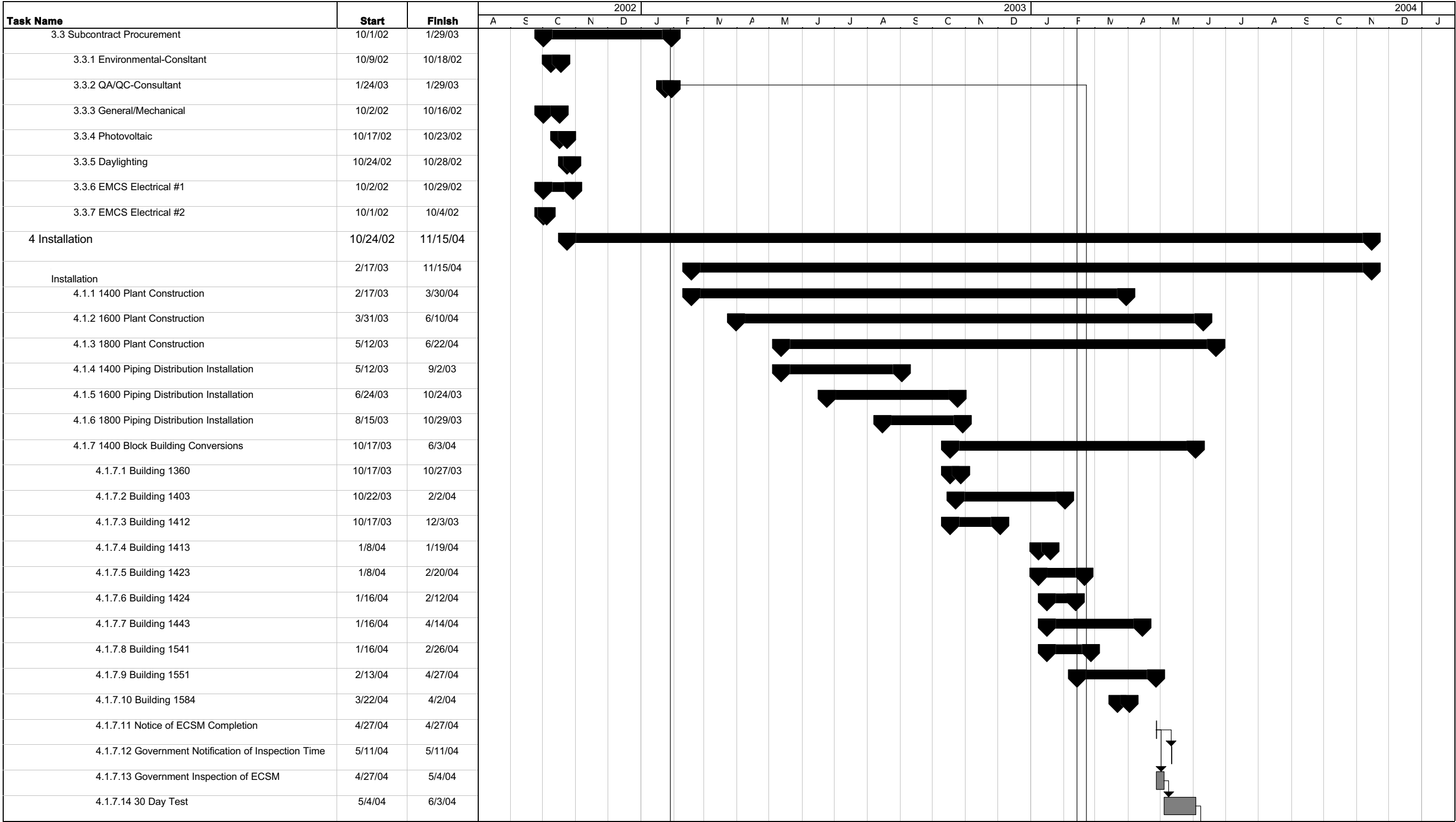
MAGTFTC TWENTYNINE PALMS PROJECT 3 SCHEDULE



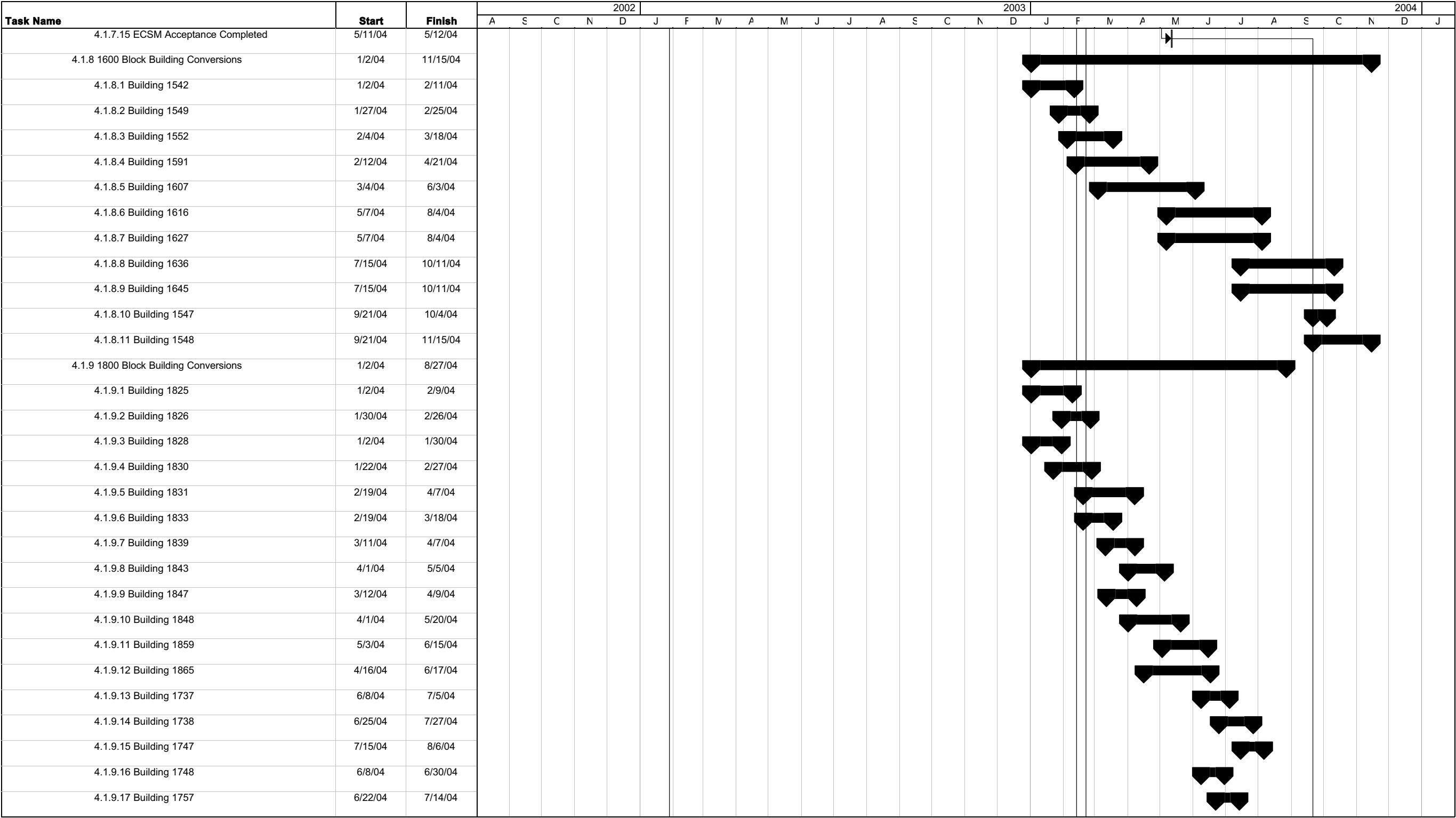
MAGTFTC TWENTYNINE PALMS PROJECT 3 SCHEDULE



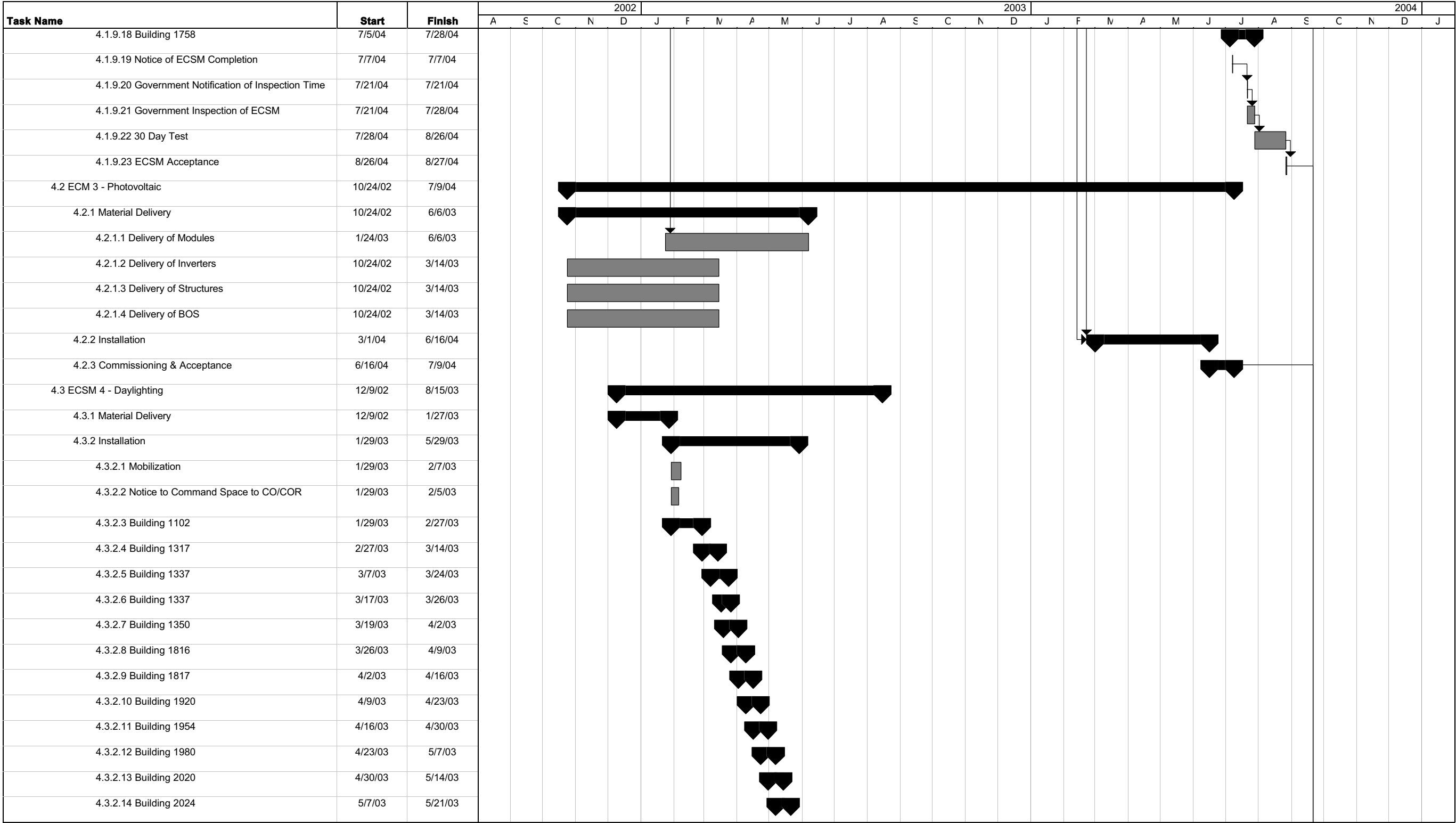
MAGTFTC TWENTYNINE PALMS PROJECT 3 SCHEDULE



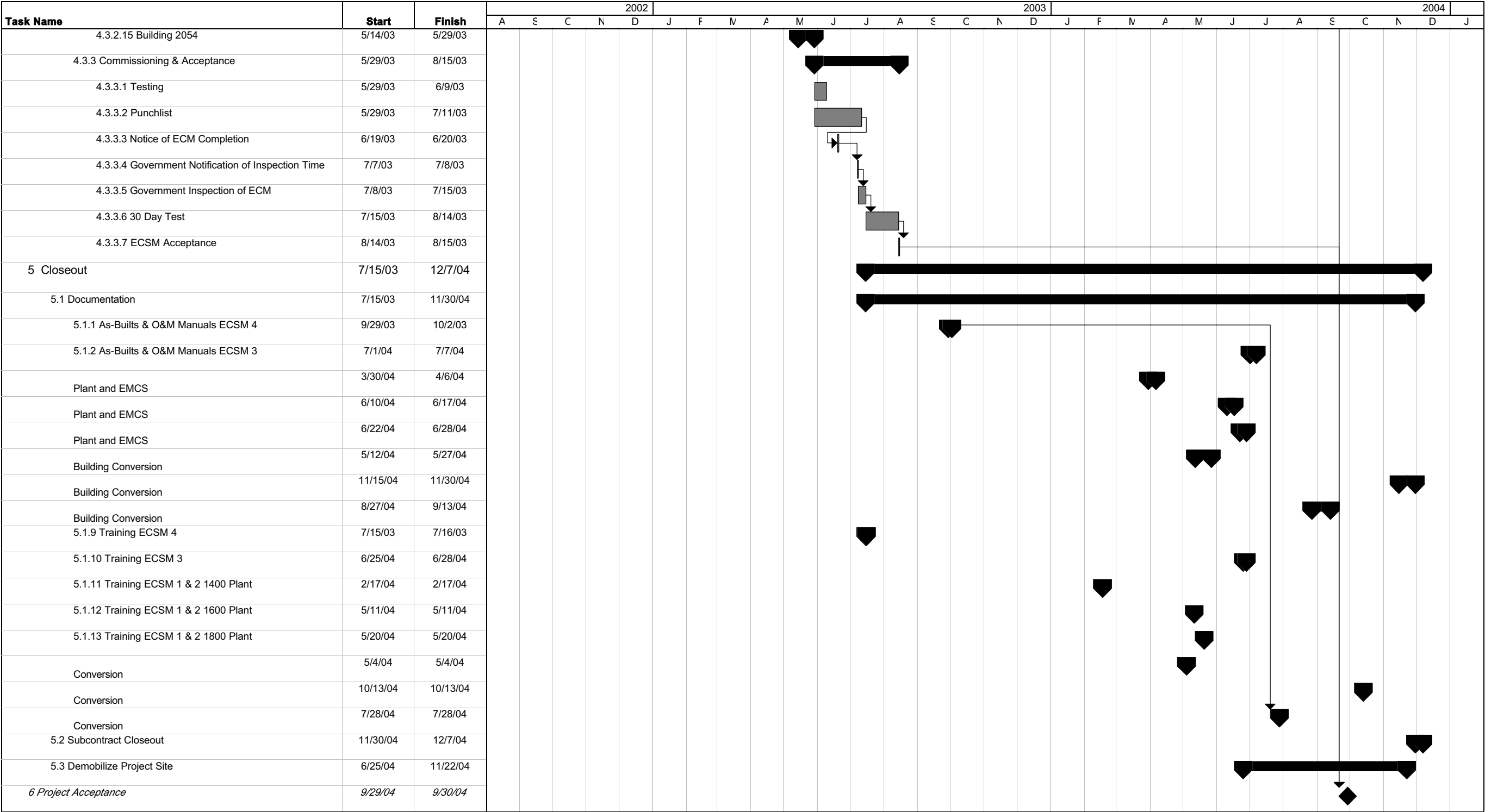
MAGTFTC TWENTYNINE PALMS PROJECT 3 SCHEDULE



MAGTFTC TWENTYNINE PALMS PROJECT 3 SCHEDULE



MAGTFTC TWENTYNINE PALMS PROJECT 3 SCHEDULE



PRICE PROPOSAL

SUMMARY

Johnson Controls is pleased to provide this Price Proposal for an ESPC project at MAGTFTC Twentynine Palms. The attached price schedules H-1 through H-5 and supporting documentation provide the required details for this ECSM Proposal. In accordance with the Government's intent, Johnson Controls is proposing that Task Order 2 (EJP3) be modified to incorporate the ECSMs of this Final Proposal.

As this is a significant modification to an existing Task Order, a unique opportunity is created. Johnson Controls has made every effort to take advantage of this opportunity to minimize construction interest payments and maximize new infrastructure improvements, provide additional independent and renewable power generation capacity and enhance the quality of life at MAGTFTC Twentynine Palms through additional human and financial resources to maintain the equipment proposed. Significant elements of how Johnson Controls proposes to accomplish this are:

- Application of the One-time Government Cash Contribution on the date of the modification to the Task Order.
- Receipt of Utility Incentive by Johnson Controls at Acceptance of ECSM 3, 1.1 MW AC Photovoltaic System.
- Provision for additional One-time Government Cash Contributions to Johnson Controls according to the Progress Payment Schedule included.
- Payment from construction period savings as a result of the Acceptance of individual ECSMs also detailed in the Progress Payment Schedule.

The net effect of the above elements results in a reduction in the amount of capital investment that must be financed.

To facilitate the modification of Task Order 2, Johnson Controls has provided additional details to support the price schedules. These supporting documents and the price schedules they support are as follows:

- Schedule H-2:
 - Cost Breakdown sheets for each ECSM
 - Johnson Controls Direct Costs for the ECSMs associated with this proposal
- Schedule H-3:
 - Progress Payment Schedule
 - Sum of Construction Period Payments
 - Performance Period Payment Detail
 - Performance Period Expense Detail
 - Performance Expenses Support
 - Summary of Project 2 and 3 Financing
 - Progress Payment Schedule—Summary

- Progress Payment Schedule—Project 3 Component
- Progress Payment Schedule—Project 2 Component
- Effect of Cash Contribution on Construction Loan Draw Down
- Calculation of Project 2 and Project 3 Interest During Construction Charges
- Performance Period Payment Detail—Debt Service Component
- Performance Period Payment Detail—Expense Service Component
- Annual Energy Savings Support Calculation
- Individual ECSM Monthly Escalation Savings Detail

The significant financial elements of this Price Proposal include:

- Total Investment: \$75,678,746, including implementation period interest comprised of:
 - Implementation Price: \$67,166,280 (includes the Task Order 2 implementation price of 16,158,073).
 - Less Implementation Period Payments per the Progress Payment Schedule of \$22,477,012, which is comprised of \$11,539,953 for EJP2 and \$10,937,057 for EJP3.
 - Plus Financing Procurement Cost: \$8,512,465 (net of implementation period interest and escrowed savings). This includes \$2,059,674 of net IDC for Task Order 2 and \$6,452,791.87 of net IDC for the ECSMs included in this proposal.
- Interest Rate: 7.44% for Task Order 2 and 7.06% (effective rate: 7.29%) for the ECSMs included in this proposal. The latter rate is fixed to Task Order 2 modification. This fixed rate is valid until September 30, 2002.
- Estimated Annual Cost Savings: \$6,966,784. This is comprised of \$5,884,664 for Task Order 2 and \$1,082,120 for ECSMs included in this proposal.
- Estimated Energy related O&M Annual Savings: –\$3,106 for Task Order 2.
- Guaranteed First Year Energy and Energy-Related O&M Cost Savings: \$6,495,997.11
- Implementation Period Savings: \$491,456 for Project 3 components as determined from the project implementation schedule and detailed in the Progress Payment Schedule. These savings are based on individual Acceptance of ECSMs and of the performance of all ECSMs after Project Acceptance and prior to the start of payments. These savings are calculated based on individual ECSM monthly escalation and the Project Schedule and are to be paid per the Progress Payment Schedule.
- Assumed Project Award Date: September 30, 2002
- Project Closeout/Acceptance Completed: December 1, 2004
- Invoice to Government for First Contractor Payment: January 1, 2005.
- Total implementation period is 39 months starting from the date of Award of Task Order 2.
- Contractor Payments: Quarterly in Arrears for the Project 2 component during the Implementation Period. Quarterly in Advance for Project 3 during the Implementation Period and Annual in Advance for Projects 2 and 3 during the Performance Phase. Compounding is monthly.

- Annual Energy Cost Escalation is per the Annual Energy Savings Support Calculation with the amortization based upon the Individual ECSM Monthly Escalation Savings Detail.
- Annual Service and O&M Cost Escalation: 3.49% for Task Order 2 and 3.46% for the ECSMs included in this proposal.

APPROACH TO ESCALATION

For the cost escalation associated with Task Order 2, a 3.49% escalation factor is applied as was agreed. For the ECSMs included in this proposal a 3.46% escalation factor is applied to the annual costs during the service phase of the project. This forecast for cost escalation is based on the anticipated trend for general inflation over the contract term and is based on data from the Bureau of Labor Statistics.

The escalation for energy and ancillary cost savings is a conservative factor calculated individually for electricity, natural gas, and O&M at the anticipated average cost escalation. The energy data presented in the Government's publication, reference number NISTIR 85-3273-17 (rev. 4/02), entitled Energy Price Indices and Discount Factors for Life-Cycle Cost Analysis - April 2002 is the basis for energy escalation. Johnson Controls used this simplified approach in applying escalation to its future year cost savings. Hence, Johnson Controls proposes escalation of the cost savings to be stipulated over the term of the contract.

TITLE

Title to the Johnson Controls installed equipment and improvements furnished under this Task Order shall pass to the Government upon acceptance of the installation as complete. Johnson Controls will remain responsible for all performance requirements specified in the Task Order including repairs, operations and maintenance of the installed equipment, as described within this proposal. The financier of the installed energy conservation measures may retain a security interest in the equipment and improvements, subject to and subordinate to the rights of the Government.

In no event shall such security interest allow unlimited access to MAGTFTC Twentynine Palms for the purpose of disabling or removing any equipment or systems without written permission from the MAGTFTC Twentynine Palms Contracting Officer. Johnson Controls may be required to assign to the financing source its rights and responsibilities under this Task Order including rights to payments by the Government in the event of default by Johnson Controls.

TERMS OF PROJECT ACCEPTANCE

Johnson Controls proposes the Government accept this project in its entirety with the conclusion of the Proof of Performance of the last ECSM completed as part of the scope of this Proposal. The Government will accept ECSMs individually as they are completed. Acceptance of the individual ECSMs and of the project shall be granted in advance of receiving the required operational and maintenance manuals, Government training and as-built drawings. These items are to be provided by Johnson Controls after Project Acceptance.

SCHEDULE H-1 -- DELIVERY ORDER
Proposed Guaranteed Performance and Annual Contractor Payments

The Contractor shall complete the following statement:

If selected the Contractor shall complete the installation of all proposed ECSM's not later than 39 months from the date of the EJP2 task order modification award.

Project Site:	Delivery Order No.:		Contractor Name:	
MAGTFTC Twentynine Palms	EJP3		Johnson Controls, Government Systems LLC	
Performance Period Year	(a) Estimated Annual Cost Savings \$	(b) Proposed Guaranteed Annual Cost Savings \$	(c) Total Annual Contractor Payments \$	(d) Govt Share of Guaranteed Savings (b) - (c) \$
Implementation Period - EJP2		\$ 11,539,953	\$ 11,539,953	
Implementation Period - EJP3		\$ 10,937,059	\$ 10,937,059	
ONE	\$ 7,262,934.00	\$ 6,465,997.11	\$ 6,465,996	\$ 1
TWO	\$ 7,404,830.00	\$ 6,592,323.91	\$ 6,592,323	\$ 1
THREE	\$ 7,549,119.00	\$ 6,720,780.59	\$ 6,720,780	\$ 1
FOUR	\$ 7,695,825.00	\$ 6,851,388.85	\$ 6,851,388	\$ 1
FIVE	\$ 7,844,971.00	\$ 6,984,169.89	\$ 6,984,169	\$ 1
SIX	\$ 7,996,581.00	\$ 7,119,144.39	\$ 7,119,143	\$ 1
SEVEN	\$ 8,150,678.00	\$ 7,256,332.49	\$ 7,256,331	\$ 1
EIGHT	\$ 8,307,283.00	\$ 7,395,753.68	\$ 7,395,753	\$ 1
NINE	\$ 8,466,417.00	\$ 7,537,426.81	\$ 7,537,426	\$ 1
TEN	\$ 8,628,102.00	\$ 7,681,369.97	\$ 7,681,369	\$ 1
ELEVEN	\$ 8,792,355.00	\$ 7,827,600.50	\$ 7,827,600	\$ 1
TWELVE	\$ 8,959,196.00	\$ 7,976,134.88	\$ 7,976,134	\$ 1
THIRTEEN	\$ 9,128,643.00	\$ 8,126,988.68	\$ 8,126,988	\$ 1
FOURTEEN	\$ 9,300,711.00	\$ 8,280,176.49	\$ 8,280,175	\$ 1
FIFTEEN	\$ 9,475,416.00	\$ 8,435,711.87	\$ 8,435,711	\$ 1
SIXTEEN	\$ 9,652,772.00	\$ 8,593,607.24	\$ 8,593,606	\$ 1
SEVENTEEN	\$ 9,832,792.00	\$ 8,753,873.83	\$ 8,753,873	\$ 1
EIGHTEEN	\$ 10,015,485.00	\$ 8,916,520.60	\$ 8,916,307	\$ 214
TOTALS	\$ 154,464,110.00	\$ 159,992,314.15	\$ 159,992,084	\$ 230
<p>(a) The technical proposal and Schedule H-4 supports this estimate of annual cost savings as "REASONABLE."</p> <p>(b) The "PROPOSED GUARANTEED ANNUAL COST SAVINGS" is based on achieving contractors guaranteed performance per site-specific M&V Plan agreed to in task order.</p> <p>(c) The contractor payment represent the deliver order price and should be supported by information submitted in Schedules H-2 and H-3.</p> <p>(d) Annual Cost Savings are escalated per DOE Indices as shown in the Annual Energy Savings Support Calculation.</p> <p>(e) See table notes on Schedule H-3 for details of Implementation Periods savings and payments.</p> <p>(f) Implementation Period Payments are supported by savings documented in the Progress Payment Schedule for Project 2.</p> <p>(g) Above values are rounded to the nearest cent.</p>				

SCHEDULE H-2 -- DELIVERY ORDER

Implementation Price by ECSM, Technology Category, and Delivery Order

Note: Use a separate page for ECSMs in the same technology category. Provide Delivery Order Total on the last page.

Project Site:			Delivery Order No.:		Contractor Name:		
MAGTFTC Twentynine Palms			EJP3		Johnson Controls, Government Systems LLC		
Tech No.	ECSM No.	ECSM Description Title	(a) Survey, Feasibility & Design Expense (\$)	(b) Construction Expense (\$)	(c)=(a)+(b) Total Implementation Expense (\$)	(d) Implementation Margin (Not to Exceed B-1) (%)	(e) = (c) x (1+d/100) Implementation Price (\$)
16		Project Direct Costs	\$ 400,396	\$ 2,790,979	\$ 3,191,375	33%	\$ 4,244,529
7	1	Air Conditioning System Upgrade		\$ 23,030,682	\$ 23,030,682	33%	\$ 30,630,807
3	2	Energy Management Control System Upgrade		\$ 4,149,785	\$ 4,149,785	35%	\$ 5,602,210
6	3	1 MW AC Photovoltaic System		\$ 8,417,293	\$ 8,417,293	30%	\$ 10,942,481
4	4	Skylights and Daylighting Control		\$ 552,240	\$ 552,240	25%	\$ 690,300
		Less Contractor Price Concession			\$ -		\$ (1,102,120)
Totals for Project 3 ECSMs					\$ 39,341,375		\$ 51,008,207
					\$ -		
10	10.1	Cogeneration System (Task Order 2 Project)	\$ 966,563	\$ 11,706,435	\$ 12,672,998	28%	\$ 16,221,438
		Pricing Adjustment for Johnson Controls Components			\$ -		\$ (63,365)
Total Implementation Price					\$ -		\$ 67,166,280
Net Price to Government							\$ 67,166,280

SCHEDULE H-3 -- DELIVERY ORDER
Contractor Cash Flow

Note: Add columns to Schedule H-3 so that all years in the performance period are shown.

Project Site:	Delivery Order No.:		Contractor Name:										
MAGFTC Twentynine Palms	EJP3		Johnson Controls, Government Systems LLC										
		Implementation Period - EJP2	Implementation Period - EJP3	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
AMOUNT FINANCED													
Implementation Price (H-2, col. e, DO total) (\$)	\$67,166,280												
Financing Procurement Price (\$)	\$(8,512,466)												
Total Amount Financed (\$)	\$75,678,746												
ANNUAL CASH FLOW (PERFORMANCE PERIOD)													
Debt Service:													
Interest (\$)		\$ 1,471,129		\$ 317,743	\$3,825,209	\$3,737,840	\$3,638,452	\$3,538,131	\$3,350,457	\$3,206,887	\$3,054,343	\$2,885,463	\$2,700,577
Principal Payment (\$)		\$ 8,923,341	\$ 10,937,059	\$4,541,189	\$1,104,266	\$1,260,985	\$1,445,696	\$1,617,436	\$1,876,594	\$2,091,654	\$2,315,642	\$2,535,127	\$2,811,908
(a) Total Debt Service (\$)		\$ 10,394,470	\$ 10,937,059	\$4,858,933	\$4,929,475	\$4,998,826	\$5,084,148	\$5,155,567	\$5,227,051	\$5,298,541	\$5,369,985	\$5,420,591	\$5,512,484
Penalty if Debt is Retired at Year End (\$)													
Performance Period Expenses:													
Management/Administration (\$)		\$ -		\$ 18,275	\$ 18,907	\$ 19,561	\$ 20,238	\$ 20,938	\$ 21,662	\$ 22,412	\$ 23,187	\$ 23,989	\$ 24,819
Operation (\$)		\$ 209,634		\$ 27,501	\$ 28,461	\$ 29,454	\$ 30,482	\$ 31,545	\$ 32,646	\$ 33,786	\$ 34,965	\$ 36,185	\$ 37,448
Maintenance (\$)		\$ -		\$ 429,304	\$ 444,158	\$ 459,526	\$ 475,426	\$ 491,876	\$ 508,895	\$ 526,503	\$ 544,720	\$ 563,567	\$ 583,066
Repair and Replacement (\$)		\$ 635,807		\$ 685,771	\$ 709,622	\$ 734,307	\$ 759,856	\$ 786,294	\$ 813,651	\$ 841,961	\$ 871,255	\$ 901,569	\$ 932,937
Measurement and Verification (\$)		\$ 52,977		\$ 68,369	\$ 70,745	\$ 73,204	\$ 63,810	\$ 66,030	\$ 68,328	\$ 70,705	\$ 73,165	\$ 91,297	\$ 78,344
Permits and Licenses (\$)				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Insurance (\$)				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Property Taxes (\$)				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other (Describe & Itemize on Attachment) (\$)				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
(b) Subtotal Performance Period Expenses (\$)		\$ 898,418		\$1,229,220	\$1,271,892	\$1,316,052	\$1,349,812	\$1,396,684	\$1,445,182	\$1,495,366	\$1,547,292	\$1,616,606	\$1,656,614
(c) Margin (Not to Exceed B-2) (%)		27.5%		30.7%	30.7%	30.8%	30.9%	30.9%	30.9%	30.9%	30.9%	30.9%	30.9%
(d) Performance Period Prices ((d)=(b) x (1+c/100))		\$ 1,145,483		\$1,607,063	\$1,662,848	\$1,721,954	\$1,767,240	\$1,828,601	\$1,892,093	\$1,957,790	\$2,025,768	\$2,116,835	\$2,168,885
(e) Total Annual Contractor Payment (e)=(a)+(d)		\$ 11,539,953	\$ 10,937,059	\$6,465,996	\$6,592,323	\$6,720,780	\$6,851,388	\$6,984,169	\$7,119,143	\$7,256,331	\$7,395,753	\$7,537,426	\$7,681,369
Submit the following as applicable to above debt service: Total Annual Interest Rate: 7.44% for Project 2 and 7.06% (effective rate 7.29%) for Project 3 Component (not to exceed B-3 plus T-Bill/T-Note reference) T-Bill/T-Note Reference: Term Like term Treasury rate swap; Issue Date 11/23/2001 (Project 2) and 9/24/02 (Project 3); Interest Rate 5.64% for Project 2 and 5.02% for Project 3. Source: Federal Reserve Board Statistical Release H.15 (e.g. Wall Street Journal, web site)													

SCHEDULE H-3 -- DELIVERY ORDER
Contractor Cash Flow

Note: Add columns to Schedule H-3 so that all years in the performance period are shown.

Project Site:	Delivery Order No.:	Contractor Name:							
MAGTFC Twentynine Palms	ELP3	Johnson Controls, Government Systems LLC							
		Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18
AMOUNT FINANCED									
Implementation Price (H-2, col. e, DO total) (\$)	\$67,166,280								
Financing Procurement Price (\$)	\$(8,512,466)								
Total Amount Financed (\$)	\$75,678,746								
ANNUAL CASH FLOW (PERFORMANCE PERIOD)									
Debt Service:									Totals
Interest (\$)		\$2,495,504	\$2,270,304	\$2,023,530	\$1,755,369	\$1,460,832	\$1,139,766	\$ 790,284	\$ 412,352
Principal Payment (\$)		\$3,087,903	\$3,383,714	\$3,676,963	\$4,038,637	\$4,402,387	\$4,792,026	\$5,182,137	\$5,654,084
(a) Total Debt Service (\$)		\$5,583,407	\$5,654,018	\$5,700,493	\$5,794,006	\$5,863,219	\$5,931,792	\$5,972,421	\$6,066,436
Penalty if debt is retired at yearend (\$)									\$ -
Performance Period Expenses:									
Management/Administration (\$)		\$ 25,678	\$ 26,566	\$ 27,485	\$ 28,436	\$ 29,420	\$ 30,438	\$ 31,491	\$ 32,581
Operation (\$)		\$ 38,755	\$ 40,107	\$ 41,507	\$ 42,956	\$ 44,455	\$ 46,006	\$ 47,612	\$ 49,274
Maintenance (\$)		\$ 603,240	\$ 624,112	\$ 645,706	\$ 668,047	\$ 691,161	\$ 715,075	\$ 739,817	\$ 765,415
Repair and Replacement (\$)		\$ 965,397	\$ 998,987	\$1,033,744	\$1,069,712	\$1,106,930	\$1,145,444	\$1,185,297	\$1,226,537
Measurement and Verification (\$)		\$ 81,070	\$ 83,891	\$ 104,668	\$ 89,829	\$ 92,954	\$ 96,188	\$ 119,997	\$ 102,998
Permits and Licenses (\$)		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Insurance (\$)		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Property Taxes (\$)		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other (describe & itemize on attachment) (\$)		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
(b) Subtotal Performance Period Expenses (\$)		\$1,714,140	\$1,773,663	\$1,853,110	\$1,898,979	\$1,964,920	\$2,033,151	\$2,124,214	\$2,176,805
(c) Margin (not the exceed B-2) (%)		30.9%	30.9%	30.9%	30.9%	30.9%	30.9%	30.9%	30.9%
(d) Performance Period Prices ((d)=(b) x (1+c/100))		\$2,244,193	\$2,322,116	\$2,426,494	\$2,486,169	\$2,572,492	\$2,661,814	\$2,781,452	\$2,849,872
(e) Total Annual Contractor Payment (e)=(a)+(d)		\$7,827,600	\$7,976,134	\$8,126,988	\$8,280,175	\$8,435,711	\$8,593,606	\$8,753,873	\$8,916,307
									\$159,992,084

Notes:

- 1 Project finance rate for Project 3 components to be fixed to Award date. Project 3 rate is valid until 9/30/02. Project 2 components were fixed at its 10/2001 Award.
- 2 Total Annual Contractor Payments are Annual in advance during Performance Period and Quarterly payments in arrears for Project 2 during Implementation period. Compounding is monthly.
- 3 Annual Payments during the Performance term for the Project 2 components are calculated separately and are net of escrowed funds yielding 1.5% interest per year.
- 4 Finance procurement price is net of escrowed construction loans reinvestments and is the sum of Project 2 and Project 3 components. See Construction Draw Schedules for details.
- 5 Contract term is 243 months based on the 10/01/01 Award of Project 2 (Cogeneration) and last payment made is due on 01/01/22.
- 6 Construction Period is 39 months from start of Project 2 until Acceptance of Project 3.
- 7 Implementation Period Principal Payment of \$9,911,536 is from payments made after Acceptance of Project 2 and during construction of Project 3, determined as follows:

\$ <u> </u>	for funds paid from Project 3 Award and applied to Project 2 of the amount and timing of as agreed in Project 2 Award.
plus \$ 8,923,341	for principal paid during construction of Project 2
Total: \$ 8,923,341	

- 8 Implementation Period Payments are supported by the following savings from Cogeneration ECSM (Project 2) operations determined as follows:

\$ 11,539,955	of construction period savings for Cogeneration ECSM (assumes Acceptance of ECSM per Award 10/2001)
plus \$ <u> </u>	for funds paid from Project 3 Award and applied to Project 2 of the amount and timing as agreed in Project 2 Award.
Total: \$ 11,539,955	

- 9 Difference between Implementation Period Savings and Implementation Period Principal Payment is:

\$ 11,539,955	from 8.
less \$ 8,923,341	from 7.
Total: \$ 2,616,614	

- 10 The above total is used to pay Construction Period Operating Expenses of Cogeneration ECSM and Interest during the Construction Period which are:

\$ 1,145,483	Construction Period Operating Expenses
plus \$ 1,471,129	Interest on Cogeneration ECSM Debt during Construction Period.
Total: \$ 2,616,612	

- 11 Excess Savings = \$2.07. Difference due to roundoff.
- 12 Implementation Period Payments of \$11,539,952.93 details are provided in the Progress Payment Schedule for Project 2.
- 13 Additional Implementation Period Payments of \$10,937,059.37 are used to reduce the Total Amount Financed which reduces interest during construction.
These Payments are to be made by the Government to Johnson Controls in the amounts and timing provided on the attached payment schedule.
The nature of these payments are as follows:

\$ 4,500,000	from Project 3. Paid directly to JCI (not an Government Obligation under this delivery order) at Acceptance of ECSM.
plus \$ 274,000	from Cash Contribution for Building 1738 Project.
plus \$ 520,601	from Other Cash Contributions.
plus \$ 50,000	from DOE / FEMP Grant.
plus \$ 5,101,000	Application of Project 2 Navy Energy Program Funds
plus \$ 491,458	from Construction Period Savings created with the Acceptance of each ECSM prior to Project Acceptance.
Total: \$ 10,937,059	

SCHEDULE H-4 -- DELIVERY ORDER**Energy and Cost Savings by ECSM, Technology Category, and Delivery Order**

Note: Use a separate page for ECSMs in the same technology category. Provide Task Order Total on the last page.

Project Site:		Delivery Order No. :				Contractor Name :			
MAGTFTC Twentynine Palms		EJP3				Johnson Controls, Government Systems LLC			
		(a1) Electricity (\$/kWh)		(b1) Natural Gas (\$/therm)		(c1) Other _____ (\$/_____)		(d1) Other _____ (\$/_____)	
Baseline Energy Prices (provide supporting a attachments)									
		(a) Electricity Savings (kWh/yr)	(b) Natural Gas Savings (therms/yr)	(c) Other_____ Savings (_____)	(d) Other_____ Savings (_____)	(e) = (a1)(a) + (b1)(b) + etc. Estimated Total Energy Cost Savings (\$/yr)	(f) Estimated Recurring Ancillary Cost Savings* (\$/yr)	(g) = (e) + (f) Estimated Total Recurring Cost Savings (\$/yr)	(g) = (e) + (f) Estimated Simple Payback (yr)
Tech No.	ECM No.								
7	1	2,747,319	(95,563)	-	-	\$ 433,497	\$ -	\$ 433,497	53.13
3	2	1,376,666	91,841	-	-	\$ 197,025	\$ -	\$ 197,025	21.06
6	3	2,319,650	-	-	-	\$ 392,518	\$ -	\$ 392,518	9.98
4	4	330,494	(451)	-	-	\$ 59,080		\$ 59,080	9.35
10	10.1	56,401,746	(337,321)	(3,889)	-	\$ 5,884,664	\$ (3,106)	\$ 5,881,558	2.76
Technology Category Subtotal									
Task Order Total (last page only)		63,175,875	(341,494)	(3,889)	-	6,966,784	(3,106)	6,963,678	8.07

* One-time ancillary cost savings are listed in column (f) with an asterisk, and are not included in column or row totals with annually recurring energy and ancillary cost savings.

All other entries in the one-time ancillary cost row are zero.

Note: 1kWh = 3,414 Btus

rate tariff is applied for electricity (non-generation commodity charges, published demand charges) and understood negotiated flat rate of 0.11273 for commodity supplied by Strategic Energy.

Simple Payback - Sch. H-2 Installation Price divided by Total Savings

(a) Annual Cost Savings are escalated per DOE Indices as shown in the Annual Energy Savings Support Calculation.

(b) See table notes on Schedule H-3 for details of Year 1 savings and payments.

SCHEDULE H-5 DELIVERY ORDER
Guaranteed Savings, Price, and Cancellation Ceiling

The Contractor shall complete the following statement:

If selected the Contractor shall complete the installation of all proposed ECSM's not later than 39 months from the date of the EJP3 task order modification award.

Project Site:	Delivery Order No. :		Contractor Name:
MAGTFTC Twentynine Palms	EJP3		Johnson Controls, Government Systems LLC
Performance Period Year	(a) Detailed Energy Survey Guaranteed Annual Cost Savings \$	(b) Total Annual Contractor Payments \$	(c) Cancellation Ceiling \$
ONE	\$ 6,465,997	\$ 6,465,996	\$ 58,078,889
TWO	\$ 6,592,324	\$ 6,592,323	\$ 56,824,010
THREE	\$ 6,720,781	\$ 6,720,780	\$ 55,391,413
FOUR	\$ 6,851,389	\$ 6,851,388	\$ 53,749,403
FIVE	\$ 6,984,170	\$ 6,984,169	\$ 51,846,159
SIX	\$ 7,119,144	\$ 7,119,143	\$ 49,717,309
SEVEN	\$ 7,256,332	\$ 7,256,331	\$ 47,352,373
EIGHT	\$ 7,395,754	\$ 7,395,753	\$ 44,734,183
NINE	\$ 7,537,427	\$ 7,537,426	\$ 41,867,832
TEN	\$ 7,681,370	\$ 7,681,369	\$ 38,688,538
ELEVEN	\$ 7,827,601	\$ 7,827,600	\$ 35,197,190
TWELVE	\$ 7,976,135	\$ 7,976,134	\$ 31,371,381
THIRTEEN	\$ 8,126,989	\$ 8,126,988	\$ 27,214,009
FOURTEEN	\$ 8,280,176	\$ 8,280,175	\$ 22,647,709
FIFTEEN	\$ 8,435,712	\$ 8,435,711	\$ 17,670,134
SIXTEEN	\$ 8,593,607	\$ 8,593,606	\$ 12,252,013
SEVENTEEN	\$ 8,753,874	\$ 8,753,873	\$ 6,392,811
EIGHTEEN	\$ 8,916,521	\$ 8,916,307	\$ -
TOTAL	\$ 137,515,302	\$ 137,515,072	
<p>(a) The "GUARANTEED ANNUAL COST SAVINGS" is based on achieving annual cost savings per site-specific M&V plan agreed to in Task Order.</p> <p>(b) This contractor payment represents the delivery order price and should be supported by information submitted in Schedules H-2 and H-3.</p> <p>(c) State cancellation ceilings for the end of each year (e.g. "ONE" means end of one year after Government acceptance).</p> <p>(d) Cancellation ceilings are rounded to the nearest whole dollar.</p> <p>(e) Cancellation ceilings are calculated based upon the outstanding balance of the individual Project 2 and Project 3 components that make up this task order.</p>			

Construction Period Progress Payment Schedule

Period	Payment Due Date	Total Due to Johnson Controls	Due to Johnson Controls from DOD/DON	Due to Johnson Controls from 29 Palms MAGTFTC	Due to Johnson Controls from Other Parties
1	10/1/01				
2	11/1/01	\$0.00	\$0.00	\$0.00	\$0.00
3	12/1/01	\$0.00	\$0.00	\$0.00	\$0.00
4	1/1/02	\$0.00	\$0.00	\$0.00	\$0.00
5	2/1/02	\$0.00	\$0.00	\$0.00	\$0.00
6	3/1/02	\$0.00	\$0.00	\$0.00	\$0.00
7	4/1/02	\$0.00	\$0.00	\$0.00	\$0.00
8	5/1/02	\$0.00	\$0.00	\$0.00	\$0.00
9	6/1/02	\$0.00	\$0.00	\$0.00	\$0.00
10	7/1/02	\$0.00	\$0.00	\$0.00	\$0.00
11	8/1/02	\$0.00	\$0.00	\$0.00	\$0.00
12	9/1/02	\$0.00	\$0.00	\$0.00	\$0.00
13	10/1/02	\$4,149,526.68	\$4,149,526.68	\$0.00	\$0.00
14	11/1/02	\$0.00	\$0.00	\$0.00	\$0.00
15	12/1/02	\$1,862,118.09	\$1,862,118.09	\$0.00	\$0.00
16	1/1/03	\$0.00	\$0.00	\$0.00	\$0.00
17	2/1/03	\$0.00	\$0.00	\$0.00	\$0.00
18	3/1/03	\$644,031.22	\$644,031.22	\$0.00	\$0.00
19	4/1/03	\$0.00	\$0.00	\$0.00	\$0.00
20	5/1/03	\$0.00	\$0.00	\$0.00	\$0.00
21	6/1/03	\$390,405.54	\$390,405.54	\$0.00	\$0.00
22	7/1/03	\$0.00	\$0.00	\$0.00	\$0.00
23	8/1/03	\$0.00	\$0.00	\$0.00	\$0.00
24	9/1/03	\$6,511,622.30	\$609,909.25	\$1,401,713.05	\$4,500,000.00
25	10/1/03	\$0.00	\$0.00	\$0.00	\$0.00
26	11/1/03	\$0.00	\$0.00	\$0.00	\$0.00
27	12/1/03	\$1,402,776.33	\$0.00	\$1,402,776.33	\$0.00
28	1/1/04	\$0.00	\$0.00	\$0.00	\$0.00
29	2/1/04	\$0.00	\$0.00	\$0.00	\$0.00
30	3/1/04	\$3,309,918.18	\$1,062,009.22	\$2,247,908.96	\$0.00
31	4/1/04	\$0.00	\$0.00	\$0.00	\$0.00
32	5/1/04	\$0.00	\$0.00	\$0.00	\$0.00
33	6/1/04	\$1,403,307.96	\$0.00	\$1,403,307.96	\$0.00
34	7/1/04	\$0.00	\$0.00	\$0.00	\$0.00
35	8/1/04	\$0.00	\$0.00	\$0.00	\$0.00
36	9/1/04	\$1,403,308.02	\$0.00	\$1,403,308.02	\$0.00
37	10/1/04	\$0.00	\$0.00	\$0.00	\$0.00
38	11/1/04	\$0.00	\$0.00	\$0.00	\$0.00
	12/1/04	\$1,399,995.90	\$0.00	\$1,399,995.90	\$0.00
Totals		\$22,477,010.22	\$8,718,000.00	\$9,259,010.22	\$4,500,000.00

Note: See Construction Period Payment Schedules for Project 2 and 3 for details.

Construction Period Payment Schedule - Project 3

Period	Payment Due Date	Total Due to Johnson Controls	Due to Johnson Controls from DOD/DON	Due to Johnson Controls from 29 Palms MAGFTC	Due to Johnson Controls from Other Parties	ECSM 1	ECSM 2	ECSM 3	ECSM 4	Percent of Completion Payments	Description of Payment	Source of Funds	Purpose of Cash Payment
1	10/1/01												
2	11/1/01	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
3	12/1/01	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
4	1/1/02	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
5	2/1/02	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
6	3/1/02	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
7	4/1/02	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
8	5/1/02	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
9	6/1/02	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
10	7/1/02	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
11	8/1/02	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
12	9/1/02	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
13	10/1/02	\$532,526.68	\$ 532,526.68	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$ 532,526.68	Project II Buydown & Project Development Costs	DOD/DON	Reduction in Project III Interest During Construction
14	11/1/02	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
15	12/1/02	\$1,862,118.09	\$1,862,118.09	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1,862,118.09	Design Submittal 1400/1600/1800 Plant Designs & Photovoltaic Design Submittal, Design Submittal Daylighting	DOD/DON	Reduction in Project III Interest During Construction
16	1/1/03	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
17	2/1/03	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
18	3/1/03	\$644,031.22	\$644,031.22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$644,031.22	Design Submittal 1400/1600 Piping Distribution	DOD/DON	Reduction in Project III Interest During Construction
19	4/1/03	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
20	5/1/03	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
21	6/1/03	\$390,405.54	\$390,405.54	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$390,405.54	Design Submittal 1800 Piping Distribution and 1400/1600 Block Building Design Submittals	DOD/DON	Reduction in Project III Interest During Construction
22	7/1/03	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
23	8/1/03	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
24	9/1/03	\$5,191,130.16	\$609,909.25	\$81,220.91	\$ 4,500,000.00	\$0.00	\$0.00	\$66,160.16	\$15,060.75	\$5,109,909.25	Self Generation Incentive - PV Array, Design Submittal 1800 Block Buildings & Design Submittal EMCS Hardware Eng	PV Array - CEC, Design Submittals - DOD/DON, Energy Savings - 29 Palms	Reduction in Project III Interest During Construction
25	10/1/03	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
26	11/1/03	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
27	12/1/03	\$82,284.19	\$0.00	\$82,284.19	\$0.00	\$0.00	\$0.00	\$67,026.28	\$15,257.91	\$0.00	Energy and Related Savings	29 Palms	
28	1/1/04	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
29	2/1/04	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
30	3/1/04	\$1,989,426.05	\$ 1,062,009.22	\$927,416.83	\$0.00	\$0.00	\$0.00	\$67,459.33	\$15,356.50	\$1,906,610.22	Design Submittal - DOD/DON, Energy Savings - 29 Palms, Any outstanding cash contribution commitments from 29 Palms are applied here.	1400, 1600, 1800 Plant Commissioned	Reduction in Project III Interest During Construction
31	4/1/04	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
32	5/1/04	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
33	6/1/04	\$82,815.83	\$0.00	\$82,815.83	\$0.00	\$0.00	\$0.00	\$67,459.33	\$15,356.50	\$0.00	Energy and Related Savings	29 Palms	Reduction in Project III Interest During Construction
34	7/1/04	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
35	8/1/04	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
36	9/1/04	\$82,815.83	\$0.00	\$82,815.83	\$0.00	\$0.00	\$0.00	\$67,459.33	\$15,356.50	\$0.00	Energy and Related Savings	29 Palms	Reduction in Project III Interest During Construction
37	10/1/04	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
38	11/1/04	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
39	12/1/04	\$79,503.71	\$0.00	\$79,503.71	\$0.00	\$35,681.25	\$16,217.18	\$22,486.44	\$5,118.83	\$0.00	Energy and Related Savings	Energy Savings - 29 Palms	Reduction in Project III Interest During Construction
Totals		\$10,937,057.30	\$5,101,000.00	\$1,336,057.30	\$4,500,000.00	\$35,681.25	\$16,217.18	\$358,050.89	\$81,506.98	\$10,445,601.00			

Note: ECSM Related Savings for Period 38 are for 1 month only. All previous savings values are for the sum of the three months beginning with the listed amount.

Construction Period Payment Schedule - Project 2

Period	Payment Due Date	Total Due to Johnson Controls	Due to Johnson Controls from DOD/DON	Due to Johnson Controls from 29 Palms MAGTFTC	Cogeneration Project II	Description of Payment	Source of Funds	Purpose of Cash Payment
1	10/1/01							
2	11/1/01	\$0.00	\$0.00	\$0.00	\$0.00			
3	12/1/01	\$0.00	\$0.00	\$0.00	\$0.00			
4	1/1/02	\$0.00	\$0.00	\$0.00	\$0.00			
5	2/1/02	\$0.00	\$0.00	\$0.00	\$0.00			
6	3/1/02	\$0.00	\$0.00	\$0.00	\$0.00			
7	4/1/02	\$0.00	\$0.00	\$0.00	\$0.00			
8	5/1/02	\$0.00	\$0.00	\$0.00	\$0.00			
9	6/1/02	\$0.00	\$0.00	\$0.00	\$0.00			
10	7/1/02	\$0.00	\$0.00	\$0.00	\$0.00			
11	8/1/02	\$0.00	\$0.00	\$0.00	\$0.00			
12	9/1/02	\$0.00	\$0.00	\$0.00	\$0.00			
13	10/1/02	\$3,617,000.00	\$3,617,000.00	\$0.00	\$3,617,000.00	Project II Incentive	Project II - EJP2 Incentive Funds DOD/DON	Reduction in Project III Interest During Construction
14	11/1/02	\$0.00	\$0.00	\$0.00	\$0.00			
15	12/1/02	\$0.00	\$0.00	\$0.00	\$0.00			
16	1/1/03	\$0.00	\$0.00	\$0.00	\$0.00			
17	2/1/03	\$0.00	\$0.00	\$0.00	\$0.00			
18	3/1/03	\$0.00	\$0.00	\$0.00	\$0.00			
19	4/1/03	\$0.00	\$0.00	\$0.00	\$0.00			
20	5/1/03	\$0.00	\$0.00	\$0.00	\$0.00			
21	6/1/03	\$0.00	\$0.00	\$0.00	\$0.00			
22	7/1/03	\$0.00	\$0.00	\$0.00	\$0.00			
23	8/1/03	\$0.00	\$0.00	\$0.00	\$0.00			
24	9/1/03	\$1,320,492.14	\$0.00	\$1,320,492.14	\$1,320,492.14	Per EJP2 Contract less Project II Incentives	Energy and Related Savings	Debt Service and Johnson Controls Cogeneration Plant Operating Expenses
25	10/1/03	\$0.00	\$0.00	\$0.00	\$0.00			
26	11/1/03	\$0.00	\$0.00	\$0.00	\$0.00			
27	12/1/03	\$1,320,492.14	\$0.00	\$1,320,492.14	\$1,320,492.14	Per EJP2 Contract	Energy and Related Savings	Debt Service and Johnson Controls Cogeneration Plant Operating Expenses
28	1/1/04	\$0.00	\$0.00	\$0.00	\$0.00			
29	2/1/04	\$0.00	\$0.00	\$0.00	\$0.00			
30	3/1/04	\$1,320,492.14	\$0.00	\$1,320,492.14	\$1,320,492.14	Per EJP2 Contract	Energy and Related Savings	Debt Service and Johnson Controls Cogeneration Plant Operating Expenses
31	4/1/04	\$0.00	\$0.00	\$0.00	\$0.00			
32	5/1/04	\$0.00	\$0.00	\$0.00	\$0.00			
33	6/1/04	\$1,320,492.14	\$0.00	\$1,320,492.14	\$1,320,492.14	Per EJP2 Contract	Energy and Related Savings	Debt Service and Johnson Controls Cogeneration Plant Operating Expenses
34	7/1/04	\$0.00	\$0.00	\$0.00	\$0.00			
35	8/1/04	\$0.00	\$0.00	\$0.00	\$0.00			
36	9/1/04	\$1,320,492.19	\$0.00	\$1,320,492.19	\$1,320,492.19	Per EJP2 Contract	Energy and Related Savings	Debt Service and Johnson Controls Cogeneration Plant Operating Expenses
37	10/1/04	\$0.00	\$0.00	\$0.00	\$0.00			
38	11/1/04	\$0.00	\$0.00	\$0.00	\$0.00			
39	12/1/04	\$1,320,492.19	\$0.00	\$1,320,492.19	\$1,320,492.19	Per EJP2 Contract	Energy and Related Savings	Debt Service and Johnson Controls Cogeneration Plant Operating Expenses
Totals		\$11,539,952.93	\$3,617,000.00	\$7,922,952.93	\$11,539,952.93			

Performance Period Payment Schedule

Year	Period	Date	Total Payment Due to JCI from 29 Palms MAGTFTC	Project 2(mod) - Performance Period Payments				Combined Project 2, 3 Savings & Expense		
				Balance	Interest	Principal	Total Debt Service Payment	Savings, Net of Operating Expenses	Savings	Operating Expenses
1	39	1/1/05	\$6,465,996.11	\$53,099,258.19	\$317,743.48	\$2,719,089.48	\$4,858,932.74	\$405,831.59	\$538,833.01	\$133,001.42
1	40	2/1/05	\$0.00	\$53,414,427.97	\$315,169.78	(\$315,169.78)	\$0.00	\$405,831.57	\$538,833.01	\$133,001.44
1	41	3/1/05	\$0.00	\$53,731,469.17	\$317,041.20	(\$317,041.20)	\$0.00	\$405,831.57	\$538,833.01	\$133,001.44
1	42	4/1/05	\$0.00	\$53,443,026.31	\$318,923.73	\$288,442.86	\$0.00	\$405,831.57	\$538,833.01	\$133,001.44
1	43	5/1/05	\$0.00	\$53,760,078.09	\$317,051.78	(\$317,051.78)	\$0.00	\$405,831.57	\$538,833.01	\$133,001.44
1	44	6/1/05	\$0.00	\$54,079,011.48	\$318,933.39	(\$318,933.39)	\$0.00	\$405,831.57	\$538,833.01	\$133,001.44
1	45	7/1/05	\$0.00	\$53,792,471.07	\$320,826.18	\$286,540.41	\$0.00	\$403,990.55	\$538,833.01	\$134,842.46
1	46	8/1/05	\$0.00	\$54,111,435.61	\$318,964.54	(\$318,964.54)	\$0.00	\$403,990.55	\$538,833.01	\$134,842.46
1	47	9/1/05	\$0.00	\$54,432,292.13	\$320,856.52	(\$320,856.52)	\$0.00	\$403,990.55	\$538,833.01	\$134,842.46
1	48	10/1/05	\$0.00	\$54,147,685.28	\$322,759.74	\$284,606.86	\$0.00	\$403,990.55	\$538,833.01	\$134,842.46
1	49	11/1/05	\$0.00	\$54,468,593.84	\$320,908.57	(\$320,908.57)	\$0.00	\$403,990.55	\$538,833.01	\$134,842.46
1	50	12/1/05	\$0.00	\$54,791,404.93	\$322,811.09	(\$322,811.09)	\$0.00	\$403,990.55	\$538,833.01	\$134,842.46
2	51	1/1/06	\$6,592,322.91	\$52,014,868.45	\$310,962.56	\$2,776,536.48	\$4,929,474.92	\$411,742.20	\$549,360.24	\$549,360.24
2	52	2/1/06	\$0.00	\$52,323,079.70	\$308,211.25	(\$308,211.25)	\$0.00	\$411,742.20	\$549,360.24	\$549,360.24
2	53	3/1/06	\$0.00	\$52,633,117.84	\$310,038.14	(\$310,038.14)	\$0.00	\$411,742.20	\$549,360.24	\$137,618.05
2	54	4/1/06	\$0.00	\$52,333,194.14	\$311,875.86	\$299,923.70	\$0.00	\$411,742.20	\$549,360.24	\$137,618.05
2	55	5/1/06	\$0.00	\$52,643,125.47	\$309,931.32	(\$309,931.32)	\$0.00	\$411,742.20	\$549,360.24	\$137,618.05
2	56	6/1/06	\$0.00	\$52,954,892.85	\$311,767.39	(\$311,767.39)	\$0.00	\$411,742.20	\$549,360.24	\$137,618.05
2	57	7/1/06	\$0.00	\$52,654,515.22	\$313,614.33	\$300,377.63	\$0.00	\$409,836.96	\$549,360.24	\$139,523.29
2	58	8/1/06	\$0.00	\$52,966,180.69	\$311,665.47	(\$311,665.47)	\$0.00	\$409,836.96	\$549,360.24	\$139,523.29
2	59	9/1/06	\$0.00	\$53,279,691.46	\$313,510.77	(\$313,510.77)	\$0.00	\$409,836.96	\$549,360.24	\$139,523.29
2	60	10/1/06	\$0.00	\$52,978,874.08	\$315,366.99	\$300,817.37	\$0.00	\$409,836.96	\$549,360.24	\$139,523.29
2	61	11/1/06	\$0.00	\$53,292,287.95	\$313,413.87	(\$313,413.87)	\$0.00	\$409,836.96	\$549,360.24	\$139,523.29
2	62	12/1/06	\$0.00	\$53,607,556.41	\$315,268.46	(\$315,268.46)	\$0.00	\$409,836.96	\$549,360.24	\$139,523.29
3	63	1/1/07	\$6,720,779.59	\$50,780,132.28	\$303,176.41	\$2,827,424.13	\$4,998,825.58	\$417,669.93	\$560,064.97	\$142,395.04
3	64	2/1/07	\$0.00	\$51,080,446.60	\$300,314.33	(\$300,314.33)	\$0.00	\$417,669.93	\$560,064.97	\$142,395.04
3	65	3/1/07	\$0.00	\$51,382,537.44	\$302,090.83	(\$302,090.83)	\$0.00	\$417,669.93	\$560,064.97	\$142,395.04
3	66	4/1/07	\$0.00	\$51,065,785.13	\$303,877.85	\$316,752.31	\$0.00	\$417,669.93	\$560,064.97	\$142,395.04
3	67	5/1/07	\$0.00	\$51,367,612.66	\$301,827.54	(\$301,827.54)	\$0.00	\$417,669.93	\$560,064.97	\$142,395.04
3	68	6/1/07	\$0.00	\$51,671,224.58	\$303,611.91	(\$303,611.91)	\$0.00	\$417,669.93	\$560,064.97	\$142,395.04
3	69	7/1/07	\$0.00	\$51,353,889.73	\$305,406.84	\$317,334.84	\$0.00	\$415,467.67	\$560,064.97	\$144,597.30
3	70	8/1/07	\$0.00	\$51,657,241.11	\$303,351.38	(\$303,351.38)	\$0.00	\$415,467.67	\$560,064.97	\$144,597.30
3	71	9/1/07	\$0.00	\$51,962,384.77	\$305,143.65	(\$305,143.65)	\$0.00	\$415,467.67	\$560,064.97	\$144,597.30
3	72	10/1/07	\$0.00	\$51,644,478.09	\$306,946.52	\$317,906.67	\$0.00	\$415,467.67	\$560,064.97	\$144,597.30
3	73	11/1/07	\$0.00	\$51,949,364.05	\$304,885.96	(\$304,885.96)	\$0.00	\$415,467.67	\$560,064.97	\$144,597.30
3	74	12/1/07	\$0.00	\$52,256,050.22	\$306,686.18	(\$306,686.18)	\$0.00	\$415,467.67	\$560,064.97	\$144,597.30
4	75	1/1/08	\$6,851,387.85	\$49,364,682.26	\$294,309.36	\$2,891,367.96	\$5,084,148.04	\$424,703.86	\$570,948.99	\$146,245.13
4	76	2/1/08	\$0.00	\$49,655,976.26	\$291,294.00	(\$291,294.00)	\$0.00	\$424,703.86	\$570,948.99	\$146,245.13
4	77	3/1/08	\$0.00	\$49,948,989.40	\$293,013.14	(\$293,013.14)	\$0.00	\$424,703.86	\$570,948.99	\$146,245.13
4	78	4/1/08	\$0.00	\$49,613,603.19	\$294,742.43	\$335,386.21	\$0.00	\$424,703.86	\$570,948.99	\$146,245.13
4	79	5/1/08	\$0.00	\$49,906,178.32	\$292,575.13	(\$292,575.13)	\$0.00	\$424,703.86	\$570,948.99	\$146,245.13
4	80	6/1/08	\$0.00	\$50,200,479.00	\$294,300.68	(\$294,300.68)	\$0.00	\$424,703.86	\$570,948.99	\$146,245.13
4	81	7/1/08	\$0.00	\$49,863,691.82	\$296,036.40	\$336,787.18	\$0.00	\$422,654.15	\$570,948.99	\$148,294.84
4	82	8/1/08	\$0.00	\$50,157,550.67	\$293,858.85	(\$293,858.85)	\$0.00	\$422,654.15	\$570,948.99	\$148,294.84
4	83	9/1/08	\$0.00	\$50,453,141.46	\$295,590.78	(\$295,590.78)	\$0.00	\$422,654.15	\$570,948.99	\$148,294.84
4	84	10/1/08	\$0.00	\$50,114,955.88	\$297,332.93	\$338,185.58	\$0.00	\$422,654.15	\$570,948.99	\$148,294.84
4	85	11/1/08	\$0.00	\$50,410,101.00	\$295,145.12	(\$295,145.12)	\$0.00	\$422,654.15	\$570,948.99	\$148,294.84
4	86	12/1/08	\$0.00	\$50,706,984.43	\$296,883.43	(\$296,883.43)	\$0.00	\$422,654.15	\$570,948.99	\$148,294.84
5	87	1/1/09	\$6,984,168.89	\$46,189,223.38	\$297,358.49	\$4,517,761.05	\$5,155,567.41	\$430,691.24	\$582,014.07	\$151,322.84
5	88	2/1/09	\$0.00	\$46,461,075.80	\$271,852.43	(\$271,852.43)	\$0.00	\$430,691.24	\$582,014.07	\$151,322.84
5	89	3/1/09	\$0.00	\$46,734,528.28	\$273,452.48	(\$273,452.48)	\$0.00	\$430,691.24	\$582,014.07	\$151,322.84
5	90	4/1/09	\$0.00	\$46,669,142.37	\$275,061.95	\$65,385.92	\$0.00	\$430,691.24	\$582,014.07	\$151,322.84
5	91	5/1/09	\$0.00	\$46,943,712.49	\$274,570.12	(\$274,570.12)	\$0.00	\$430,691.24	\$582,014.07	\$151,322.84
5	92	6/1/09	\$0.00	\$47,219,898.00	\$276,185.51	(\$276,185.51)	\$0.00	\$430,691.24	\$582,014.07	\$151,322.84
5	93	7/1/09	\$0.00	\$47,497,708.40	\$277,810.40	(\$277,810.40)	\$0.00	\$428,570.00	\$582,014.07	\$153,444.08
5	94	8/1/09	\$0.00	\$47,777,153.25	\$279,444.85	(\$279,444.85)	\$0.00	\$428,570.00	\$582,014.07	\$153,444.08
5	95	9/1/09	\$0.00	\$48,058,242.17	\$281,088.92	(\$281,088.92)	\$0.00	\$428,570.00	\$582,014.07	\$153,444.08
5	96	10/1/09	\$0.00	\$48,340,984.83	\$282,742.66	(\$282,742.66)	\$0.00	\$428,570.00	\$582,014.07	\$153,444.08
5	97	11/1/09	\$0.00	\$48,625,390.95	\$284,406.13	(\$284,406.13)	\$0.00	\$428,570.00	\$582,014.07	\$153,444.08
5	98	12/1/09	\$0.00	\$48,911,470.34	\$286,079.38	(\$286,079.38)	\$0.00	\$428,570.00	\$582,014.07	\$153,444.08

6	99	1/1/10	\$7,119,143.39	\$43,972,181.97	\$287,762.48	\$4,939,288.37	\$5,227,050.85	\$436,685.21	\$593,261.95	\$156,576.74
6	100	2/1/10	\$0.00	\$44,230,884.97	\$258,703.00	(\$258,703.00)	\$0.00	\$436,685.21	\$593,261.95	\$156,576.74
6	101	3/1/10	\$0.00	\$44,491,110.01	\$260,225.04	(\$260,225.04)	\$0.00	\$436,685.21	\$593,261.95	\$156,576.74
6	102	4/1/10	\$0.00	\$44,752,866.04	\$261,756.03	(\$261,756.03)	\$0.00	\$436,685.21	\$593,261.95	\$156,576.74
6	103	5/1/10	\$0.00	\$45,016,162.07	\$263,296.03	(\$263,296.03)	\$0.00	\$436,685.21	\$593,261.95	\$156,576.74
6	104	6/1/10	\$0.00	\$45,281,007.15	\$264,845.09	(\$264,845.09)	\$0.00	\$436,685.21	\$593,261.95	\$156,576.74
6	105	7/1/10	\$0.00	\$45,547,410.41	\$266,403.26	(\$266,403.26)	\$0.00	\$434,489.94	\$593,261.95	\$158,772.01
6	106	8/1/10	\$0.00	\$45,815,381.01	\$267,970.60	(\$267,970.60)	\$0.00	\$434,489.94	\$593,261.95	\$158,772.01
6	107	9/1/10	\$0.00	\$46,084,928.17	\$269,547.16	(\$269,547.16)	\$0.00	\$434,489.94	\$593,261.95	\$158,772.01
6	108	10/1/10	\$0.00	\$46,356,061.16	\$271,132.99	(\$271,132.99)	\$0.00	\$434,489.94	\$593,261.95	\$158,772.01
6	109	11/1/10	\$0.00	\$46,628,789.32	\$272,728.16	(\$272,728.16)	\$0.00	\$434,489.94	\$593,261.95	\$158,772.01
6	110	12/1/10	\$0.00	\$46,903,122.03	\$274,332.71	(\$274,332.71)	\$0.00	\$434,489.94	\$593,261.95	\$158,772.01
7	111	1/1/11	\$7,256,331.49	\$41,880,527.72	\$275,946.70	\$5,022,594.31	\$5,298,541.02	\$442,681.03	\$604,694.29	\$162,013.26
7	112	2/1/11	\$0.00	\$42,126,924.82	\$246,397.10	(\$246,397.10)	\$0.00	\$442,681.03	\$604,694.29	\$162,013.26
7	113	3/1/11	\$0.00	\$42,374,771.57	\$247,846.74	(\$247,846.74)	\$0.00	\$442,681.03	\$604,694.29	\$162,013.26
7	114	4/1/11	\$0.00	\$42,624,076.47	\$249,304.91	(\$249,304.91)	\$0.00	\$442,681.03	\$604,694.29	\$162,013.26
7	115	5/1/11	\$0.00	\$42,874,848.12	\$250,771.65	(\$250,771.65)	\$0.00	\$442,681.03	\$604,694.29	\$162,013.26
7	116	6/1/11	\$0.00	\$43,127,095.14	\$252,247.02	(\$252,247.02)	\$0.00	\$442,681.03	\$604,694.29	\$162,013.26
7	117	7/1/11	\$0.00	\$43,380,826.22	\$253,731.08	(\$253,731.08)	\$0.00	\$440,409.14	\$604,694.29	\$164,285.15
7	118	8/1/11	\$0.00	\$43,636,050.08	\$255,223.86	(\$255,223.86)	\$0.00	\$440,409.14	\$604,694.29	\$164,285.15
7	119	9/1/11	\$0.00	\$43,892,775.51	\$256,725.43	(\$256,725.43)	\$0.00	\$440,409.14	\$604,694.29	\$164,285.15
7	120	10/1/11	\$0.00	\$44,151,011.34	\$258,235.83	(\$258,235.83)	\$0.00	\$440,409.14	\$604,694.29	\$164,285.15
7	121	11/1/11	\$0.00	\$44,410,766.46	\$259,755.12	(\$259,755.12)	\$0.00	\$440,409.14	\$604,694.29	\$164,285.15
7	122	12/1/11	\$0.00	\$44,672,049.80	\$261,283.34	(\$261,283.34)	\$0.00	\$440,409.14	\$604,694.29	\$164,285.15
8	123	1/1/12	\$7,395,752.68	\$39,564,885.51	\$262,820.56	\$5,107,164.29	\$5,369,984.85	\$448,674.32	\$616,312.72	\$167,638.40
8	124	2/1/12	\$0.00	\$39,797,658.92	\$232,773.41	(\$232,773.41)	\$0.00	\$448,674.32	\$616,312.72	\$167,638.40
8	125	3/1/12	\$0.00	\$40,031,801.81	\$234,142.89	(\$234,142.89)	\$0.00	\$448,674.32	\$616,312.72	\$167,638.40
8	126	4/1/12	\$0.00	\$40,267,322.25	\$235,520.43	(\$235,520.43)	\$0.00	\$448,674.32	\$616,312.72	\$167,638.40
8	127	5/1/12	\$0.00	\$40,504,228.33	\$236,906.08	(\$236,906.08)	\$0.00	\$448,674.32	\$616,312.72	\$167,638.40
8	128	6/1/12	\$0.00	\$40,742,528.20	\$238,299.88	(\$238,299.88)	\$0.00	\$448,674.32	\$616,312.72	\$167,638.40
8	129	7/1/12	\$0.00	\$40,982,230.08	\$239,701.87	(\$239,701.87)	\$0.00	\$446,323.15	\$616,312.72	\$169,989.57
8	130	8/1/12	\$0.00	\$41,223,342.20	\$241,112.12	(\$241,112.12)	\$0.00	\$446,323.15	\$616,312.72	\$169,989.57
8	131	9/1/12	\$0.00	\$41,465,872.86	\$242,530.66	(\$242,530.66)	\$0.00	\$446,323.15	\$616,312.72	\$169,989.57
8	132	10/1/12	\$0.00	\$41,709,830.41	\$243,957.55	(\$243,957.55)	\$0.00	\$446,323.15	\$616,312.72	\$169,989.57
8	133	11/1/12	\$0.00	\$41,955,223.25	\$245,392.84	(\$245,392.84)	\$0.00	\$446,323.15	\$616,312.72	\$169,989.57
8	134	12/1/12	\$0.00	\$42,202,059.81	\$246,836.56	(\$246,836.56)	\$0.00	\$446,323.15	\$616,312.72	\$169,989.57
9	135	1/1/13	\$7,537,425.81	\$37,029,758.05	\$248,288.79	\$5,172,301.76	\$5,420,590.55	\$452,932.49	\$628,118.82	\$175,186.32
9	136	2/1/13	\$0.00	\$37,247,616.46	\$217,858.41	(\$217,858.41)	\$0.00	\$452,932.49	\$628,118.82	\$175,186.32
9	137	3/1/13	\$0.00	\$37,466,756.60	\$219,140.14	(\$219,140.14)	\$0.00	\$452,932.49	\$628,118.82	\$175,186.32
9	138	4/1/13	\$0.00	\$37,687,186.02	\$220,429.42	(\$220,429.42)	\$0.00	\$452,932.49	\$628,118.82	\$175,186.32
9	139	5/1/13	\$0.00	\$37,908,912.30	\$221,726.28	(\$221,726.28)	\$0.00	\$452,932.49	\$628,118.82	\$175,186.32
9	140	6/1/13	\$0.00	\$38,131,943.07	\$223,030.77	(\$223,030.77)	\$0.00	\$452,932.49	\$628,118.82	\$175,186.32
9	141	7/1/13	\$0.00	\$38,356,286.00	\$224,342.93	(\$224,342.93)	\$0.00	\$450,499.26	\$628,118.82	\$177,619.55
9	142	8/1/13	\$0.00	\$38,581,948.81	\$225,662.82	(\$225,662.82)	\$0.00	\$450,499.26	\$628,118.82	\$177,619.55
9	143	9/1/13	\$0.00	\$38,808,939.28	\$226,990.47	(\$226,990.47)	\$0.00	\$450,499.26	\$628,118.82	\$177,619.55
9	144	10/1/13	\$0.00	\$39,037,265.21	\$228,325.93	(\$228,325.93)	\$0.00	\$450,499.26	\$628,118.82	\$177,619.55
9	145	11/1/13	\$0.00	\$39,266,934.45	\$229,669.24	(\$229,669.24)	\$0.00	\$450,499.26	\$628,118.82	\$177,619.55
9	146	12/1/13	\$0.00	\$39,497,954.91	\$231,020.46	(\$231,020.46)	\$0.00	\$450,499.26	\$628,118.82	\$177,619.55
10	147	1/1/14	\$7,681,368.97	\$34,217,850.12	\$232,379.63	\$5,280,104.79	\$5,512,484.43	\$460,632.78	\$640,114.08	\$179,481.30
10	148	2/1/14	\$0.00	\$34,419,165.14	\$201,315.02	(\$201,315.02)	\$0.00	\$460,632.78	\$640,114.08	\$179,481.30
10	149	3/1/14	\$0.00	\$34,621,664.56	\$202,499.42	(\$202,499.42)	\$0.00	\$460,632.78	\$640,114.08	\$179,481.30
10	150	4/1/14	\$0.00	\$34,825,355.35	\$203,690.79	(\$203,690.79)	\$0.00	\$460,632.78	\$640,114.08	\$179,481.30
10	151	5/1/14	\$0.00	\$35,030,244.53	\$204,889.17	(\$204,889.17)	\$0.00	\$460,632.78	\$640,114.08	\$179,481.30
10	152	6/1/14	\$0.00	\$35,236,339.13	\$206,094.61	(\$206,094.61)	\$0.00	\$460,632.78	\$640,114.08	\$179,481.30
10	153	7/1/14	\$0.00	\$35,443,646.26	\$207,307.13	(\$207,307.13)	\$0.00	\$458,114.63	\$640,114.08	\$181,999.45
10	154	8/1/14	\$0.00	\$35,652,173.05	\$208,526.79	(\$208,526.79)	\$0.00	\$458,114.63	\$640,114.08	\$181,999.45
10	155	9/1/14	\$0.00	\$35,861,926.67	\$209,753.62	(\$209,753.62)	\$0.00	\$458,114.63	\$640,114.08	\$181,999.45
10	156	10/1/14	\$0.00	\$36,072,914.33	\$210,987.67	(\$210,987.67)	\$0.00	\$458,114.63	\$640,114.08	\$181,999.45
10	157	11/1/14	\$0.00	\$36,285,143.31	\$212,228.98	(\$212,228.98)	\$0.00	\$458,114.63	\$640,114.08	\$181,999.45
10	158	12/1/14	\$0.00	\$36,498,620.91	\$213,477.59	(\$213,477.59)	\$0.00	\$458,114.63	\$640,114.08	\$181,999.45
11	159	1/1/15	\$7,827,599.50	\$31,129,947.60	\$214,733.55	\$5,368,673.31	\$5,583,406.86	\$466,586.92	\$652,299.96	\$185,713.04
11	160	2/1/15	\$0.00	\$31,313,095.46	\$183,147.86	(\$183,147.86)	\$0.00	\$466,586.92	\$652,299.96	\$185,713.04
11	161	3/1/15	\$0.00	\$31,497,320.84	\$184,225.38	(\$184,225.38)	\$0.00	\$466,586.92	\$652,299.96	\$185,713.04
11	162	4/1/15	\$0.00	\$31,682,630.07	\$185,309.24	(\$185,309.24)	\$0.00	\$466,586.92	\$652,299.96	\$185,713.04
11	163	5/1/15	\$0.00	\$31,869,029.55	\$186,399.47	(\$186,399.47)	\$0.00	\$466,586.92	\$652,299.96	\$185,713.04
11	164	6/1/15	\$0.00	\$32,056,525.67	\$187,496.12	(\$187,496.12)	\$0.00	\$466,586.92	\$652,299.96	\$185,713.04
11	165	7/1/15	\$0.00	\$32,245,124.90	\$188,599.23	(\$188,599.23)	\$0.00	\$463,980.89	\$652,299.96	\$188,319.07
11	166	8/1/15	\$0.00	\$32,434,833.72	\$189,708.82	(\$189,708.82)	\$0.00	\$463,980.89	\$652,299.96	\$188,319.07
11	167	9/1/15	\$0.00	\$32,625,658.65	\$190,824.94	(\$190,824.94)	\$0.00	\$463,980.89	\$652,299.96	\$188,319.07
11	168	10/1/15	\$0.00	\$32,817,606.28	\$191,947.63	(\$191,947.63)	\$0.00	\$463,980.89	\$652,299.96	\$188,319.07
11	169	11/1/15	\$0.00	\$33,010,683.20	\$193,076.92	(\$193,076.92)	\$0.00	\$463,980.89	\$652,299.96	\$188,319.07
11	170	12/1/15	\$0.00	\$33,204,896.05	\$194,212.85	(\$194,212.85)	\$0.00	\$463,980.89	\$652,299.96	\$188,319.07

12	171	1/1/16	\$7,976,133.88	\$27,746,233.39	\$195,355.47	\$5,458,662.66	\$5,654,018.13	\$472,516.67	\$664,677.82	\$192,161.15
12	172	2/1/16	\$0.00	\$27,909,473.73	\$163,240.34	(\$163,240.34)	\$0.00	\$472,516.67	\$664,677.82	\$192,161.15
12	173	3/1/16	\$0.00	\$28,073,674.47	\$164,200.74	(\$164,200.74)	\$0.00	\$472,516.67	\$664,677.82	\$192,161.15
12	174	4/1/16	\$0.00	\$28,238,841.25	\$165,166.78	(\$165,166.78)	\$0.00	\$472,516.67	\$664,677.82	\$192,161.15
12	175	5/1/16	\$0.00	\$28,404,979.77	\$166,138.52	(\$166,138.52)	\$0.00	\$472,516.67	\$664,677.82	\$192,161.15
12	176	6/1/16	\$0.00	\$28,572,095.73	\$167,115.96	(\$167,115.96)	\$0.00	\$472,516.67	\$664,677.82	\$192,161.15
12	177	7/1/16	\$0.00	\$28,740,194.89	\$168,099.16	(\$168,099.16)	\$0.00	\$469,819.69	\$664,677.82	\$194,858.14
12	178	8/1/16	\$0.00	\$28,909,283.04	\$169,088.15	(\$169,088.15)	\$0.00	\$469,819.69	\$664,677.82	\$194,858.14
12	179	9/1/16	\$0.00	\$29,079,365.99	\$170,082.95	(\$170,082.95)	\$0.00	\$469,819.69	\$664,677.82	\$194,858.14
12	180	10/1/16	\$0.00	\$29,250,449.59	\$171,083.60	(\$171,083.60)	\$0.00	\$469,819.69	\$664,677.82	\$194,858.14
12	181	11/1/16	\$0.00	\$29,422,539.74	\$172,090.15	(\$172,090.15)	\$0.00	\$469,819.69	\$664,677.82	\$194,858.14
12	182	12/1/16	\$0.00	\$29,595,642.35	\$173,102.61	(\$173,102.61)	\$0.00	\$469,819.69	\$664,677.82	\$194,858.14
13	183	1/1/17	\$8,126,987.68	\$24,069,270.01	\$174,121.03	\$5,526,372.34	\$5,700,493.37	\$476,436.67	\$677,248.97	\$200,812.31
13	184	2/1/17	\$0.00	\$24,210,877.55	\$141,607.54	(\$141,607.54)	\$0.00	\$476,436.67	\$677,248.97	\$200,812.31
13	185	3/1/17	\$0.00	\$24,353,318.21	\$142,440.66	(\$142,440.66)	\$0.00	\$476,436.67	\$677,248.97	\$200,812.31
13	186	4/1/17	\$0.00	\$24,496,596.90	\$143,278.69	(\$143,278.69)	\$0.00	\$476,436.67	\$677,248.97	\$200,812.31
13	187	5/1/17	\$0.00	\$24,640,718.55	\$144,121.65	(\$144,121.65)	\$0.00	\$476,436.67	\$677,248.97	\$200,812.31
13	188	6/1/17	\$0.00	\$24,785,688.11	\$144,969.56	(\$144,969.56)	\$0.00	\$476,436.67	\$677,248.97	\$200,812.31
13	189	7/1/17	\$0.00	\$24,931,510.57	\$145,822.47	(\$145,822.47)	\$0.00	\$473,645.56	\$677,248.97	\$203,603.41
13	190	8/1/17	\$0.00	\$25,078,190.96	\$146,680.39	(\$146,680.39)	\$0.00	\$473,645.56	\$677,248.97	\$203,603.41
13	191	9/1/17	\$0.00	\$25,225,734.32	\$147,543.36	(\$147,543.36)	\$0.00	\$473,645.56	\$677,248.97	\$203,603.41
13	192	10/1/17	\$0.00	\$25,374,145.72	\$148,411.40	(\$148,411.40)	\$0.00	\$473,645.56	\$677,248.97	\$203,603.41
13	193	11/1/17	\$0.00	\$25,523,430.28	\$149,284.56	(\$149,284.56)	\$0.00	\$473,645.56	\$677,248.97	\$203,603.41
13	194	12/1/17	\$0.00	\$25,673,593.12	\$150,162.85	(\$150,162.85)	\$0.00	\$473,645.56	\$677,248.97	\$203,603.41
14	195	1/1/18	\$8,280,175.49	\$20,030,633.02	\$151,046.31	\$5,642,960.11	\$5,794,006.41	\$484,278.13	\$690,014.62	\$205,736.50
14	196	2/1/18	\$0.00	\$20,148,479.91	\$117,846.89	(\$117,846.89)	\$0.00	\$484,278.13	\$690,014.62	\$205,736.50
14	197	3/1/18	\$0.00	\$20,267,020.13	\$118,540.22	(\$118,540.22)	\$0.00	\$484,278.13	\$690,014.62	\$205,736.50
14	198	4/1/18	\$0.00	\$20,386,257.77	\$119,237.64	(\$119,237.64)	\$0.00	\$484,278.13	\$690,014.62	\$205,736.50
14	199	5/1/18	\$0.00	\$20,506,196.92	\$119,939.15	(\$119,939.15)	\$0.00	\$484,278.13	\$690,014.62	\$205,736.50
14	200	6/1/18	\$0.00	\$20,626,841.71	\$120,644.79	(\$120,644.79)	\$0.00	\$484,278.13	\$690,014.62	\$205,736.50
14	201	7/1/18	\$0.00	\$20,748,196.29	\$121,354.59	(\$121,354.59)	\$0.00	\$481,389.61	\$690,014.62	\$208,625.02
14	202	8/1/18	\$0.00	\$20,870,264.85	\$122,068.55	(\$122,068.55)	\$0.00	\$481,389.61	\$690,014.62	\$208,625.02
14	203	9/1/18	\$0.00	\$20,993,051.57	\$122,786.72	(\$122,786.72)	\$0.00	\$481,389.61	\$690,014.62	\$208,625.02
14	204	10/1/18	\$0.00	\$21,116,560.69	\$123,509.12	(\$123,509.12)	\$0.00	\$481,389.61	\$690,014.62	\$208,625.02
14	205	11/1/18	\$0.00	\$21,240,796.46	\$124,235.77	(\$124,235.77)	\$0.00	\$481,389.61	\$690,014.62	\$208,625.02
14	206	12/1/18	\$0.00	\$21,365,763.15	\$124,966.69	(\$124,966.69)	\$0.00	\$481,389.61	\$690,014.62	\$208,625.02
15	207	1/1/19	\$8,435,710.87	\$15,628,246.35	\$125,701.91	\$5,737,516.80	\$5,863,218.70	\$490,096.22	\$702,975.91	\$212,879.68
15	208	2/1/19	\$0.00	\$15,720,192.53	\$91,946.18	(\$91,946.18)	\$0.00	\$490,096.22	\$702,975.91	\$212,879.68
15	209	3/1/19	\$0.00	\$15,812,679.66	\$92,487.13	(\$92,487.13)	\$0.00	\$490,096.22	\$702,975.91	\$212,879.68
15	210	4/1/19	\$0.00	\$15,905,710.93	\$93,031.27	(\$93,031.27)	\$0.00	\$490,096.22	\$702,975.91	\$212,879.68
15	211	5/1/19	\$0.00	\$15,999,289.53	\$93,578.60	(\$93,578.60)	\$0.00	\$490,096.22	\$702,975.91	\$212,879.68
15	212	6/1/19	\$0.00	\$16,093,418.68	\$94,129.15	(\$94,129.15)	\$0.00	\$490,096.22	\$702,975.91	\$212,879.68
15	213	7/1/19	\$0.00	\$16,188,101.63	\$94,682.95	(\$94,682.95)	\$0.00	\$487,106.89	\$702,975.91	\$215,869.01
15	214	8/1/19	\$0.00	\$16,283,341.63	\$95,240.00	(\$95,240.00)	\$0.00	\$487,106.89	\$702,975.91	\$215,869.01
15	215	9/1/19	\$0.00	\$16,379,141.95	\$95,800.33	(\$95,800.33)	\$0.00	\$487,106.89	\$702,975.91	\$215,869.01
15	216	10/1/19	\$0.00	\$16,475,505.91	\$96,363.95	(\$96,363.95)	\$0.00	\$487,106.89	\$702,975.91	\$215,869.01
15	217	11/1/19	\$0.00	\$16,572,436.80	\$96,930.89	(\$96,930.89)	\$0.00	\$487,106.89	\$702,975.91	\$215,869.01
15	218	12/1/19	\$0.00	\$16,669,937.97	\$97,501.17	(\$97,501.17)	\$0.00	\$487,106.89	\$702,975.91	\$215,869.01
16	219	1/1/20	\$8,593,606.24	\$10,836,220.61	\$98,074.80	\$5,833,717.36	\$5,931,792.16	\$495,862.84	\$716,133.85	\$220,271.01
16	220	2/1/20	\$0.00	\$10,899,973.71	\$63,753.10	(\$63,753.10)	\$0.00	\$495,862.84	\$716,133.85	\$220,271.01
16	221	3/1/20	\$0.00	\$10,964,101.89	\$64,128.18	(\$64,128.18)	\$0.00	\$495,862.84	\$716,133.85	\$220,271.01
16	222	4/1/20	\$0.00	\$11,028,607.36	\$64,505.47	(\$64,505.47)	\$0.00	\$495,862.84	\$716,133.85	\$220,271.01
16	223	5/1/20	\$0.00	\$11,093,492.33	\$64,884.97	(\$64,884.97)	\$0.00	\$495,862.84	\$716,133.85	\$220,271.01
16	224	6/1/20	\$0.00	\$11,158,759.04	\$65,266.71	(\$65,266.71)	\$0.00	\$495,862.84	\$716,133.85	\$220,271.01
16	225	7/1/20	\$0.00	\$11,224,409.74	\$65,650.70	(\$65,650.70)	\$0.00	\$492,769.18	\$716,133.85	\$223,364.67
16	226	8/1/20	\$0.00	\$11,290,446.69	\$66,036.94	(\$66,036.94)	\$0.00	\$492,769.18	\$716,133.85	\$223,364.67
16	227	9/1/20	\$0.00	\$11,356,872.15	\$66,425.46	(\$66,425.46)	\$0.00	\$492,769.18	\$716,133.85	\$223,364.67
16	228	10/1/20	\$0.00	\$11,423,688.41	\$66,816.26	(\$66,816.26)	\$0.00	\$492,769.18	\$716,133.85	\$223,364.67
16	229	11/1/20	\$0.00	\$11,490,897.78	\$67,209.37	(\$67,209.37)	\$0.00	\$492,769.18	\$716,133.85	\$223,364.67
16	230	12/1/20	\$0.00	\$11,558,502.56	\$67,604.78	(\$67,604.78)	\$0.00	\$492,769.18	\$716,133.85	\$223,364.67
17	231	1/1/21	\$8,753,872.83	\$5,654,084.02	\$68,002.52	\$5,904,418.54	\$5,972,421.06	\$499,302.57	\$729,489.40	\$230,186.84
17	232	2/1/21	\$0.00	\$5,687,348.88	\$33,264.86	(\$33,264.86)	\$0.00	\$499,302.57	\$729,489.40	\$230,186.84
17	233	3/1/21	\$0.00	\$5,720,809.45	\$33,460.57	(\$33,460.57)	\$0.00	\$499,302.57	\$729,489.40	\$230,186.84
17	234	4/1/21	\$0.00	\$5,754,466.88	\$33,657.43	(\$33,657.43)	\$0.00	\$499,302.57	\$729,489.40	\$230,186.84
17	235	5/1/21	\$0.00	\$5,788,322.32	\$33,855.45	(\$33,855.45)	\$0.00	\$499,302.57	\$729,489.40	\$230,186.84
17	236	6/1/21	\$0.00	\$5,822,376.95	\$34,054.63	(\$34,054.63)	\$0.00	\$499,302.57	\$729,489.40	\$230,186.84
17	237	7/1/21	\$0.00	\$5,856,631.94	\$34,254.98	(\$34,254.98)	\$0.00	\$496,100.94	\$729,489.40	\$233,388.46
17	238	8/1/21	\$0.00	\$5,891,088.46	\$34,456.52	(\$34,456.52)	\$0.00	\$496,100.94	\$729,489.40	\$233,388.46
17	239	9/1/21	\$0.00	\$5,925,747.69	\$34,659.24	(\$34,659.24)	\$0.00	\$496,100.94	\$729,489.40	\$233,388.46
17	240	10/1/21	\$0.00	\$5,960,610.84	\$34,863.15	(\$34,863.15)	\$0.00	\$496,100.94	\$729,489.40	\$233,388.46
17	241	11/1/21	\$0.00	\$5,995,679.10	\$35,068.26	(\$35,068.26)	\$0.00	\$496,100.94	\$729,489.40	\$233,388.46
17	242	12/1/21	\$0.00	\$6,030,953.68	\$35,274.58	(\$35,274.58)	\$0.00	\$496,100.94	\$729,489.40	\$233,388.46

18	243	1/1/22	\$8,916,307.47	\$0.00	\$35,482.11	\$6,030,953.68	\$6,066,435.79	\$507,210.76	\$743,043.38	\$235,832.63
18	244	2/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$507,210.76	\$743,043.38	\$235,832.63
18	245	3/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$507,210.76	\$743,043.38	\$235,832.63
18	246	4/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$507,210.76	\$743,043.38	\$235,832.63
18	247	5/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$507,210.76	\$743,043.38	\$235,832.63
18	248	6/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$507,210.76	\$743,043.38	\$235,832.63
18	249	7/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$503,897.40	\$743,043.38	\$239,145.99
18	250	8/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$503,897.40	\$743,043.38	\$239,145.99
18	251	9/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$503,897.40	\$743,043.38	\$239,145.99
18	252	10/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$503,897.40	\$743,043.38	\$239,145.99
18	253	11/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$503,897.40	\$743,043.38	\$239,145.99
18	254	12/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$503,897.40	\$743,043.38	\$239,145.99

Note: Opening Balance reflects 30 days of interest accumulated from end of construction period.

Performance Period Payment Schedule - Debt Service Component

Year	Period	Date	Project 2 - Performance Period Payments				Project 3 - Performance Period Payments				Project 2 (mod) - Performance Period Payments			
			Balance	Interest	Principal	Total	Balance	Interest	Principal	Total	Balance	Interest	Principal	Total
1	39	1/1/05	\$8,744,664.83	\$44,027.63	\$549,741.27	\$2,415,868.68	\$44,354,593.36	\$273,715.86	\$2,169,348.21	\$2,443,064.06	\$53,099,258.19	\$317,743.48	\$2,719,089.48	\$4,858,932.74
1	40	2/1/05	\$8,798,881.75	\$54,216.92	(\$54,216.92)	\$0.00	\$44,615,546.22	\$260,952.86	(\$260,952.86)	\$0.00	\$53,414,427.97	\$315,169.78	(\$315,169.78)	\$0.00
1	41	3/1/05	\$8,853,434.82	\$54,553.07	(\$54,553.07)	\$0.00	\$44,878,034.35	\$262,488.13	(\$262,488.13)	\$0.00	\$53,731,469.17	\$317,041.20	(\$317,041.20)	\$0.00
1	42	4/1/05	\$8,300,959.52	\$54,891.30	\$552,475.30	\$0.00	\$45,142,066.79	\$264,032.44	(\$264,032.44)	\$0.00	\$53,443,026.31	\$318,923.73	\$288,442.86	\$0.00
1	43	5/1/05	\$8,352,425.47	\$51,465.95	(\$51,465.95)	\$0.00	\$45,407,652.61	\$265,585.83	(\$265,585.83)	\$0.00	\$53,760,078.09	\$317,051.78	(\$317,051.78)	\$0.00
1	44	6/1/05	\$8,404,210.51	\$51,785.04	(\$51,785.04)	\$0.00	\$45,674,800.97	\$267,148.36	(\$267,148.36)	\$0.00	\$54,079,011.48	\$318,933.39	(\$318,933.39)	\$0.00
1	45	7/1/05	\$7,848,950.02	\$52,106.11	\$555,260.49	\$0.00	\$45,943,521.05	\$268,720.08	(\$268,720.08)	\$0.00	\$53,792,471.07	\$320,826.18	\$286,540.41	\$0.00
1	46	8/1/05	\$7,897,613.51	\$48,663.49	(\$48,663.49)	\$0.00	\$46,213,822.10	\$270,301.05	(\$270,301.05)	\$0.00	\$54,111,435.61	\$318,964.54	(\$318,964.54)	\$0.00
1	47	9/1/05	\$7,946,578.72	\$48,965.20	(\$48,965.20)	\$0.00	\$46,485,713.42	\$271,891.32	(\$271,891.32)	\$0.00	\$54,432,292.13	\$320,856.52	(\$320,856.52)	\$0.00
1	48	10/1/05	\$7,388,480.91	\$49,268.79	\$558,097.80	\$0.00	\$46,759,204.36	\$273,490.95	(\$273,490.95)	\$0.00	\$54,147,685.28	\$322,759.74	\$284,606.86	\$0.00
1	49	11/1/05	\$7,434,289.49	\$45,808.58	(\$45,808.58)	\$0.00	\$47,034,304.35	\$275,099.99	(\$275,099.99)	\$0.00	\$54,468,593.84	\$320,908.57	(\$320,908.57)	\$0.00
1	50	12/1/05	\$7,480,382.09	\$46,092.59	(\$46,092.59)	\$0.00	\$47,311,022.84	\$276,718.49	(\$276,718.49)	\$0.00	\$54,791,404.93	\$322,811.09	(\$322,811.09)	\$0.00
2	51	1/1/06	\$6,917,177.38	\$32,616.04	\$563,204.70	\$2,437,796.63	\$45,097,691.07	\$278,346.52	\$2,213,331.77	\$2,491,678.29	\$52,014,868.45	\$310,962.56	\$2,776,536.48	\$4,929,474.92
2	52	2/1/06	\$6,960,063.88	\$42,886.50	(\$42,886.50)	\$0.00	\$45,363,015.82	\$265,324.75	(\$265,324.75)	\$0.00	\$52,323,079.70	\$308,211.25	(\$308,211.25)	\$0.00
2	53	3/1/06	\$7,003,216.28	\$43,152.40	(\$43,152.40)	\$0.00	\$45,629,901.56	\$266,885.74	(\$266,885.74)	\$0.00	\$52,633,117.84	\$310,038.14	(\$310,038.14)	\$0.00
2	54	4/1/06	\$6,434,836.66	\$43,419.94	\$568,379.62	\$0.00	\$45,898,357.48	\$268,455.92	(\$268,455.92)	\$0.00	\$52,333,194.14	\$311,875.86	\$299,923.70	\$0.00
2	55	5/1/06	\$6,474,732.65	\$39,895.99	(\$39,895.99)	\$0.00	\$46,168,392.82	\$270,035.34	(\$270,035.34)	\$0.00	\$52,643,125.47	\$309,931.32	(\$309,931.32)	\$0.00
2	56	6/1/06	\$6,514,875.99	\$40,143.34	(\$40,143.34)	\$0.00	\$46,440,016.86	\$271,624.04	(\$271,624.04)	\$0.00	\$52,954,892.85	\$311,767.39	(\$311,767.39)	\$0.00
2	57	7/1/06	\$5,941,276.26	\$40,392.23	\$573,599.73	\$0.00	\$46,713,238.96	\$273,222.10	(\$273,222.10)	\$0.00	\$52,654,515.22	\$313,614.33	\$300,377.63	\$0.00
2	58	8/1/06	\$5,978,112.18	\$36,835.91	(\$36,835.91)	\$0.00	\$46,988,068.52	\$274,829.56	(\$274,829.56)	\$0.00	\$52,966,180.69	\$311,665.47	(\$311,665.47)	\$0.00
2	59	9/1/06	\$6,015,176.47	\$37,064.30	(\$37,064.30)	\$0.00	\$47,264,514.99	\$276,446.47	(\$276,446.47)	\$0.00	\$53,279,691.46	\$313,510.77	(\$313,510.77)	\$0.00
2	60	10/1/06	\$5,436,286.20	\$37,294.09	\$578,890.27	\$0.00	\$47,542,587.88	\$278,072.90	(\$278,072.90)	\$0.00	\$52,978,874.08	\$315,366.99	\$300,817.37	\$0.00
2	61	11/1/06	\$5,469,991.18	\$33,704.97	(\$33,704.97)	\$0.00	\$47,822,296.77	\$279,708.89	(\$279,708.89)	\$0.00	\$53,292,287.95	\$313,413.87	(\$313,413.87)	\$0.00
2	62	12/1/06	\$5,503,905.12	\$33,913.95	(\$33,913.95)	\$0.00	\$48,103,651.29	\$281,354.51	(\$281,354.51)	\$0.00	\$53,607,556.41	\$315,268.46	(\$315,268.46)	\$0.00
3	63	1/1/07	\$4,919,622.07	\$20,166.59	\$584,283.05	\$2,472,674.69	\$45,860,510.21	\$283,009.82	\$2,243,141.08	\$2,526,150.89	\$50,780,132.28	\$303,176.41	\$2,827,424.13	\$4,998,825.58
3	64	2/1/07	\$4,950,123.73	\$30,501.66	(\$30,501.66)	\$0.00	\$46,130,322.88	\$269,812.67	(\$269,812.67)	\$0.00	\$51,080,446.60	\$300,314.33	(\$300,314.33)	\$0.00
3	65	3/1/07	\$4,980,814.49	\$30,690.77	(\$30,690.77)	\$0.00	\$46,401,722.94	\$271,400.07	(\$271,400.07)	\$0.00	\$51,382,537.44	\$302,090.83	(\$302,090.83)	\$0.00
3	66	4/1/07	\$4,391,065.38	\$30,881.05	\$589,749.12	\$0.00	\$46,674,719.75	\$272,996.80	(\$272,996.80)	\$0.00	\$51,065,785.13	\$303,877.85	\$316,752.31	\$0.00
3	67	5/1/07	\$4,418,289.98	\$27,224.61	(\$27,224.61)	\$0.00	\$46,949,322.68	\$274,602.93	(\$274,602.93)	\$0.00	\$51,367,612.66	\$301,827.54	(\$301,827.54)	\$0.00
3	68	6/1/07	\$4,445,683.38	\$27,393.40	(\$27,393.40)	\$0.00	\$47,225,541.20	\$276,218.52	(\$276,218.52)	\$0.00	\$51,671,224.58	\$303,611.91	(\$303,611.91)	\$0.00
3	69	7/1/07	\$3,850,504.94	\$27,563.24	\$595,178.44	\$0.00	\$47,503,384.80	\$277,843.60	(\$277,843.60)	\$0.00	\$51,353,889.73	\$305,406.84	\$317,334.84	\$0.00
3	70	8/1/07	\$3,874,378.07	\$23,873.13	(\$23,873.13)	\$0.00	\$47,782,863.05	\$279,478.25	(\$279,478.25)	\$0.00	\$51,657,241.11	\$303,351.38	(\$303,351.38)	\$0.00
3	71	9/1/07	\$3,898,399.21	\$24,021.14	(\$24,021.14)	\$0.00	\$48,063,985.56	\$281,122.51	(\$281,122.51)	\$0.00	\$51,962,384.77	\$305,143.65	(\$305,143.65)	\$0.00
3	72	10/1/07	\$3,297,716.09	\$24,170.08	\$600,683.12	\$0.00	\$48,346,762.00	\$282,776.45	(\$282,776.45)	\$0.00	\$51,644,478.09	\$306,946.52	\$317,906.67	\$0.00
3	73	11/1/07	\$3,318,161.93	\$20,445.84	(\$20,445.84)	\$0.00	\$48,631,202.12	\$284,440.12	(\$284,440.12)	\$0.00	\$51,949,364.05	\$304,885.96	(\$304,885.96)	\$0.00
3	74	12/1/07	\$3,338,734.53	\$20,572.60	(\$20,572.60)	\$0.00	\$48,917,315.69	\$286,113.57	(\$286,113.57)	\$0.00	\$52,256,050.22	\$306,686.18	(\$306,686.18)	\$0.00
4	75	1/1/08	\$2,731,943.77	\$6,512.48	\$606,790.77	\$2,511,773.97	\$46,632,738.50	\$287,796.87	\$2,284,577.19	\$2,572,374.07	\$49,364,682.26	\$294,309.36	\$2,891,367.96	\$5,084,148.04
4	76	2/1/08	\$2,748,881.82	\$16,938.05	(\$16,938.05)	\$0.00	\$46,907,094.44	\$274,355.94	(\$274,355.94)	\$0.00	\$49,655,976.26	\$291,294.00	(\$291,294.00)	\$0.00
4	77	3/1/08	\$2,765,924.88	\$17,043.07	(\$17,043.07)	\$0.00	\$47,183,064.52	\$275,970.07	(\$275,970.07)	\$0.00	\$49,948,989.40	\$293,013.14	(\$293,013.14)	\$0.00
4	78	4/1/08	\$2,152,944.98	\$17,148.73	\$612,979.91	\$0.00	\$47,460,658.21	\$277,593.70	(\$277,593.70)	\$0.00	\$49,613,603.19	\$294,742.43	\$335,386.21	\$0.00
4	79	5/1/08	\$2,166,293.24	\$13,348.26	(\$13,348.26)	\$0.00	\$47,739,885.08	\$279,226.87	(\$279,226.87)	\$0.00	\$49,906,178.32	\$292,575.13	(\$292,575.13)	\$0.00
4	80	6/1/08	\$2,179,724.25	\$13,431.02	(\$13,431.02)	\$0.00	\$48,020,754.74	\$280,869.66	(\$280,869.66)	\$0.00	\$50,200,479.00	\$294,300.68	(\$294,300.68)	\$0.00
4	81	7/1/08	\$1,560,414.97	\$13,514.29	\$619,309.28	\$0.00	\$48,303,276.85	\$282,522.11	(\$282,522.11)	\$0.00	\$49,863,691.82	\$296,036.40	\$336,787.18	\$0.00
4	82	8/1/08	\$1,570,089.54	\$9,674.57	(\$9,674.57)	\$0.00	\$48,587,461.13	\$284,184.28	(\$284,184.28)	\$0.00	\$50,157,550.67	\$293,858.85	(\$293,858.85)	\$0.00
4	83	9/1/08	\$1,579,824.10	\$9,734.56	(\$9,734.56)	\$0.00	\$48,873,317.36	\$285,856.23	(\$285,856.23)	\$0.00	\$50,453,141.46	\$295,590.78	(\$295,590.78)	\$0.00
4	84	10/1/08	\$954,100.50	\$9,794.91	\$625,723.60	\$0.00	\$49,160,855.37	\$287,538.02	(\$287,538.02)	\$0.00	\$50,114,955.88	\$297,332.93	\$338,185.58	\$0.00
4	85	11/1/08	\$960,015.93	\$5,915.42	(\$5,915.42)	\$0.00	\$49,450,085.07	\$289,229.70	(\$289,229.70)	\$0.00	\$50,410,101.00	\$295,145.12	(\$295,145.12)	\$0.00
4	86	12/1/08	\$965,968.03	\$5,952.10	(\$5,952.10)	\$0.00	\$49,741,016.41	\$290,931.33	(\$290,931.33)	\$0.00	\$50,706,984.43	\$296,883.43	(\$296,883.43)	\$0.00

5	87	1/1/09	\$334,193.25	\$4,715.51	\$631,774.77	\$976,938.15	\$45,855,030.12	\$292,642.98	\$3,885,986.28	\$4,178,629.26	\$46,189,223.38	\$297,358.49	\$4,517,761.05	\$5,155,567.41
5	88	2/1/09	\$336,265.25	\$2,072.00	(\$2,072.00)	\$0.00	\$46,124,810.55	\$269,780.43	(\$269,780.43)	\$0.00	\$46,461,075.80	\$271,852.43	(\$271,852.43)	\$0.00
5	89	3/1/09	\$338,350.10	\$2,084.84	(\$2,084.84)	\$0.00	\$46,396,178.19	\$271,367.64	(\$271,367.64)	\$0.00	\$46,734,528.28	\$273,452.48	(\$273,452.48)	\$0.00
5	90	4/1/09	\$0.00	\$2,097.77	\$338,350.10	\$0.00	\$46,669,142.37	\$272,964.18	(\$272,964.18)	\$0.00	\$46,669,142.37	\$275,061.95	\$65,385.92	\$0.00
5	91	5/1/09	\$0.00	\$0.00	\$0.00	\$0.00	\$46,943,712.49	\$274,570.12	(\$274,570.12)	\$0.00	\$46,943,712.49	\$274,570.12	(\$274,570.12)	\$0.00
5	92	6/1/09	\$0.00	\$0.00	\$0.00	\$0.00	\$47,219,898.00	\$276,185.51	(\$276,185.51)	\$0.00	\$47,219,898.00	\$276,185.51	(\$276,185.51)	\$0.00
5	93	7/1/09	\$0.00	\$0.00	\$0.00	\$0.00	\$47,497,708.40	\$277,810.40	(\$277,810.40)	\$0.00	\$47,497,708.40	\$277,810.40	(\$277,810.40)	\$0.00
5	94	8/1/09	\$0.00	\$0.00	\$0.00	\$0.00	\$47,777,153.25	\$279,444.85	(\$279,444.85)	\$0.00	\$47,777,153.25	\$279,444.85	(\$279,444.85)	\$0.00
5	95	9/1/09	\$0.00	\$0.00	\$0.00	\$0.00	\$48,058,242.17	\$281,088.92	(\$281,088.92)	\$0.00	\$48,058,242.17	\$281,088.92	(\$281,088.92)	\$0.00
5	96	10/1/09	\$0.00	\$0.00	\$0.00	\$0.00	\$48,340,984.83	\$282,742.66	(\$282,742.66)	\$0.00	\$48,340,984.83	\$282,742.66	(\$282,742.66)	\$0.00
5	97	11/1/09	\$0.00	\$0.00	\$0.00	\$0.00	\$48,625,390.95	\$284,406.13	(\$284,406.13)	\$0.00	\$48,625,390.95	\$284,406.13	(\$284,406.13)	\$0.00
5	98	12/1/09	\$0.00	\$0.00	\$0.00	\$0.00	\$48,911,470.34	\$286,079.38	(\$286,079.38)	\$0.00	\$48,911,470.34	\$286,079.38	(\$286,079.38)	\$0.00
6	99	1/1/10	\$0.00	\$0.00	\$0.00	\$0.00	\$43,972,181.97	\$287,762.48	\$4,939,288.37	\$5,227,050.85	\$43,972,181.97	\$287,762.48	\$4,939,288.37	\$5,227,050.85
6	100	2/1/10	\$0.00	\$0.00	\$0.00	\$0.00	\$44,230,884.97	\$258,703.00	(\$258,703.00)	\$0.00	\$44,230,884.97	\$258,703.00	(\$258,703.00)	\$0.00
6	101	3/1/10	\$0.00	\$0.00	\$0.00	\$0.00	\$44,491,110.01	\$260,225.04	(\$260,225.04)	\$0.00	\$44,491,110.01	\$260,225.04	(\$260,225.04)	\$0.00
6	102	4/1/10	\$0.00	\$0.00	\$0.00	\$0.00	\$44,752,866.04	\$261,756.03	(\$261,756.03)	\$0.00	\$44,752,866.04	\$261,756.03	(\$261,756.03)	\$0.00
6	103	5/1/10	\$0.00	\$0.00	\$0.00	\$0.00	\$45,016,162.07	\$263,296.03	(\$263,296.03)	\$0.00	\$45,016,162.07	\$263,296.03	(\$263,296.03)	\$0.00
6	104	6/1/10	\$0.00	\$0.00	\$0.00	\$0.00	\$45,281,007.15	\$264,845.09	(\$264,845.09)	\$0.00	\$45,281,007.15	\$264,845.09	(\$264,845.09)	\$0.00
6	105	7/1/10	\$0.00	\$0.00	\$0.00	\$0.00	\$45,547,410.41	\$266,403.26	(\$266,403.26)	\$0.00	\$45,547,410.41	\$266,403.26	(\$266,403.26)	\$0.00
6	106	8/1/10	\$0.00	\$0.00	\$0.00	\$0.00	\$45,815,381.01	\$267,970.60	(\$267,970.60)	\$0.00	\$45,815,381.01	\$267,970.60	(\$267,970.60)	\$0.00
6	107	9/1/10	\$0.00	\$0.00	\$0.00	\$0.00	\$46,084,928.17	\$269,547.16	(\$269,547.16)	\$0.00	\$46,084,928.17	\$269,547.16	(\$269,547.16)	\$0.00
6	108	10/1/10	\$0.00	\$0.00	\$0.00	\$0.00	\$46,356,061.16	\$271,132.99	(\$271,132.99)	\$0.00	\$46,356,061.16	\$271,132.99	(\$271,132.99)	\$0.00
6	109	11/1/10	\$0.00	\$0.00	\$0.00	\$0.00	\$46,628,789.32	\$272,728.16	(\$272,728.16)	\$0.00	\$46,628,789.32	\$272,728.16	(\$272,728.16)	\$0.00
6	110	12/1/10	\$0.00	\$0.00	\$0.00	\$0.00	\$46,903,122.03	\$274,332.71	(\$274,332.71)	\$0.00	\$46,903,122.03	\$274,332.71	(\$274,332.71)	\$0.00
7	111	1/1/11	\$0.00	\$0.00	\$0.00	\$0.00	\$41,880,527.72	\$275,946.70	\$5,022,594.31	\$5,298,541.02	\$41,880,527.72	\$275,946.70	\$5,022,594.31	\$5,298,541.02
7	112	2/1/11	\$0.00	\$0.00	\$0.00	\$0.00	\$42,126,924.82	\$246,397.10	(\$246,397.10)	\$0.00	\$42,126,924.82	\$246,397.10	(\$246,397.10)	\$0.00
7	113	3/1/11	\$0.00	\$0.00	\$0.00	\$0.00	\$42,374,771.57	\$247,846.74	(\$247,846.74)	\$0.00	\$42,374,771.57	\$247,846.74	(\$247,846.74)	\$0.00
7	114	4/1/11	\$0.00	\$0.00	\$0.00	\$0.00	\$42,624,076.47	\$249,304.91	(\$249,304.91)	\$0.00	\$42,624,076.47	\$249,304.91	(\$249,304.91)	\$0.00
7	115	5/1/11	\$0.00	\$0.00	\$0.00	\$0.00	\$42,874,848.12	\$250,771.65	(\$250,771.65)	\$0.00	\$42,874,848.12	\$250,771.65	(\$250,771.65)	\$0.00
7	116	6/1/11	\$0.00	\$0.00	\$0.00	\$0.00	\$43,127,095.14	\$252,247.02	(\$252,247.02)	\$0.00	\$43,127,095.14	\$252,247.02	(\$252,247.02)	\$0.00
7	117	7/1/11	\$0.00	\$0.00	\$0.00	\$0.00	\$43,380,826.22	\$253,731.08	(\$253,731.08)	\$0.00	\$43,380,826.22	\$253,731.08	(\$253,731.08)	\$0.00
7	118	8/1/11	\$0.00	\$0.00	\$0.00	\$0.00	\$43,636,050.08	\$255,223.86	(\$255,223.86)	\$0.00	\$43,636,050.08	\$255,223.86	(\$255,223.86)	\$0.00
7	119	9/1/11	\$0.00	\$0.00	\$0.00	\$0.00	\$43,892,775.51	\$256,725.43	(\$256,725.43)	\$0.00	\$43,892,775.51	\$256,725.43	(\$256,725.43)	\$0.00
7	120	10/1/11	\$0.00	\$0.00	\$0.00	\$0.00	\$44,151,011.34	\$258,235.83	(\$258,235.83)	\$0.00	\$44,151,011.34	\$258,235.83	(\$258,235.83)	\$0.00
7	121	11/1/11	\$0.00	\$0.00	\$0.00	\$0.00	\$44,410,766.46	\$259,755.12	(\$259,755.12)	\$0.00	\$44,410,766.46	\$259,755.12	(\$259,755.12)	\$0.00
7	122	12/1/11	\$0.00	\$0.00	\$0.00	\$0.00	\$44,672,049.80	\$261,283.34	(\$261,283.34)	\$0.00	\$44,672,049.80	\$261,283.34	(\$261,283.34)	\$0.00
8	123	1/1/12	\$0.00	\$0.00	\$0.00	\$0.00	\$39,564,885.51	\$262,820.56	\$5,107,164.29	\$5,369,984.85	\$39,564,885.51	\$262,820.56	\$5,107,164.29	\$5,369,984.85
8	124	2/1/12	\$0.00	\$0.00	\$0.00	\$0.00	\$39,797,658.92	\$232,773.41	(\$232,773.41)	\$0.00	\$39,797,658.92	\$232,773.41	(\$232,773.41)	\$0.00
8	125	3/1/12	\$0.00	\$0.00	\$0.00	\$0.00	\$40,031,801.81	\$234,142.89	(\$234,142.89)	\$0.00	\$40,031,801.81	\$234,142.89	(\$234,142.89)	\$0.00
8	126	4/1/12	\$0.00	\$0.00	\$0.00	\$0.00	\$40,267,322.25	\$235,520.43	(\$235,520.43)	\$0.00	\$40,267,322.25	\$235,520.43	(\$235,520.43)	\$0.00
8	127	5/1/12	\$0.00	\$0.00	\$0.00	\$0.00	\$40,504,228.33	\$236,906.08	(\$236,906.08)	\$0.00	\$40,504,228.33	\$236,906.08	(\$236,906.08)	\$0.00
8	128	6/1/12	\$0.00	\$0.00	\$0.00	\$0.00	\$40,742,528.20	\$238,299.88	(\$238,299.88)	\$0.00	\$40,742,528.20	\$238,299.88	(\$238,299.88)	\$0.00
8	129	7/1/12	\$0.00	\$0.00	\$0.00	\$0.00	\$40,982,230.08	\$239,701.87	(\$239,701.87)	\$0.00	\$40,982,230.08	\$239,701.87	(\$239,701.87)	\$0.00
8	130	8/1/12	\$0.00	\$0.00	\$0.00	\$0.00	\$41,223,342.20	\$241,112.12	(\$241,112.12)	\$0.00	\$41,223,342.20	\$241,112.12	(\$241,112.12)	\$0.00
8	131	9/1/12	\$0.00	\$0.00	\$0.00	\$0.00	\$41,465,872.86	\$242,530.66	(\$242,530.66)	\$0.00	\$41,465,872.86	\$242,530.66	(\$242,530.66)	\$0.00
8	132	10/1/12	\$0.00	\$0.00	\$0.00	\$0.00	\$41,709,830.41	\$243,957.55	(\$243,957.55)	\$0.00	\$41,709,830.41	\$243,957.55	(\$243,957.55)	\$0.00
8	133	11/1/12	\$0.00	\$0.00	\$0.00	\$0.00	\$41,955,223.25	\$245,392.84	(\$245,392.84)	\$0.00	\$41,955,223.25	\$245,392.84	(\$245,392.84)	\$0.00
8	134	12/1/12	\$0.00	\$0.00	\$0.00	\$0.00	\$42,202,059.81	\$246,836.56	(\$246,836.56)	\$0.00	\$42,202,059.81	\$246,836.56	(\$246,836.56)	\$0.00

9	135	1/1/13	\$0.00	\$0.00	\$0.00	\$0.00	\$37,029,758.05	\$248,288.79	\$5,172,301.76	\$5,420,590.55	\$37,029,758.05	\$248,288.79	\$5,172,301.76	\$5,420,590.55
9	136	2/1/13	\$0.00	\$0.00	\$0.00	\$0.00	\$37,247,616.46	\$217,858.41	(\$217,858.41)	\$0.00	\$37,247,616.46	\$217,858.41	(\$217,858.41)	\$0.00
9	137	3/1/13	\$0.00	\$0.00	\$0.00	\$0.00	\$37,466,756.60	\$219,140.14	(\$219,140.14)	\$0.00	\$37,466,756.60	\$219,140.14	(\$219,140.14)	\$0.00
9	138	4/1/13	\$0.00	\$0.00	\$0.00	\$0.00	\$37,687,186.02	\$220,429.42	(\$220,429.42)	\$0.00	\$37,687,186.02	\$220,429.42	(\$220,429.42)	\$0.00
9	139	5/1/13	\$0.00	\$0.00	\$0.00	\$0.00	\$37,908,912.30	\$221,726.28	(\$221,726.28)	\$0.00	\$37,908,912.30	\$221,726.28	(\$221,726.28)	\$0.00
9	140	6/1/13	\$0.00	\$0.00	\$0.00	\$0.00	\$38,131,943.07	\$223,030.77	(\$223,030.77)	\$0.00	\$38,131,943.07	\$223,030.77	(\$223,030.77)	\$0.00
9	141	7/1/13	\$0.00	\$0.00	\$0.00	\$0.00	\$38,356,286.00	\$224,342.93	(\$224,342.93)	\$0.00	\$38,356,286.00	\$224,342.93	(\$224,342.93)	\$0.00
9	142	8/1/13	\$0.00	\$0.00	\$0.00	\$0.00	\$38,581,948.81	\$225,662.82	(\$225,662.82)	\$0.00	\$38,581,948.81	\$225,662.82	(\$225,662.82)	\$0.00
9	143	9/1/13	\$0.00	\$0.00	\$0.00	\$0.00	\$38,808,939.28	\$226,990.47	(\$226,990.47)	\$0.00	\$38,808,939.28	\$226,990.47	(\$226,990.47)	\$0.00
9	144	10/1/13	\$0.00	\$0.00	\$0.00	\$0.00	\$39,037,265.21	\$228,325.93	(\$228,325.93)	\$0.00	\$39,037,265.21	\$228,325.93	(\$228,325.93)	\$0.00
9	145	11/1/13	\$0.00	\$0.00	\$0.00	\$0.00	\$39,266,934.45	\$229,669.24	(\$229,669.24)	\$0.00	\$39,266,934.45	\$229,669.24	(\$229,669.24)	\$0.00
9	146	12/1/13	\$0.00	\$0.00	\$0.00	\$0.00	\$39,497,954.91	\$231,020.46	(\$231,020.46)	\$0.00	\$39,497,954.91	\$231,020.46	(\$231,020.46)	\$0.00
10	147	1/1/14	\$0.00	\$0.00	\$0.00	\$0.00	\$34,217,850.12	\$232,379.63	\$5,280,104.79	\$5,512,484.43	\$34,217,850.12	\$232,379.63	\$5,280,104.79	\$5,512,484.43
10	148	2/1/14	\$0.00	\$0.00	\$0.00	\$0.00	\$34,419,165.14	\$201,315.02	(\$201,315.02)	\$0.00	\$34,419,165.14	\$201,315.02	(\$201,315.02)	\$0.00
10	149	3/1/14	\$0.00	\$0.00	\$0.00	\$0.00	\$34,621,664.56	\$202,499.42	(\$202,499.42)	\$0.00	\$34,621,664.56	\$202,499.42	(\$202,499.42)	\$0.00
10	150	4/1/14	\$0.00	\$0.00	\$0.00	\$0.00	\$34,825,355.35	\$203,690.79	(\$203,690.79)	\$0.00	\$34,825,355.35	\$203,690.79	(\$203,690.79)	\$0.00
10	151	5/1/14	\$0.00	\$0.00	\$0.00	\$0.00	\$35,030,244.53	\$204,889.17	(\$204,889.17)	\$0.00	\$35,030,244.53	\$204,889.17	(\$204,889.17)	\$0.00
10	152	6/1/14	\$0.00	\$0.00	\$0.00	\$0.00	\$35,236,339.13	\$206,094.61	(\$206,094.61)	\$0.00	\$35,236,339.13	\$206,094.61	(\$206,094.61)	\$0.00
10	153	7/1/14	\$0.00	\$0.00	\$0.00	\$0.00	\$35,443,646.26	\$207,307.13	(\$207,307.13)	\$0.00	\$35,443,646.26	\$207,307.13	(\$207,307.13)	\$0.00
10	154	8/1/14	\$0.00	\$0.00	\$0.00	\$0.00	\$35,652,173.05	\$208,526.79	(\$208,526.79)	\$0.00	\$35,652,173.05	\$208,526.79	(\$208,526.79)	\$0.00
10	155	9/1/14	\$0.00	\$0.00	\$0.00	\$0.00	\$35,861,926.67	\$209,753.62	(\$209,753.62)	\$0.00	\$35,861,926.67	\$209,753.62	(\$209,753.62)	\$0.00
10	156	10/1/14	\$0.00	\$0.00	\$0.00	\$0.00	\$36,072,914.33	\$210,987.67	(\$210,987.67)	\$0.00	\$36,072,914.33	\$210,987.67	(\$210,987.67)	\$0.00
10	157	11/1/14	\$0.00	\$0.00	\$0.00	\$0.00	\$36,285,143.31	\$212,228.98	(\$212,228.98)	\$0.00	\$36,285,143.31	\$212,228.98	(\$212,228.98)	\$0.00
10	158	12/1/14	\$0.00	\$0.00	\$0.00	\$0.00	\$36,498,620.91	\$213,477.59	(\$213,477.59)	\$0.00	\$36,498,620.91	\$213,477.59	(\$213,477.59)	\$0.00
11	159	1/1/15	\$0.00	\$0.00	\$0.00	\$0.00	\$31,129,947.60	\$214,733.55	\$5,368,673.31	\$5,583,406.86	\$31,129,947.60	\$214,733.55	\$5,368,673.31	\$5,583,406.86
11	160	2/1/15	\$0.00	\$0.00	\$0.00	\$0.00	\$31,313,095.46	\$183,147.86	(\$183,147.86)	\$0.00	\$31,313,095.46	\$183,147.86	(\$183,147.86)	\$0.00
11	161	3/1/15	\$0.00	\$0.00	\$0.00	\$0.00	\$31,497,320.84	\$184,225.38	(\$184,225.38)	\$0.00	\$31,497,320.84	\$184,225.38	(\$184,225.38)	\$0.00
11	162	4/1/15	\$0.00	\$0.00	\$0.00	\$0.00	\$31,682,630.07	\$185,309.24	(\$185,309.24)	\$0.00	\$31,682,630.07	\$185,309.24	(\$185,309.24)	\$0.00
11	163	5/1/15	\$0.00	\$0.00	\$0.00	\$0.00	\$31,869,029.55	\$186,399.47	(\$186,399.47)	\$0.00	\$31,869,029.55	\$186,399.47	(\$186,399.47)	\$0.00
11	164	6/1/15	\$0.00	\$0.00	\$0.00	\$0.00	\$32,056,525.67	\$187,496.12	(\$187,496.12)	\$0.00	\$32,056,525.67	\$187,496.12	(\$187,496.12)	\$0.00
11	165	7/1/15	\$0.00	\$0.00	\$0.00	\$0.00	\$32,245,124.90	\$188,599.23	(\$188,599.23)	\$0.00	\$32,245,124.90	\$188,599.23	(\$188,599.23)	\$0.00
11	166	8/1/15	\$0.00	\$0.00	\$0.00	\$0.00	\$32,434,833.72	\$189,708.82	(\$189,708.82)	\$0.00	\$32,434,833.72	\$189,708.82	(\$189,708.82)	\$0.00
11	167	9/1/15	\$0.00	\$0.00	\$0.00	\$0.00	\$32,625,658.65	\$190,824.94	(\$190,824.94)	\$0.00	\$32,625,658.65	\$190,824.94	(\$190,824.94)	\$0.00
11	168	10/1/15	\$0.00	\$0.00	\$0.00	\$0.00	\$32,817,606.28	\$191,947.63	(\$191,947.63)	\$0.00	\$32,817,606.28	\$191,947.63	(\$191,947.63)	\$0.00
11	169	11/1/15	\$0.00	\$0.00	\$0.00	\$0.00	\$33,010,683.20	\$193,076.92	(\$193,076.92)	\$0.00	\$33,010,683.20	\$193,076.92	(\$193,076.92)	\$0.00
11	170	12/1/15	\$0.00	\$0.00	\$0.00	\$0.00	\$33,204,896.05	\$194,212.85	(\$194,212.85)	\$0.00	\$33,204,896.05	\$194,212.85	(\$194,212.85)	\$0.00
12	171	1/1/16	\$0.00	\$0.00	\$0.00	\$0.00	\$27,746,233.39	\$195,355.47	\$5,458,662.66	\$5,654,018.13	\$27,746,233.39	\$195,355.47	\$5,458,662.66	\$5,654,018.13
12	172	2/1/16	\$0.00	\$0.00	\$0.00	\$0.00	\$27,909,473.73	\$163,240.34	(\$163,240.34)	\$0.00	\$27,909,473.73	\$163,240.34	(\$163,240.34)	\$0.00
12	173	3/1/16	\$0.00	\$0.00	\$0.00	\$0.00	\$28,073,674.47	\$164,200.74	(\$164,200.74)	\$0.00	\$28,073,674.47	\$164,200.74	(\$164,200.74)	\$0.00
12	174	4/1/16	\$0.00	\$0.00	\$0.00	\$0.00	\$28,238,841.25	\$165,166.78	(\$165,166.78)	\$0.00	\$28,238,841.25	\$165,166.78	(\$165,166.78)	\$0.00
12	175	5/1/16	\$0.00	\$0.00	\$0.00	\$0.00	\$28,404,979.77	\$166,138.52	(\$166,138.52)	\$0.00	\$28,404,979.77	\$166,138.52	(\$166,138.52)	\$0.00
12	176	6/1/16	\$0.00	\$0.00	\$0.00	\$0.00	\$28,572,095.73	\$167,115.96	(\$167,115.96)	\$0.00	\$28,572,095.73	\$167,115.96	(\$167,115.96)	\$0.00
12	177	7/1/16	\$0.00	\$0.00	\$0.00	\$0.00	\$28,740,194.89	\$168,099.16	(\$168,099.16)	\$0.00	\$28,740,194.89	\$168,099.16	(\$168,099.16)	\$0.00
12	178	8/1/16	\$0.00	\$0.00	\$0.00	\$0.00	\$28,909,283.04	\$169,088.15	(\$169,088.15)	\$0.00	\$28,909,283.04	\$169,088.15	(\$169,088.15)	\$0.00
12	179	9/1/16	\$0.00	\$0.00	\$0.00	\$0.00	\$29,079,365.99	\$170,082.95	(\$170,082.95)	\$0.00	\$29,079,365.99	\$170,082.95	(\$170,082.95)	\$0.00
12	180	10/1/16	\$0.00	\$0.00	\$0.00	\$0.00	\$29,250,449.59	\$171,083.60	(\$171,083.60)	\$0.00	\$29,250,449.59	\$171,083.60	(\$171,083.60)	\$0.00
12	181	11/1/16	\$0.00	\$0.00	\$0.00	\$0.00	\$29,422,539.74	\$172,090.15	(\$172,090.15)	\$0.00	\$29,422,539.74	\$172,090.15	(\$172,090.15)	\$0.00
12	182	12/1/16	\$0.00	\$0.00	\$0.00	\$0.00	\$29,595,642.35	\$173,102.61	(\$173,102.61)	\$0.00	\$29,595,642.35	\$173,102.61	(\$173,102.61)	\$0.00

13	183	1/1/17	\$0.00	\$0.00	\$0.00	\$0.00	\$24,069,270.01	\$174,121.03	\$5,526,372.34	\$5,700,493.37	\$24,069,270.01	\$174,121.03	\$5,526,372.34	\$5,700,493.37
13	184	2/1/17	\$0.00	\$0.00	\$0.00	\$0.00	\$24,210,877.55	\$141,607.54	(\$141,607.54)	\$0.00	\$24,210,877.55	\$141,607.54	(\$141,607.54)	\$0.00
13	185	3/1/17	\$0.00	\$0.00	\$0.00	\$0.00	\$24,353,318.21	\$142,440.66	(\$142,440.66)	\$0.00	\$24,353,318.21	\$142,440.66	(\$142,440.66)	\$0.00
13	186	4/1/17	\$0.00	\$0.00	\$0.00	\$0.00	\$24,496,596.90	\$143,278.69	(\$143,278.69)	\$0.00	\$24,496,596.90	\$143,278.69	(\$143,278.69)	\$0.00
13	187	5/1/17	\$0.00	\$0.00	\$0.00	\$0.00	\$24,640,718.55	\$144,121.65	(\$144,121.65)	\$0.00	\$24,640,718.55	\$144,121.65	(\$144,121.65)	\$0.00
13	188	6/1/17	\$0.00	\$0.00	\$0.00	\$0.00	\$24,785,688.11	\$144,969.56	(\$144,969.56)	\$0.00	\$24,785,688.11	\$144,969.56	(\$144,969.56)	\$0.00
13	189	7/1/17	\$0.00	\$0.00	\$0.00	\$0.00	\$24,931,510.57	\$145,822.47	(\$145,822.47)	\$0.00	\$24,931,510.57	\$145,822.47	(\$145,822.47)	\$0.00
13	190	8/1/17	\$0.00	\$0.00	\$0.00	\$0.00	\$25,078,190.96	\$146,680.39	(\$146,680.39)	\$0.00	\$25,078,190.96	\$146,680.39	(\$146,680.39)	\$0.00
13	191	9/1/17	\$0.00	\$0.00	\$0.00	\$0.00	\$25,225,734.32	\$147,543.36	(\$147,543.36)	\$0.00	\$25,225,734.32	\$147,543.36	(\$147,543.36)	\$0.00
13	192	10/1/17	\$0.00	\$0.00	\$0.00	\$0.00	\$25,374,145.72	\$148,411.40	(\$148,411.40)	\$0.00	\$25,374,145.72	\$148,411.40	(\$148,411.40)	\$0.00
13	193	11/1/17	\$0.00	\$0.00	\$0.00	\$0.00	\$25,523,430.28	\$149,284.56	(\$149,284.56)	\$0.00	\$25,523,430.28	\$149,284.56	(\$149,284.56)	\$0.00
13	194	12/1/17	\$0.00	\$0.00	\$0.00	\$0.00	\$25,673,593.12	\$150,162.85	(\$150,162.85)	\$0.00	\$25,673,593.12	\$150,162.85	(\$150,162.85)	\$0.00
14	195	1/1/18	\$0.00	\$0.00	\$0.00	\$0.00	\$20,030,633.02	\$151,046.31	\$5,642,960.11	\$5,794,006.41	\$20,030,633.02	\$151,046.31	\$5,642,960.11	\$5,794,006.41
14	196	2/1/18	\$0.00	\$0.00	\$0.00	\$0.00	\$20,148,479.91	\$117,846.89	(\$117,846.89)	\$0.00	\$20,148,479.91	\$117,846.89	(\$117,846.89)	\$0.00
14	197	3/1/18	\$0.00	\$0.00	\$0.00	\$0.00	\$20,267,020.13	\$118,540.22	(\$118,540.22)	\$0.00	\$20,267,020.13	\$118,540.22	(\$118,540.22)	\$0.00
14	198	4/1/18	\$0.00	\$0.00	\$0.00	\$0.00	\$20,386,257.77	\$119,237.64	(\$119,237.64)	\$0.00	\$20,386,257.77	\$119,237.64	(\$119,237.64)	\$0.00
14	199	5/1/18	\$0.00	\$0.00	\$0.00	\$0.00	\$20,506,196.92	\$119,939.15	(\$119,939.15)	\$0.00	\$20,506,196.92	\$119,939.15	(\$119,939.15)	\$0.00
14	200	6/1/18	\$0.00	\$0.00	\$0.00	\$0.00	\$20,626,841.71	\$120,644.79	(\$120,644.79)	\$0.00	\$20,626,841.71	\$120,644.79	(\$120,644.79)	\$0.00
14	201	7/1/18	\$0.00	\$0.00	\$0.00	\$0.00	\$20,748,196.29	\$121,354.59	(\$121,354.59)	\$0.00	\$20,748,196.29	\$121,354.59	(\$121,354.59)	\$0.00
14	202	8/1/18	\$0.00	\$0.00	\$0.00	\$0.00	\$20,870,264.85	\$122,068.55	(\$122,068.55)	\$0.00	\$20,870,264.85	\$122,068.55	(\$122,068.55)	\$0.00
14	203	9/1/18	\$0.00	\$0.00	\$0.00	\$0.00	\$20,993,051.57	\$122,786.72	(\$122,786.72)	\$0.00	\$20,993,051.57	\$122,786.72	(\$122,786.72)	\$0.00
14	204	10/1/18	\$0.00	\$0.00	\$0.00	\$0.00	\$21,116,560.69	\$123,509.12	(\$123,509.12)	\$0.00	\$21,116,560.69	\$123,509.12	(\$123,509.12)	\$0.00
14	205	11/1/18	\$0.00	\$0.00	\$0.00	\$0.00	\$21,240,796.46	\$124,235.77	(\$124,235.77)	\$0.00	\$21,240,796.46	\$124,235.77	(\$124,235.77)	\$0.00
14	206	12/1/18	\$0.00	\$0.00	\$0.00	\$0.00	\$21,365,763.15	\$124,966.69	(\$124,966.69)	\$0.00	\$21,365,763.15	\$124,966.69	(\$124,966.69)	\$0.00
15	207	1/1/19	\$0.00	\$0.00	\$0.00	\$0.00	\$15,628,246.35	\$125,701.91	\$5,737,516.80	\$5,863,218.70	\$15,628,246.35	\$125,701.91	\$5,737,516.80	\$5,863,218.70
15	208	2/1/19	\$0.00	\$0.00	\$0.00	\$0.00	\$15,720,192.53	\$91,946.18	(\$91,946.18)	\$0.00	\$15,720,192.53	\$91,946.18	(\$91,946.18)	\$0.00
15	209	3/1/19	\$0.00	\$0.00	\$0.00	\$0.00	\$15,812,679.66	\$92,487.13	(\$92,487.13)	\$0.00	\$15,812,679.66	\$92,487.13	(\$92,487.13)	\$0.00
15	210	4/1/19	\$0.00	\$0.00	\$0.00	\$0.00	\$15,905,710.93	\$93,031.27	(\$93,031.27)	\$0.00	\$15,905,710.93	\$93,031.27	(\$93,031.27)	\$0.00
15	211	5/1/19	\$0.00	\$0.00	\$0.00	\$0.00	\$15,999,289.53	\$93,578.60	(\$93,578.60)	\$0.00	\$15,999,289.53	\$93,578.60	(\$93,578.60)	\$0.00
15	212	6/1/19	\$0.00	\$0.00	\$0.00	\$0.00	\$16,093,418.68	\$94,129.15	(\$94,129.15)	\$0.00	\$16,093,418.68	\$94,129.15	(\$94,129.15)	\$0.00
15	213	7/1/19	\$0.00	\$0.00	\$0.00	\$0.00	\$16,188,101.63	\$94,682.95	(\$94,682.95)	\$0.00	\$16,188,101.63	\$94,682.95	(\$94,682.95)	\$0.00
15	214	8/1/19	\$0.00	\$0.00	\$0.00	\$0.00	\$16,283,341.63	\$95,240.00	(\$95,240.00)	\$0.00	\$16,283,341.63	\$95,240.00	(\$95,240.00)	\$0.00
15	215	9/1/19	\$0.00	\$0.00	\$0.00	\$0.00	\$16,379,141.95	\$95,800.33	(\$95,800.33)	\$0.00	\$16,379,141.95	\$95,800.33	(\$95,800.33)	\$0.00
15	216	10/1/19	\$0.00	\$0.00	\$0.00	\$0.00	\$16,475,505.91	\$96,363.95	(\$96,363.95)	\$0.00	\$16,475,505.91	\$96,363.95	(\$96,363.95)	\$0.00
15	217	11/1/19	\$0.00	\$0.00	\$0.00	\$0.00	\$16,572,436.80	\$96,930.89	(\$96,930.89)	\$0.00	\$16,572,436.80	\$96,930.89	(\$96,930.89)	\$0.00
15	218	12/1/19	\$0.00	\$0.00	\$0.00	\$0.00	\$16,669,937.97	\$97,501.17	(\$97,501.17)	\$0.00	\$16,669,937.97	\$97,501.17	(\$97,501.17)	\$0.00
16	219	1/1/20	\$0.00	\$0.00	\$0.00	\$0.00	\$10,836,220.61	\$98,074.80	\$5,833,717.36	\$5,931,792.16	\$10,836,220.61	\$98,074.80	\$5,833,717.36	\$5,931,792.16
16	220	2/1/20	\$0.00	\$0.00	\$0.00	\$0.00	\$10,899,973.71	\$63,753.10	(\$63,753.10)	\$0.00	\$10,899,973.71	\$63,753.10	(\$63,753.10)	\$0.00
16	221	3/1/20	\$0.00	\$0.00	\$0.00	\$0.00	\$10,964,101.89	\$64,128.18	(\$64,128.18)	\$0.00	\$10,964,101.89	\$64,128.18	(\$64,128.18)	\$0.00
16	222	4/1/20	\$0.00	\$0.00	\$0.00	\$0.00	\$11,028,607.36	\$64,505.47	(\$64,505.47)	\$0.00	\$11,028,607.36	\$64,505.47	(\$64,505.47)	\$0.00
16	223	5/1/20	\$0.00	\$0.00	\$0.00	\$0.00	\$11,093,492.33	\$64,884.97	(\$64,884.97)	\$0.00	\$11,093,492.33	\$64,884.97	(\$64,884.97)	\$0.00
16	224	6/1/20	\$0.00	\$0.00	\$0.00	\$0.00	\$11,158,759.04	\$65,266.71	(\$65,266.71)	\$0.00	\$11,158,759.04	\$65,266.71	(\$65,266.71)	\$0.00
16	225	7/1/20	\$0.00	\$0.00	\$0.00	\$0.00	\$11,224,409.74	\$65,650.70	(\$65,650.70)	\$0.00	\$11,224,409.74	\$65,650.70	(\$65,650.70)	\$0.00
16	226	8/1/20	\$0.00	\$0.00	\$0.00	\$0.00	\$11,290,446.69	\$66,036.94	(\$66,036.94)	\$0.00	\$11,290,446.69	\$66,036.94	(\$66,036.94)	\$0.00
16	227	9/1/20	\$0.00	\$0.00	\$0.00	\$0.00	\$11,356,872.15	\$66,425.46	(\$66,425.46)	\$0.00	\$11,356,872.15	\$66,425.46	(\$66,425.46)	\$0.00
16	228	10/1/20	\$0.00	\$0.00	\$0.00	\$0.00	\$11,423,688.41	\$66,816.26	(\$66,816.26)	\$0.00	\$11,423,688.41	\$66,816.26	(\$66,816.26)	\$0.00
16	229	11/1/20	\$0.00	\$0.00	\$0.00	\$0.00	\$11,490,897.78	\$67,209.37	(\$67,209.37)	\$0.00	\$11,490,897.78	\$67,209.37	(\$67,209.37)	\$0.00
16	230	12/1/20	\$0.00	\$0.00	\$0.00	\$0.00	\$11,558,502.56	\$67,604.78	(\$67,604.78)	\$0.00	\$11,558,502.56	\$67,604.78	(\$67,604.78)	\$0.00

17	231	1/1/21	\$0.00	\$0.00	\$0.00	\$0.00	\$5,654,084.02	\$68,002.52	\$5,904,418.54	\$5,972,421.06	\$5,654,084.02	\$68,002.52	\$5,904,418.54	\$5,972,421.06
17	232	2/1/21	\$0.00	\$0.00	\$0.00	\$0.00	\$5,687,348.88	\$33,264.86	(\$33,264.86)	\$0.00	\$5,687,348.88	\$33,264.86	(\$33,264.86)	\$0.00
17	233	3/1/21	\$0.00	\$0.00	\$0.00	\$0.00	\$5,720,809.45	\$33,460.57	(\$33,460.57)	\$0.00	\$5,720,809.45	\$33,460.57	(\$33,460.57)	\$0.00
17	234	4/1/21	\$0.00	\$0.00	\$0.00	\$0.00	\$5,754,466.88	\$33,657.43	(\$33,657.43)	\$0.00	\$5,754,466.88	\$33,657.43	(\$33,657.43)	\$0.00
17	235	5/1/21	\$0.00	\$0.00	\$0.00	\$0.00	\$5,788,322.32	\$33,855.45	(\$33,855.45)	\$0.00	\$5,788,322.32	\$33,855.45	(\$33,855.45)	\$0.00
17	236	6/1/21	\$0.00	\$0.00	\$0.00	\$0.00	\$5,822,376.95	\$34,054.63	(\$34,054.63)	\$0.00	\$5,822,376.95	\$34,054.63	(\$34,054.63)	\$0.00
17	237	7/1/21	\$0.00	\$0.00	\$0.00	\$0.00	\$5,856,631.94	\$34,254.98	(\$34,254.98)	\$0.00	\$5,856,631.94	\$34,254.98	(\$34,254.98)	\$0.00
17	238	8/1/21	\$0.00	\$0.00	\$0.00	\$0.00	\$5,891,088.46	\$34,456.52	(\$34,456.52)	\$0.00	\$5,891,088.46	\$34,456.52	(\$34,456.52)	\$0.00
17	239	9/1/21	\$0.00	\$0.00	\$0.00	\$0.00	\$5,925,747.69	\$34,659.24	(\$34,659.24)	\$0.00	\$5,925,747.69	\$34,659.24	(\$34,659.24)	\$0.00
17	240	10/1/21	\$0.00	\$0.00	\$0.00	\$0.00	\$5,960,610.84	\$34,863.15	(\$34,863.15)	\$0.00	\$5,960,610.84	\$34,863.15	(\$34,863.15)	\$0.00
17	241	11/1/21	\$0.00	\$0.00	\$0.00	\$0.00	\$5,995,679.10	\$35,068.26	(\$35,068.26)	\$0.00	\$5,995,679.10	\$35,068.26	(\$35,068.26)	\$0.00
17	242	12/1/21	\$0.00	\$0.00	\$0.00	\$0.00	\$6,030,953.68	\$35,274.58	(\$35,274.58)	\$0.00	\$6,030,953.68	\$35,274.58	(\$35,274.58)	\$0.00
18	243	1/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$35,482.11	\$6,030,953.68	\$6,066,435.79	\$0.00	\$35,482.11	\$6,030,953.68	\$6,066,435.79
18	244	2/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
18	245	3/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
18	246	4/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
18	247	5/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
18	248	6/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
18	249	7/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
18	250	8/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
18	251	9/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
18	252	10/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
18	253	11/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
18	254	12/1/22	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

Note: Opening Balance reflects 30 days of interest accumulated from end of construction period.

Performance Period Payment Schedule - Expense Service Component

Year	Period	Date	Project 2	Project 3	Project 2(mod)
			Expenses	Expenses	Total Expenses
1	39	1/1/05	\$644,433.37	\$962,630.00	\$1,607,063.37
1	40	2/1/05	\$0.00	\$0.00	\$0.00
1	41	3/1/05	\$0.00	\$0.00	\$0.00
1	42	4/1/05	\$0.00	\$0.00	\$0.00
1	43	5/1/05	\$0.00	\$0.00	\$0.00
1	44	6/1/05	\$0.00	\$0.00	\$0.00
1	45	7/1/05	\$0.00	\$0.00	\$0.00
1	46	8/1/05	\$0.00	\$0.00	\$0.00
1	47	9/1/05	\$0.00	\$0.00	\$0.00
1	48	10/1/05	\$0.00	\$0.00	\$0.00
1	49	11/1/05	\$0.00	\$0.00	\$0.00
1	50	12/1/05	\$0.00	\$0.00	\$0.00
2	51	1/1/06	\$666,910.99	\$995,937.00	\$1,662,847.99
2	52	2/1/06	\$0.00	\$0.00	\$0.00
2	53	3/1/06	\$0.00	\$0.00	\$0.00
2	54	4/1/06	\$0.00	\$0.00	\$0.00
2	55	5/1/06	\$0.00	\$0.00	\$0.00
2	56	6/1/06	\$0.00	\$0.00	\$0.00
2	57	7/1/06	\$0.00	\$0.00	\$0.00
2	58	8/1/06	\$0.00	\$0.00	\$0.00
2	59	9/1/06	\$0.00	\$0.00	\$0.00
2	60	10/1/06	\$0.00	\$0.00	\$0.00
2	61	11/1/06	\$0.00	\$0.00	\$0.00
2	62	12/1/06	\$0.00	\$0.00	\$0.00
3	63	1/1/07	\$691,556.01	\$1,030,398.00	\$1,721,954.01
3	64	2/1/07	\$0.00	\$0.00	\$0.00
3	65	3/1/07	\$0.00	\$0.00	\$0.00
3	66	4/1/07	\$0.00	\$0.00	\$0.00
3	67	5/1/07	\$0.00	\$0.00	\$0.00
3	68	6/1/07	\$0.00	\$0.00	\$0.00
3	69	7/1/07	\$0.00	\$0.00	\$0.00
3	70	8/1/07	\$0.00	\$0.00	\$0.00
3	71	9/1/07	\$0.00	\$0.00	\$0.00
3	72	10/1/07	\$0.00	\$0.00	\$0.00
3	73	11/1/07	\$0.00	\$0.00	\$0.00
3	74	12/1/07	\$0.00	\$0.00	\$0.00
4	75	1/1/08	\$717,067.82	\$1,050,172.00	\$1,767,239.82
4	76	2/1/08	\$0.00	\$0.00	\$0.00
4	77	3/1/08	\$0.00	\$0.00	\$0.00
4	78	4/1/08	\$0.00	\$0.00	\$0.00
4	79	5/1/08	\$0.00	\$0.00	\$0.00
4	80	6/1/08	\$0.00	\$0.00	\$0.00
4	81	7/1/08	\$0.00	\$0.00	\$0.00
4	82	8/1/08	\$0.00	\$0.00	\$0.00
4	83	9/1/08	\$0.00	\$0.00	\$0.00
4	84	10/1/08	\$0.00	\$0.00	\$0.00
4	85	11/1/08	\$0.00	\$0.00	\$0.00
4	86	12/1/08	\$0.00	\$0.00	\$0.00

5	87	1/1/09	\$742,093.48	\$1,086,508.00	\$1,828,601.48
5	88	2/1/09	\$0.00	\$0.00	\$0.00
5	89	3/1/09	\$0.00	\$0.00	\$0.00
5	90	4/1/09	\$0.00	\$0.00	\$0.00
5	91	5/1/09	\$0.00	\$0.00	\$0.00
5	92	6/1/09	\$0.00	\$0.00	\$0.00
5	93	7/1/09	\$0.00	\$0.00	\$0.00
5	94	8/1/09	\$0.00	\$0.00	\$0.00
5	95	9/1/09	\$0.00	\$0.00	\$0.00
5	96	10/1/09	\$0.00	\$0.00	\$0.00
5	97	11/1/09	\$0.00	\$0.00	\$0.00
5	98	12/1/09	\$0.00	\$0.00	\$0.00
6	99	1/1/10	\$767,992.54	\$1,124,100.00	\$1,892,092.54
6	100	2/1/10	\$0.00	\$0.00	\$0.00
6	101	3/1/10	\$0.00	\$0.00	\$0.00
6	102	4/1/10	\$0.00	\$0.00	\$0.00
6	103	5/1/10	\$0.00	\$0.00	\$0.00
6	104	6/1/10	\$0.00	\$0.00	\$0.00
6	105	7/1/10	\$0.00	\$0.00	\$0.00
6	106	8/1/10	\$0.00	\$0.00	\$0.00
6	107	9/1/10	\$0.00	\$0.00	\$0.00
6	108	10/1/10	\$0.00	\$0.00	\$0.00
6	109	11/1/10	\$0.00	\$0.00	\$0.00
6	110	12/1/10	\$0.00	\$0.00	\$0.00
7	111	1/1/11	\$794,795.48	\$1,162,995.00	\$1,957,790.48
7	112	2/1/11	\$0.00	\$0.00	\$0.00
7	113	3/1/11	\$0.00	\$0.00	\$0.00
7	114	4/1/11	\$0.00	\$0.00	\$0.00
7	115	5/1/11	\$0.00	\$0.00	\$0.00
7	116	6/1/11	\$0.00	\$0.00	\$0.00
7	117	7/1/11	\$0.00	\$0.00	\$0.00
7	118	8/1/11	\$0.00	\$0.00	\$0.00
7	119	9/1/11	\$0.00	\$0.00	\$0.00
7	120	10/1/11	\$0.00	\$0.00	\$0.00
7	121	11/1/11	\$0.00	\$0.00	\$0.00
7	122	12/1/11	\$0.00	\$0.00	\$0.00
8	123	1/1/12	\$822,533.84	\$1,203,234.00	\$2,025,767.84
8	124	2/1/12	\$0.00	\$0.00	\$0.00
8	125	3/1/12	\$0.00	\$0.00	\$0.00
8	126	4/1/12	\$0.00	\$0.00	\$0.00
8	127	5/1/12	\$0.00	\$0.00	\$0.00
8	128	6/1/12	\$0.00	\$0.00	\$0.00
8	129	7/1/12	\$0.00	\$0.00	\$0.00
8	130	8/1/12	\$0.00	\$0.00	\$0.00
8	131	9/1/12	\$0.00	\$0.00	\$0.00
8	132	10/1/12	\$0.00	\$0.00	\$0.00
8	133	11/1/12	\$0.00	\$0.00	\$0.00
8	134	12/1/12	\$0.00	\$0.00	\$0.00

9	135	1/1/13	\$851,240.26	\$1,265,595.00	\$2,116,835.26
9	136	2/1/13	\$0.00	\$0.00	\$0.00
9	137	3/1/13	\$0.00	\$0.00	\$0.00
9	138	4/1/13	\$0.00	\$0.00	\$0.00
9	139	5/1/13	\$0.00	\$0.00	\$0.00
9	140	6/1/13	\$0.00	\$0.00	\$0.00
9	141	7/1/13	\$0.00	\$0.00	\$0.00
9	142	8/1/13	\$0.00	\$0.00	\$0.00
9	143	9/1/13	\$0.00	\$0.00	\$0.00
9	144	10/1/13	\$0.00	\$0.00	\$0.00
9	145	11/1/13	\$0.00	\$0.00	\$0.00
9	146	12/1/13	\$0.00	\$0.00	\$0.00
10	147	1/1/14	\$880,948.55	\$1,287,936.00	\$2,168,884.55
10	148	2/1/14	\$0.00	\$0.00	\$0.00
10	149	3/1/14	\$0.00	\$0.00	\$0.00
10	150	4/1/14	\$0.00	\$0.00	\$0.00
10	151	5/1/14	\$0.00	\$0.00	\$0.00
10	152	6/1/14	\$0.00	\$0.00	\$0.00
10	153	7/1/14	\$0.00	\$0.00	\$0.00
10	154	8/1/14	\$0.00	\$0.00	\$0.00
10	155	9/1/14	\$0.00	\$0.00	\$0.00
10	156	10/1/14	\$0.00	\$0.00	\$0.00
10	157	11/1/14	\$0.00	\$0.00	\$0.00
10	158	12/1/14	\$0.00	\$0.00	\$0.00
11	159	1/1/15	\$911,693.65	\$1,332,499.00	\$2,244,192.65
11	160	2/1/15	\$0.00	\$0.00	\$0.00
11	161	3/1/15	\$0.00	\$0.00	\$0.00
11	162	4/1/15	\$0.00	\$0.00	\$0.00
11	163	5/1/15	\$0.00	\$0.00	\$0.00
11	164	6/1/15	\$0.00	\$0.00	\$0.00
11	165	7/1/15	\$0.00	\$0.00	\$0.00
11	166	8/1/15	\$0.00	\$0.00	\$0.00
11	167	9/1/15	\$0.00	\$0.00	\$0.00
11	168	10/1/15	\$0.00	\$0.00	\$0.00
11	169	11/1/15	\$0.00	\$0.00	\$0.00
11	170	12/1/15	\$0.00	\$0.00	\$0.00
12	171	1/1/16	\$943,511.75	\$1,378,604.00	\$2,322,115.75
12	172	2/1/16	\$0.00	\$0.00	\$0.00
12	173	3/1/16	\$0.00	\$0.00	\$0.00
12	174	4/1/16	\$0.00	\$0.00	\$0.00
12	175	5/1/16	\$0.00	\$0.00	\$0.00
12	176	6/1/16	\$0.00	\$0.00	\$0.00
12	177	7/1/16	\$0.00	\$0.00	\$0.00
12	178	8/1/16	\$0.00	\$0.00	\$0.00
12	179	9/1/16	\$0.00	\$0.00	\$0.00
12	180	10/1/16	\$0.00	\$0.00	\$0.00
12	181	11/1/16	\$0.00	\$0.00	\$0.00
12	182	12/1/16	\$0.00	\$0.00	\$0.00

13	183	1/1/17	\$976,440.32	\$1,450,054.00	\$2,426,494.32
13	184	2/1/17	\$0.00	\$0.00	\$0.00
13	185	3/1/17	\$0.00	\$0.00	\$0.00
13	186	4/1/17	\$0.00	\$0.00	\$0.00
13	187	5/1/17	\$0.00	\$0.00	\$0.00
13	188	6/1/17	\$0.00	\$0.00	\$0.00
13	189	7/1/17	\$0.00	\$0.00	\$0.00
13	190	8/1/17	\$0.00	\$0.00	\$0.00
13	191	9/1/17	\$0.00	\$0.00	\$0.00
13	192	10/1/17	\$0.00	\$0.00	\$0.00
13	193	11/1/17	\$0.00	\$0.00	\$0.00
13	194	12/1/17	\$0.00	\$0.00	\$0.00
14	195	1/1/18	\$1,010,518.08	\$1,475,651.00	\$2,486,169.08
14	196	2/1/18	\$0.00	\$0.00	\$0.00
14	197	3/1/18	\$0.00	\$0.00	\$0.00
14	198	4/1/18	\$0.00	\$0.00	\$0.00
14	199	5/1/18	\$0.00	\$0.00	\$0.00
14	200	6/1/18	\$0.00	\$0.00	\$0.00
14	201	7/1/18	\$0.00	\$0.00	\$0.00
14	202	8/1/18	\$0.00	\$0.00	\$0.00
14	203	9/1/18	\$0.00	\$0.00	\$0.00
14	204	10/1/18	\$0.00	\$0.00	\$0.00
14	205	11/1/18	\$0.00	\$0.00	\$0.00
14	206	12/1/18	\$0.00	\$0.00	\$0.00
15	207	1/1/19	\$1,045,785.17	\$1,526,707.00	\$2,572,492.17
15	208	2/1/19	\$0.00	\$0.00	\$0.00
15	209	3/1/19	\$0.00	\$0.00	\$0.00
15	210	4/1/19	\$0.00	\$0.00	\$0.00
15	211	5/1/19	\$0.00	\$0.00	\$0.00
15	212	6/1/19	\$0.00	\$0.00	\$0.00
15	213	7/1/19	\$0.00	\$0.00	\$0.00
15	214	8/1/19	\$0.00	\$0.00	\$0.00
15	215	9/1/19	\$0.00	\$0.00	\$0.00
15	216	10/1/19	\$0.00	\$0.00	\$0.00
15	217	11/1/19	\$0.00	\$0.00	\$0.00
15	218	12/1/19	\$0.00	\$0.00	\$0.00
16	219	1/1/20	\$1,082,283.08	\$1,579,531.00	\$2,661,814.08
16	220	2/1/20	\$0.00	\$0.00	\$0.00
16	221	3/1/20	\$0.00	\$0.00	\$0.00
16	222	4/1/20	\$0.00	\$0.00	\$0.00
16	223	5/1/20	\$0.00	\$0.00	\$0.00
16	224	6/1/20	\$0.00	\$0.00	\$0.00
16	225	7/1/20	\$0.00	\$0.00	\$0.00
16	226	8/1/20	\$0.00	\$0.00	\$0.00
16	227	9/1/20	\$0.00	\$0.00	\$0.00
16	228	10/1/20	\$0.00	\$0.00	\$0.00
16	229	11/1/20	\$0.00	\$0.00	\$0.00
16	230	12/1/20	\$0.00	\$0.00	\$0.00

17	231	1/1/21	\$1,120,054.77	\$1,661,397.00	\$2,781,451.77
17	232	2/1/21	\$0.00	\$0.00	\$0.00
17	233	3/1/21	\$0.00	\$0.00	\$0.00
17	234	4/1/21	\$0.00	\$0.00	\$0.00
17	235	5/1/21	\$0.00	\$0.00	\$0.00
17	236	6/1/21	\$0.00	\$0.00	\$0.00
17	237	7/1/21	\$0.00	\$0.00	\$0.00
17	238	8/1/21	\$0.00	\$0.00	\$0.00
17	239	9/1/21	\$0.00	\$0.00	\$0.00
17	240	10/1/21	\$0.00	\$0.00	\$0.00
17	241	11/1/21	\$0.00	\$0.00	\$0.00
17	242	12/1/21	\$0.00	\$0.00	\$0.00
18	243	1/1/22	\$1,159,144.68	\$1,690,727.00	\$2,849,871.68
18	244	2/1/22	\$0.00	\$0.00	\$0.00
18	245	3/1/22	\$0.00	\$0.00	\$0.00
18	246	4/1/22	\$0.00	\$0.00	\$0.00
18	247	5/1/22	\$0.00	\$0.00	\$0.00
18	248	6/1/22	\$0.00	\$0.00	\$0.00
18	249	7/1/22	\$0.00	\$0.00	\$0.00
18	250	8/1/22	\$0.00	\$0.00	\$0.00
18	251	9/1/22	\$0.00	\$0.00	\$0.00
18	252	10/1/22	\$0.00	\$0.00	\$0.00
18	253	11/1/22	\$0.00	\$0.00	\$0.00
18	254	12/1/22	\$0.00	\$0.00	\$0.00

Performance Period Expense Detail

	Contract Year of Project 2 (mod), (Based on Cogeneration Project Award Date)									
	2	3	4	5	6	7	8	9	10	11
Start Date	1-Oct-02	1-Oct-03	1-Oct-04	1-Oct-05	1-Oct-06	1-Oct-07	1-Oct-08	1-Oct-09	1-Oct-10	1-Oct-11
End Date	30-Sep-03	30-Sep-04	30-Sep-05	30-Sep-06	30-Sep-07	30-Sep-08	30-Sep-09	30-Sep-10	30-Sep-11	30-Sep-12
	Performance Year Project 2 and 3 Combined									
		1	2	3	4	5	6	7	8	
Start Date		1-Jan-05	1-Jan-06	1-Jan-07	1-Jan-08	1-Jan-09	1-Jan-10	1-Jan-11	1-Jan-12	
End Date		31-Dec-05	31-Dec-06	31-Dec-07	31-Dec-08	31-Dec-09	31-Dec-10	31-Dec-11	31-Dec-12	
	Project 2 Operational Year									
Year	1	2	3	4	5	6	7	8	9	10
Start Date	1-Jul-03	1-Jan-04	1-Jan-05	1-Jan-06	1-Jan-07	1-Jan-08	1-Jan-09	1-Jan-10	1-Jan-11	1-Jan-12
End Date	31-Dec-03	31-Dec-04	31-Dec-05	31-Dec-06	31-Dec-07	31-Dec-08	31-Dec-09	31-Dec-10	31-Dec-11	31-Dec-12

H-3 Performance Period Expenses

Project 2 Components

Management/Administration (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Operation (\$)	\$ 98,059.48	\$ 111,574.49	\$ 27,501.42	\$ 28,460.67	\$ 29,453.66	\$ 30,481.59	\$ 31,545.40	\$ 32,646.33	\$ 33,785.69	\$ 34,964.81
Maintenance (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Repair and Replacement (\$)	\$ 209,500.00	\$ 426,307.28	\$ 441,176.72	\$ 456,564.80	\$ 472,493.85	\$ 488,984.39	\$ 506,049.94	\$ 523,711.08	\$ 541,988.60	\$ 560,904.00
Measurement and Verification (\$)	\$ 17,456.00	\$ 35,520.86	\$ 36,759.82	\$ 38,041.98	\$ 39,369.26	\$ 40,743.25	\$ 42,165.19	\$ 43,636.76	\$ 45,159.68	\$ 46,735.75
Project 2 subtotal	\$ 325,015.48	\$ 573,402.63	\$ 505,437.96	\$ 523,067.45	\$ 541,316.77	\$ 560,209.23	\$ 579,760.53	\$ 599,994.17	\$ 620,933.97	\$ 642,604.56
Project 2 Markup (@28%)	\$ 91,004.33	\$ 160,552.74	\$ 141,522.63	\$ 146,458.89	\$ 151,568.69	\$ 156,858.59	\$ 162,332.95	\$ 167,998.37	\$ 173,861.51	\$ 179,929.28
Project 2 Negotiated Price Adjustment	\$ (1,625.31)	\$ (2,867.37)	\$ (2,527.22)	\$ (2,615.35)	\$ (1,329.45)					
Project 2 Total	\$ 414,394.50	\$ 731,088.00	\$ 644,433.37	\$ 666,910.99	\$ 691,556.01	\$ 717,067.82	\$ 742,093.48	\$ 767,992.54	\$ 794,795.48	\$ 822,533.84

Project 3 Components

Management/Administration (\$)		\$ 18,275.00	\$ 18,907.00	\$ 19,561.00	\$ 20,238.00	\$ 20,938.00	\$ 21,662.00	\$ 22,412.00	\$ 23,187.00	
Operation (\$)										
Maintenance (\$)		\$ 429,304.00	\$ 444,158.00	\$ 459,526.00	\$ 475,426.00	\$ 491,876.00	\$ 508,895.00	\$ 526,503.00	\$ 544,720.00	
Repair and Replacement (\$)		\$ 244,594.00	\$ 253,057.00	\$ 261,813.00	\$ 270,872.00	\$ 280,244.00	\$ 289,940.00	\$ 299,972.00	\$ 310,351.00	
Measurement and Verification (\$)		\$ 31,609.00	\$ 32,703.00	\$ 33,835.00	\$ 34,067.00	\$ 34,865.00	\$ 35,691.00	\$ 36,545.00	\$ 37,429.00	
Project 3 subtotal	\$ -	\$ -	\$ 723,782.00	\$ 748,825.00	\$ 774,735.00	\$ 789,603.00	\$ 816,923.00	\$ 845,188.00	\$ 874,432.00	\$ 904,687.00
Project 3 Markup (@33%)	\$ -	\$ -	\$ 238,848.00	\$ 247,112.00	\$ 255,663.00	\$ 260,569.00	\$ 269,585.00	\$ 278,912.00	\$ 288,563.00	\$ 298,547.00
Project 3 Total	\$ -	\$ -	\$ 962,630.00	\$ 995,937.00	\$ 1,030,398.00	\$ 1,050,172.00	\$ 1,086,508.00	\$ 1,124,100.00	\$ 1,162,995.00	\$ 1,203,234.00

Project 2 & 3 Components

Management/Administration (\$)	\$ -	\$ -	\$ 18,275.00	\$ 18,907.00	\$ 19,561.00	\$ 20,238.00	\$ 20,938.00	\$ 21,662.00	\$ 22,412.00	\$ 23,187.00
Operation (\$)	\$ 98,059.48	\$ 111,574.49	\$ 27,501.42	\$ 28,460.67	\$ 29,453.66	\$ 30,481.59	\$ 31,545.40	\$ 32,646.33	\$ 33,785.69	\$ 34,964.81
Maintenance (\$)	\$ -	\$ -	\$ 429,304.00	\$ 444,158.00	\$ 459,526.00	\$ 475,426.00	\$ 491,876.00	\$ 508,895.00	\$ 526,503.00	\$ 544,720.00
Repair and Replacement (\$)	\$ 209,500.00	\$ 426,307.28	\$ 685,770.72	\$ 709,621.80	\$ 734,306.85	\$ 759,856.39	\$ 786,293.94	\$ 813,651.08	\$ 841,960.60	\$ 871,255.00
Measurement and Verification (\$)	\$ 17,456.00	\$ 35,520.86	\$ 68,368.82	\$ 70,744.98	\$ 73,204.26	\$ 63,810.25	\$ 66,030.19	\$ 68,327.76	\$ 70,704.68	\$ 73,164.75
Project 2 & 3 subtotal	\$ 325,015.48	\$ 573,402.63	\$ 1,229,219.96	\$ 1,271,892.45	\$ 1,316,051.77	\$ 1,349,812.23	\$ 1,396,683.53	\$ 1,445,182.17	\$ 1,495,365.97	\$ 1,547,291.56
Project 2 & 3 Markup	\$ 89,379.02	\$ 157,685.37	\$ 377,843.41	\$ 390,955.54	\$ 405,902.24	\$ 417,427.59	\$ 431,917.95	\$ 446,910.37	\$ 462,424.51	\$ 478,476.28
Project 2 & 3 Total	\$ 414,394.50	\$ 731,088.00	\$ 1,607,063.37	\$ 1,662,847.99	\$ 1,721,954.01	\$ 1,767,239.82	\$ 1,828,601.48	\$ 1,892,092.54	\$ 1,957,790.48	\$ 2,025,767.84

Price Proposal

Performance Period Expense Detail

	Contract Year of Project II (mod), (Based on Cogeneration Project Award Date)									
	12	13	14	15	16	17	18	19	20	21
Start Date	1-Oct-12	1-Oct-13	1-Oct-14	1-Oct-15	1-Oct-16	1-Oct-17	1-Oct-18	1-Oct-19	1-Oct-20	1-Oct-21
End Date	30-Sep-13	30-Sep-14	30-Sep-15	30-Sep-16	30-Sep-17	30-Sep-18	30-Sep-19	30-Sep-20	30-Sep-21	30-Sep-22
	Performance Year Project II and III Combined									
	9	10	11	12	13	14	15	16	17	18
Start Date	1-Jan-13	1-Jan-14	1-Jan-15	1-Jan-16	1-Jan-17	1-Jan-18	1-Jan-19	1-Jan-20	1-Jan-21	1-Jan-22
End Date	31-Dec-13	31-Dec-14	31-Dec-15	31-Dec-16	31-Dec-17	31-Dec-18	31-Dec-19	31-Dec-20	31-Dec-21	31-Dec-22
	Project II Operational Year									
Year	11	12	13	14	15	16	17	18	19	20
Start Date	1-Jan-13	1-Jan-14	1-Jan-15	1-Jan-16	1-Jan-17	1-Jan-18	1-Jan-19	1-Jan-20	1-Jan-21	1-Jan-22
End Date	31-Dec-13	31-Dec-14	31-Dec-15	31-Dec-16	31-Dec-17	31-Dec-18	31-Dec-19	31-Dec-20	31-Dec-21	31-Dec-22

H-3 Performance Period Expenses

Project 2 Components

Management/Administration (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Operation (\$)	\$ 36,185.08	\$ 37,447.94	\$ 38,754.87	\$ 40,107.41	\$ 41,507.16	\$ 42,955.76	\$ 44,454.92	\$ 46,006.40	\$ 47,612.02	\$ 49,273.68
Maintenance (\$)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Repair and Replacement (\$)	\$ 580,479.54	\$ 600,738.28	\$ 621,704.05	\$ 643,401.53	\$ 665,856.24	\$ 689,094.62	\$ 713,144.02	\$ 738,032.76	\$ 763,790.11	\$ 790,446.38
Measurement and Verification (\$)	\$ 48,366.83	\$ 50,054.83	\$ 51,801.74	\$ 53,609.62	\$ 55,480.60	\$ 57,416.87	\$ 59,420.72	\$ 61,494.50	\$ 63,640.66	\$ 65,861.72
Project 2 subtotal	\$ 665,031.45	\$ 688,241.05	\$ 712,260.66	\$ 737,118.56	\$ 762,844.00	\$ 789,467.25	\$ 817,019.66	\$ 845,533.66	\$ 875,042.79	\$ 905,581.78
Project 2 Markup (@28%)	\$ 186,208.81	\$ 192,707.50	\$ 199,432.99	\$ 206,393.19	\$ 213,596.32	\$ 221,050.83	\$ 228,765.51	\$ 236,749.42	\$ 245,011.98	\$ 253,562.90
Project 2 Negotiated Price Adjustment										
Project 2 Total	\$ 851,240.26	\$ 880,948.55	\$ 911,693.65	\$ 943,511.75	\$ 976,440.32	\$ 1,010,518.08	\$ 1,045,785.17	\$ 1,082,283.08	\$ 1,120,054.77	\$ 1,159,144.68

Project 3 Components

Management/Administration (\$)	\$ 23,989.00	\$ 24,819.00	\$ 25,678.00	\$ 26,566.00	\$ 27,485.00	\$ 28,436.00	\$ 29,420.00	\$ 30,438.00	\$ 31,491.00	\$ 32,581.00
Operation (\$)										
Maintenance (\$)	\$ 563,567.00	\$ 583,066.00	\$ 603,240.00	\$ 624,112.00	\$ 645,706.00	\$ 668,047.00	\$ 691,161.00	\$ 715,075.00	\$ 739,817.00	\$ 765,415.00
Repair and Replacement (\$)	\$ 321,089.00	\$ 332,199.00	\$ 343,693.00	\$ 355,585.00	\$ 367,888.00	\$ 380,617.00	\$ 393,786.00	\$ 407,411.00	\$ 421,507.00	\$ 436,091.00
Measurement and Verification (\$)	\$ 42,930.00	\$ 28,289.00	\$ 29,268.00	\$ 30,281.00	\$ 49,187.00	\$ 32,412.00	\$ 33,533.00	\$ 34,693.00	\$ 56,356.00	\$ 37,136.00
Project 3 subtotal	\$ 951,575.00	\$ 968,373.00	\$ 1,001,879.00	\$ 1,036,544.00	\$ 1,090,266.00	\$ 1,109,512.00	\$ 1,147,900.00	\$ 1,187,617.00	\$ 1,249,171.00	\$ 1,271,223.00
Project 3 Markup (@33%)	\$ 314,020.00	\$ 319,563.00	\$ 330,620.00	\$ 342,060.00	\$ 359,788.00	\$ 366,139.00	\$ 378,807.00	\$ 391,914.00	\$ 412,226.00	\$ 419,504.00
Project 3 Total	\$ 1,265,595.00	\$ 1,287,936.00	\$ 1,332,499.00	\$ 1,378,604.00	\$ 1,450,054.00	\$ 1,475,651.00	\$ 1,526,707.00	\$ 1,579,531.00	\$ 1,661,397.00	\$ 1,690,727.00

Project 2 & 3 Components

Management/Administration (\$)	\$ 23,989.00	\$ 24,819.00	\$ 25,678.00	\$ 26,566.00	\$ 27,485.00	\$ 28,436.00	\$ 29,420.00	\$ 30,438.00	\$ 31,491.00	\$ 32,581.00
Operation (\$)	\$ 36,185.08	\$ 37,447.94	\$ 38,754.87	\$ 40,107.41	\$ 41,507.16	\$ 42,955.76	\$ 44,454.92	\$ 46,006.40	\$ 47,612.02	\$ 49,273.68
Maintenance (\$)	\$ 563,567.00	\$ 583,066.00	\$ 603,240.00	\$ 624,112.00	\$ 645,706.00	\$ 668,047.00	\$ 691,161.00	\$ 715,075.00	\$ 739,817.00	\$ 765,415.00
Repair and Replacement (\$)	\$ 901,568.54	\$ 932,937.28	\$ 965,397.05	\$ 998,986.53	\$ 1,033,744.24	\$ 1,069,711.62	\$ 1,106,930.02	\$ 1,145,443.76	\$ 1,185,297.11	\$ 1,226,537.38
Measurement and Verification (\$)	\$ 91,296.83	\$ 78,343.83	\$ 81,069.74	\$ 83,890.62	\$ 104,667.60	\$ 89,828.87	\$ 92,953.72	\$ 96,187.50	\$ 119,996.66	\$ 102,997.72
Project 2 & 3 subtotal	\$ 1,616,606.45	\$ 1,656,614.05	\$ 1,714,139.66	\$ 1,773,662.56	\$ 1,853,110.00	\$ 1,898,979.25	\$ 1,964,919.66	\$ 2,033,150.66	\$ 2,124,213.79	\$ 2,176,804.78
Project 2 & 3 Markup	\$ 500,228.81	\$ 512,270.50	\$ 530,052.99	\$ 548,453.19	\$ 573,384.32	\$ 587,189.83	\$ 607,572.51	\$ 628,663.42	\$ 657,237.98	\$ 673,066.90
Project 2 & 3 Total	\$ 2,116,835.26	\$ 2,168,884.55	\$ 2,244,192.65	\$ 2,322,115.75	\$ 2,426,494.32	\$ 2,486,169.08	\$ 2,572,492.17	\$ 2,661,814.08	\$ 2,781,451.77	\$ 2,849,871.68

Performance Period Costs (Project 3 Components)

ECSM # and Title	ECSM Acceptance Date (from Project Schedule)	Management / Administration (\$)	Operation (\$)	Maintenance (\$)	Repair and Replacement (\$)	Measurement and Verification (\$)
Fixed Service Costs		\$ 16,785				
1 Air Conditioning System Upgrade	11/15/04			\$ 147,763	\$ 65,996	\$ 12,197
2 Energy Management Control System	11/15/04			\$ 222,841	\$ 119,021	\$ 3,602
3 1 MW AC Photovoltaic System	7/9/04			\$ 14,000	\$ 35,093	\$ 11,597
4 Skylights and Daylighting Control	8/15/03			\$ 9,702	\$ 4,544	\$ 1,636
Totals	12/7/04	\$ 16,785	\$ -	\$ 394,306	\$ 224,654	\$ 29,032

- Note:** 1. Above Costs are in July 2002 dollars
2. Operation and Maintenance Costs are combined and shown as Mtce Costs Only
3. Above Costs Exclude Cogeneration related expenses.
4. ECSM Acceptance Dates include 30 day proof of performance period.
5. ECSM Acceptance Dates includes O&M Manuals & Training time provisions
6. Overall Project Acceptance Date is shown in Totals Row
7. Energy Management Control System Upgrade has Energy Management Specialist added to Maintenance Costs

Performance Period Costs (Project 3 Components) - Escalated to Start of Performance Term

ECSM # and Title	Administrative	Operation (\$)	Maintenance (\$)	Repair and Replacement (\$)	Measurement and Verification (\$)	Totals
Fixed Service Costs	\$ 18,275					\$ 18,275
1 Air Conditioning System Upgrade			\$ 160,878	\$ 71,854	\$ 13,280	\$ 246,012
2 Energy Management Control System Upgrade			\$ 242,620	\$ 129,585	\$ 3,922	\$ 376,127
3 1 MW AC Photovoltaic System			\$ 15,243	\$ 38,208	\$ 12,626	\$ 66,077
4 Skylights and Daylighting Control			\$ 10,563	\$ 4,947	\$ 1,781	\$ 17,291
Totals	\$ 18,275	\$ -	\$ 429,304	\$ 244,594	\$ 31,609	

- Note:** 1. Above Costs are in Jan 2005 dollars.
2. Costs are escalated at 3.46% per year.
3. Escalation formula applied is: Cost * (1+Escalation Rate)^{2.5}.

	Project Direct Costs					
Line No.	Item Description	Man-Hours	Labor Costs (incl. Burden)	Material Costs	Subcontract	Total Cost
1	Section 1- Project Level Costs from Project Development through T.O. Award					
1.1	Johnson Controls ESPC Development					
1.1.10	- Project Development Engineering	2,830	\$ 213,813	\$ -	\$ -	\$ 213,813
1.1.11	- Project Management		\$ -	\$ -	\$ -	\$ -
1.1.12	- Proposals & Management	1,550	\$ 116,551	\$ -	\$ -	\$ 116,551
1.1.13	- Clerical & Administrative		\$ -	\$ -	\$ -	\$ -
1.1.14	- Inspect and Validate		\$ -	\$ -	\$ -	\$ -
1.1.15	- Travel		\$ 7,532	\$ -	\$ -	\$ 7,532
	Subtotal				0.00	\$ 337,896
1.2	Subcontractor ESPC Development		\$ 62,500			\$ 62,500
1.2.1						\$ -
1.2.2						\$ -
1.2.3						\$ -
1.2.4						\$ -
1.2.5						\$ -
	Subtotal					\$ 62,500
	Section 1 Total					\$ 400,396
2	Section 2A - Project Level Costs from T.O. Award through Project Acceptance					
2.1	Miscellaneous Costs					
2.1.1	Permits & Fees					\$ -
2.1.2	Insurance					\$ -
2.1.3	Performance and Payment Bond					\$ 109,720
2.1.4	Sales Taxes (material only)					\$ -
2.1.5	Project Administration - Clerical	4,500				\$ 227,970
2.1.6	Office and Storage					\$ 12,200
2.1.7	Facilities, Utilities(Tele., Fax, etc. charges), Other					\$ 17,000
2.1.8	Office Supplies, Computer Supplies					\$ 20,000
2.1.9	Monthly Operating Expenses during Implementation					\$ 162,568
2.1.10	Warranty					\$ -
	Subtotal					\$ 549,458
2.2	Direct Design/Management Costs					
2.2.1	Project Post-award Design/Engineering, Study		\$ 241,250			\$ 241,250
2.2.2	Submittals, Design Review					\$ -
2.2.3	Project Engineer	4,500				\$ 306,855
2.2.4	Safety Plan Coordinator	4,500				\$ 306,855
2.2.5	Project Manager - Startup through Punch out	4,500			\$ 25,000	\$ 435,850
2.2.6	Travel-Project Manager					\$ 135,573
2.2.7	Contract Administration	1,339				\$ 125,662
2.2.8	Safety Plan & Compliance	285				\$ 31,005
2.2.9	Quality Control Plan & Assurance	217				\$ 23,505
2.2.10	Field Installation Operations Management	3,255				\$ 435,841
2.2.11	Travel - (FIOM)					\$ 42,750
2.2.12	Maintenance and Repair - Implementation Phase					\$ 105,500
2.2.13	Pre-Acceptance Measurement & Verification	250				\$ 18,450
2.2.14	Management Reserve					\$ 32,425
	Sub-total Direct Design/Management Costs					\$ 2,241,521
	Section 2A Total					\$ 2,790,979
	Total Project Direct Costs					\$ 3,191,375

Section 2B - Implementation Period ECSM Cost		
ECSM 1	Air-Conditioning System Upgrades	Total Cost
	Direct Construction Cost (Refer to Attached Subcontractor Cost Estimates for Construction Cost Detail)	
1.1.11	Johnson Controls Material and Labor	\$ -
1.1.12	Mechanical Sub-Contractor	\$ 22,896,226
1.1.13	Subcontractor Quote Changes	\$ (1,070,920)
1.1.14	this line unused	\$ -
1.1.15	Management Reserve	\$ 1,205,376
	Subtotal	\$ 23,030,682
1.1.81	Total System Commissioning	\$ -
1.1.82	Pre-Acceptance Measurement/Evaluation	\$ -
1.1.83	Manuf. Start-Up, Testing, Installn., Sequence	\$ -
1.1.84	Fire, Life Safety	\$ -
1.1.85	Inspection & Verification	\$ -
1.1.86	Graphics Software	\$ -
1.1.87	ATC Engg	\$ -
1.1.88	Travel	\$ -
1.1.89	Training (Johnson Controls Courses & On-site Training)	\$ -
	Subtotal	\$ -
1.1.91	Permits & Fees	\$ -
1.1.92	Insurance (material only)	\$ -
1.1.93	Performance and Payment Bond	\$ -
1.1.94	Office, Storage, Utilities, Supplies (600)	\$ -
1.1.95	Sales Tax (material only)	\$ -
1.1.96	Other: Clerical	\$ -
1.1.97	Freight	\$ -
1.1.99	Warranty	\$ -
	Subtotal	\$ -
	Total Direct Construction Cost	\$ 23,030,682
1.2	Direct Design/Management Costs	
1.2.11	Project Development	\$ -
1.2.12	Detailed Energy Survey/Preaward Design	\$ -
1.2.13	Post-award Project Design/Engineering	\$ -
1.2.14	Submittal Preparation, etc.-	\$ -
1.2.15	Project Startup/Mobilization	\$ -
1.2.21	Construction Supervision	\$ -
1.2.22	Project Documentation & O&M Manuals	\$ -
1.2.23	Quality Assurance	\$ -
1.2.24	Safety Compliance	\$ -
1.2.25	Project Management	\$ -
1.2.26	As-Built Drawings -	\$ -
	Total Direct Design/Management Costs	\$ -
	ECSM Total Estimated Cost	\$ 23,030,682

MAGTFTC Twentynine Palms Project 3 5/27/02
HVAC Improvements 7/11/02
Subcontractor Price Summary
West Coast Air Cond.

TASK	Price	Detail Included	Comment
1400 Plant	\$ 3,155,452	Yes, 3 pages	Price correct to account for overcount on VFD
1600 Plant	\$ 3,155,452	Yes, same as above	Price correct to account for overcount on VFD
1800 Plant	\$ 2,208,718	Yes	Price correct to account for overcount on VFD
1400 UG Piping	\$ 1,906,939	No	Replaced with Steel Pipe Support Detail
1600 UG Piping	\$ 2,136,404	No	Replaced with Steel Pipe Support Detail
1800 UG Piping	\$ 964,524	Yes	Price adjusted to reflect Schedule 20 Steel Pipe
Add Utility Trench 1400	\$ 1,441,617	No	Replaced with Steel Pipe Support Detail
Add Utility Trench 1600	\$ 1,455,743	No	Replaced with Steel Pipe Support Detail
1400 Block Utility Trench and Steel Pipe	\$ 3,825,568	Yes	New Cost detail to reflect Schedule 20 Steel Pipe and Utility Trench
1600 Block Utility Trench and Steel Pipe	\$ 4,237,108	Yes	New Cost detail to reflect Schedule 20 Steel Pipe and Utility Trench
UG Piping to Building 1440 (P-557)	\$ 136,322	Yes	Added to scope per comments.
Building 1360	\$ 28,954	Yes	
Building 1412	\$ 28,954	Yes	
Building 1423	\$ 28,954	Yes	
Building 1403	\$ 325,336	Yes	
Building 1443	\$ 325,336	Yes	
Building 1607	\$ 325,336	Yes	
Building 1616	\$ 325,336	Yes	
Building 1627	\$ 325,336	Yes	
Building 1636	\$ 325,336	Yes	
Building 1645	\$ 325,336	Yes	
Building 1591 Dental	\$ 117,370	Yes	
Building 1551	\$ 28,954	Yes	
Total Priority "A" Scope	\$ 20,193,680		
Building 1541	\$ 241,710	Yes	
Building 1542	\$ 199,699	Yes	
Building 1549	\$ 28,954	Yes	
Building 1552	\$ 206,106	Yes	Pricing error correction. Originally based on chilled water connection only and did not include DX unit conversions.
Building 1587	\$ 162,377	Yes	Building added to scope per comments.
Building 1738	\$ 248,777	Yes	Building scope errantly left out of original proposal pricing.
Building 1826	\$ 137,174	Yes	
Building 1828	\$ 137,174	Yes	
Building 1833	\$ 137,174	Yes	
Building 1839	\$ 137,174	Yes	
Building 1825	\$ 179,390	Yes	
Building 1830	\$ 42,054	Yes	
Building 1831	\$ 114,121	Yes	
Building 1843	\$ 230,331	Yes	
Building 1847	\$ 139,318	Yes	
Building 1848	\$ 86,591	Yes	
Building 1859	\$ 57,392	Yes	
Building 1865	\$ 172,490	Yes	
Building 1584	\$ 44,540	Yes	Building reinserted per customer direction.
Total Priority "B" Buildings	\$ 2,702,546		
Total Priority "A" & "B"	\$ 22,896,226		

MAGTFTC Twentynine Palms Project 3 **5/25/02**
Central Plant Costs
1400 /1600 Blocks
1200 ton w/ 1200 future

Building Construction			\$ 719,229
Domestic Plumbing			incl
Mechanical Piping			\$ 325,418
Distribution Piping			\$ -
HVAC Ductwork			incl
Electrical	Cardinal		\$ 308,302
Equipment			\$ 990,397
Plant Controls			Exclude
Start-up & Warranty			\$ 15,000
QC & Inspection Costs			Exclude
Chiller 5 Yr. Warranty			\$ -
General Condition Costs	6 months	25000	\$ 150,000
Utility Costs for Start-Up			Exclude
Final Clean			\$ 2,500
Permits			Exclude
Sub-Total			\$ 2,510,846
Fee	15%		\$ 376,627
Bond	1.00%		\$ 28,875
Liability Insurance	0.65%		\$ 18,956
Design	7.50%		\$ 220,148
Total Construction Cost			\$ 3,155,452

-Revised per comments (see support sheet)

MAGTFTC Twentynine Palms Project 3

5/25/02

1400 /1600 Central Plant Equipment

Description	Qty	Material	Shop	Field	Subs
Chillers	1	\$ 192,962	0	96	\$ 3,000
Absorber	1	\$ 385,035	0	64	\$ 3,000
Cooling Towers	3	\$ 105,870	0	120	\$ 2,500
Condensor Pumps	3	\$ 40,500	0	48	\$ -
Primary CHW Pumps	3	\$ 22,500	0	48	\$ -
HTHW Pumps	2	\$ 32,000	0	32	\$ -
Secondary CHW Pump	3	\$ 28,500	0	48	\$ -
VFDs	6	\$ 24,000	0	42	\$ -
Air Sep.,Exp. Tanks	2	\$ 4,500	0	32	\$ -
Chemicals		\$ -	0	0	\$ 25,000
Tower Filter	3	\$ 19,800	0	24	\$ -
Refrigerant Monitor	1	\$ 4,500	0	8	\$ -
Totals		\$ 860,167	0	562	\$ 33,500
Material					\$ 860,167
Tax		7.75%			\$ 66,663
Labor	562	46			\$ 25,852
Supervision	56.2	52			\$ 2,922
Tools & Trucks					\$ 1,293
Rigging & Subs					\$ 33,500
Total					\$ 990,397

Revised per comments

MAGTFTC Twentynine Palms Project 3

5/24/02

1400/ 1600 Central Plant Piping

Description	Qty	Material	Shop	Field	Subs
CHW, CDW	960	\$ 48,000		1680	
HTHW	300	\$ 9,000		345	
Site HTHW Piping	200	\$ 10,000		240	
Supports	12	\$ 1,500	36	54	\$ 900
Insulation		\$ -		0	\$ 45,000
Towers	3	\$ 3,000		72	
Chillers	2	\$ 6,000		48	
Absorber	1	\$ 4,000		40	
Pumps	11	\$ 11,000		176	
Filter Piping	3	\$ 1,800		72	
Material					\$ 94,300
Tax		7.75%			\$ 7,308
Shop		36	56		\$ 2,016
Field		2727	46		\$ 125,442
Supervision		273	52		\$ 14,180
Tools&Trucks					\$ 6,272
Rigging & Hoisting					\$ 15,000
Project Management					\$ -
General Conditions					\$ -
Permits					\$ -
Design					\$ -
Start-up & Warranty					\$ 15,000
Sub-contracts					\$ 45,900
Sub-Total					\$ 325,419
Fee					\$ -
Bond					\$ -
Contengency					
Total cost					\$ 325,419

MAGTFTC Twentynine Palms Project 3

5/25/02

Central Plant Costs

1800 Block

600 Ton w/ 300 Future

Building Construction			\$ 677,912
Domestic Plumbing			incl
Mechanical Piping			\$ 202,386
Distribution Piping			\$ -
HVAC Ductwork			incl
Electrical	Cardinal		\$ 189,445
Equipment			\$ 520,271
Plant Controls			Exclude
Start-up & Warranty			\$ 15,000
QC & Inspection Costs			Exclude
Chiller 5 Yr. Warranty			\$ -
General Condition Costs	6 months	25000	\$ 150,000
Utility Costs for Start-Up			Exclude
Final Clean			\$ 2,500
Permits			Exclude
Sub-Total			\$ 1,757,514
Fee	15%		\$ 263,627
Bond	1.00%		\$ 20,211
Liability Insurance	0.65%		\$ 13,269
Design	7.50%		\$ 154,097
Total Construction Cost			\$ 2,208,718

-Revised per comments (see support sheet)

MAGTFTC Twentynine Palms Project 3

5/25/02

1800 Block Central Plant Equipment

Description	Qty	Material	Shop	Field	Subs
Chillers	2	\$ 246,820	0	120	\$ 4,500 (2) 300 Ton
Absorber	0	\$ -	0	0	\$ -
Cooling Towers	3	\$ 64,000	0	120	\$ 2,500
Condensor Pumps	3	\$ 22,500	0	48	\$ -
Primary CHW Pumps	3	\$ 21,000	0	48	\$ -
HTHW Pumps	0		0		\$ -
Secondary CHW Pump	3	\$ 27,000	0	48	\$ -
VFDs	5	\$ 20,000	0	36	\$ -
Air Sep.,Exp. Tanks	2	\$ 3,500	0	32	\$ -
Chemicals		\$ -	0	0	\$ 25,000
Tower Filter	3	\$ 19,800	0	24	\$ -
Refrigerant Monitor	1	\$ 4,500	0	8	\$ -
Totals		\$ 429,120	0	484	\$ 32,000
Material					\$ 429,120
Tax		7.75%			\$ 33,257
Labor	484	46			\$ 22,264
Supervision	48.4	52			\$ 2,517
Tools & Trucks					\$ 1,113
Rigging & Subs					\$ 32,000
Total					\$ 520,271

Revised per comments

MAGTFTC Twentynine Palms Project 3
Central Plant 1800 Block
PRELIMINARY ESTIMATE

DATE: 5/25/02

	DESCRIPTION	QUANT.	UNIT	UNIT \$	\$	TOTAL \$
1	Job Conditions - in summary	0	mos	0	0	0
2	Architect fees & copy costs - N.I.C.	0	ls	0	0	0
3	Engineer fees N.I.C.	0	ls	0	0	0
4	QA/QC Program, Inspector - N.I.C.	0	mos	0	0	0
5	Grading	1	ls	15,000	15,000	15,000
6	Over excavation & recompact	2,115	cy	8	16,920	16,920
7	Site Drains & Utilities	1	ls	30,000	30,000	30,000
8	Chainlink yard fence - 8'	0	lf	15	0	0
9	Asphalt / Concrete Aprons	7,500	sf	4	30,000	30,000
10	Sidewalks	976	sf	5	4,392	4,392
11	Landscaping and irrigation	1	ls	5,000	5,000	5,000
12	Foundations	62	cy	350	21,700	21,700
13	Building SOG	102	cy	300	30,600	30,600
14	Cooling Tower Piers	18	cy	600.00	10,800	10,800
15	Housekeeping Pads	964	sf	7.50	7,230	7,230
16	Grout Equipment	1	ls	4,000	4,000	4,000
17	Reinforcing Steel	25,000	lbs	1.65	41,250	41,250
18	Anchor Bolts	1	ls	3,000	3,000	3,000
19	CMU 12"	2,976	sf	22	65,472	65,472
20	CMU 8"	5,904	lbs	18.00	106,272	106,272
21	CMU rebar	8,880	sf	1	5,772	5,772
22	Structural steel - material, fab & erection	40,000	lbs	1.40	56,000	56,000
23	Roof ladder and landings	1	lf	2,500.0	2,500	2,500
24	Roof hatch	1	sf	750	750	750
25	Metal roof deck	3,600	sf	3.50	12,600	12,600
26	Misc Steel	1	ls	7,500.00	7,500	7,500
27	Sheet Metal Wall Cap	412	lf	6.0	2,472	2,472
28	Roofing	3,600	ls	5	18,900	18,900
29	Skylights	4	ea	700	2,800	2,800
30	Wall louvers	7	ea	600.0	4,200	4,200
31	Doors & Frames	7	ea	1,800	12,600	12,600
32	Window Frames	11	ea	500	5,500	5,500
33	Windows 4' x 4'	11	ea	750	8,250	8,250
34	Interior Walls	104	lf	125	13,000	13,000
35	Flooring	276	sf	4.5	1,242	1,242
36	Acoustic Ceiling	276	sf	4	1,104	1,104
37	Ceramic Tile	338	sf	12.50	4,225	4,225
38	Shower	1	ea	2,000	2,000	2,000
39	Painting	1	ls	15,000	15,000	15,000
40	Fire extinguishers	4	ea	125	500	500
41	Fire Sprinklers	3,600	sf	4.50	16,200	16,200
42	Plumbing & Roof Drainage	1	ls	71,869	71,869	71,869
43	HVAC & Ventilation	1	ea	21,292	21,292	21,292
44						
45						
46						
47						
48						
49						
50						
51						
52	Subtotal				677,912	677,912
53	Contingency				0	0
54	TOTAL				677,912	677,912

MAGTFTC Twentynine Palms Project 3

9/18/02

Infrastructure Piping

1400 Block

Steel Trench Piping

Description	Qty	Material	Shop	Field	Subs
Trench Piping	11,660	\$ 583,000		8,745	\$ 12,000
UG CHW Piping	0	\$ -			
AG CHW Piping	0	\$ -			
AG CHW Piping	0			\$	-
Supports	0	\$ -		\$	-
Support Footings	0	\$ -		\$	-
POC Piping	20	\$ 50,000		640	
Boiler Plant Pipe		\$ -			
Hospital Piping		\$ -			
Steam Generator	0	\$ -			
Insulation				\$	-
Asphalt,Concrete				\$	-
Trenching	2,980			\$	342,700
Utility Trench	2,850			\$	1,425,000
Demo Exist Equip	0	\$ -			
Material				\$	633,000
Tax		7.75%		\$	49,058
Shop		0	\$ 56	\$	-
Field		9,385	\$ 46	\$	431,710
Supervision		938.5	\$ 52	\$	48,802
Project Management		0	\$ 60	\$	-
General Conditions		4	\$ 25,000	\$	100,000
Tools&Trucks				\$	21,586
Sub-contracts				\$	1,779,700
Sub-Total				\$	3,063,855
Fee			15%	\$	459,578
Bond			1%	\$	35,234
Design			7.5%	\$	266,900
Total cost				\$	3,825,568

MAGTFTC Twentynine Palms Project 3

9/18/02

Infrastructure Piping

1600 Block

Steel Trench Piping

Description	Qty	Material	Shop	Field	Subs
UG CHW PIPINC	13632	\$ 681,600		10,224	\$ 12,000
UG CHW Piping	0	\$ -			
AG CHW Piping	0	\$ -			
AG CHW Piping	0			\$	-
Supports	0	\$ -		\$	-
Support Footings	0	\$ -		\$	-
POC Piping	27	\$ 67,500		864	
Boiler Plant Pipe		\$ -			
Hospital Piping		\$ -			
Steam Generator	0	\$ -			
Insulation				\$	-
Asphalt,Concrete				\$	-
Trenching	3966			\$	456,090
Utility Trench	2850			\$	1,425,000
Demo Exist Equip	0	\$ -			
Material				\$	749,100
Tax		7.75%		\$	58,055
Shop	0	\$ 56		\$	-
Field	11,088	\$ 46		\$	510,048
Supervision	1,108.8	\$ 52		\$	57,658
Project Management	0	\$ 60		\$	-
General Conditions	4	\$25,000		\$	100,000
Tools&Trucks					25,502.40
Sub-contracts				\$	1,893,090
Sub-Total				\$	3,393,453
Fee			15%	\$	509,018
Bond			1%	\$	39,025
Design			7.5%	\$	295,612
Total cost				\$	4,237,108

MAGTFTC Twentynine Palms Project 3

5/25/02

Infrastructure Piping

1800 Block

Description	Qty	Material	Shop	Field	Subs
UG CHW PIPING	6680	\$ 200,400		2,004	\$ 4,000
UG CHW Piping	0	\$ -		0	
AG CHW Piping	0	\$ -		0	
AG CHW Piping	0	\$ -		0	\$ -
Supports	0	\$ -	0	0	\$ -
Support Footings	0	\$ -		0	\$ -
POC Piping	16	\$ 16,000		512	
Boiler Plant Pipe		\$ -		0	
Hospital Piping		\$ -		0	
Steam Generator	0	\$ -		0	
Insulation					\$ -
Asphalt,Concrete					\$ -
Trenching	3340				\$ 350,700
Demo Exist Equip	0	\$ -		0	
Material					\$ 216,400
Tax		7.75%			\$ 16,771
Shop		0	\$ 56		\$ -
Field		2,516	\$ 46		\$ 115,736
Supervision		251.6	\$ 52		\$ 13,083
Project Management		0	\$ 60		\$ -
General Conditions		2	\$ 25,000		\$ 50,000
Tools&Trucks					\$ 5,787
Sub-contracts					\$ 354,700
Sub-Total					\$ 772,477
Fee			15%		\$ 115,872
Bond			1%		\$ 8,883
Design			8%		\$ 67,292
Total cost					\$ 964,524
Cost Per ft					\$ 144

MAGTFTC Twentynine Palms Project 3

8/29/02

UG Piping

Building P-557

Description	Qty	Material	Shop	Field	Subs
UG CHW PIPING	992	\$ 23,808		218.24	\$ 2,000
UG CHW Piping	0	\$ -			
AG CHW Piping	0	\$ -			
AG CHW Piping	0	\$ -		\$	-
Supports	0	\$ -		\$	-
Support Footings	0	\$ -		\$	-
POC Piping	1	\$ 1,000		32	
Boiler Plant Pipe		\$ -			
Hospital Piping		\$ -			
Steam Generator	0	\$ -			
Insulation				\$	-
Asphalt,Concrete				\$	-
Trenching	496			\$	54,560
Demo Exist Equip	0	\$ -			
Material				\$	24,808
Tax		7.75%		\$	1,923
Shop		0 \$	56	\$	-
Field		250.24 \$	46	\$	11,511
Supervision		25.024 \$	52	\$	1,301
Project Management		0 \$	60	\$	-
General Conditions		0.5 \$	25,000	\$	12,500
Tools&Trucks					575.55
Sub-contracts				\$	56,560
Sub-Total				\$	109,178
Fee			15%	\$	16,377
Bond			1%	\$	1,256
Design			7.5%		9,510.81
Total cost				\$	136,322
Cost Per ft				\$	137.42

MAGTFTC Twentynine Palms Project 3 **5/25/02**
Barracks Conversions to Chilled Water
Typical Buildings 1403,1443,1607,1616,1627,1636,164

Description	Qty	Material	Shop	Field	Subs
Demolition	10	\$ 1,000	40	160	\$ 2,500
Curb Modification	10	\$ 1,500		320	\$ -
Adaptor Curbs	10	\$ 7,500	320	80	\$ 2,500
Air Handlers	10	\$ 50,000		160	\$ 2,500
Duct Transitions	10	\$ 3,000	160	160	\$ -
Condensate Piping	10	\$ 500		40	\$ -
Gas Piping	0	\$ -			\$ -
CHW Piping	1080	\$ 24,840		399.6	\$ -
Coil Connections	10	\$ 3,500		160	\$ -
Electrical	10	\$ -			\$ 12,000
Insulation	2	\$ -			\$ 4,000
Roofing	10	\$ -			\$ 7,500
Cut & Patch	8	\$ -			\$ -
Balance		\$ -			\$ 6,000
Start-up & Warranty					\$ 5,000
Material					\$ 91,840
Tax					\$ 7,118
Shop		520	48		\$ 24,960
Field		1479.6	42		\$ 62,143
Supervision		147.96	46		\$ 6,806
Project Management		147.96	60		\$ 8,878
Tools and trucks					\$ 3,107
General Conditions		0.5	\$ 25,000		\$ 12,500
Sub Contracts					\$ 42,000
Sub-Total					\$ 259,352
Profit and Overhead			15%		\$ 38,903
Bond			1%		\$ 2,983
Design			8.0%		\$ 24,099
Total Cost					\$ 325,336

MAGTFTC Twentynine Palms Project 3
Connect Only Buildings

5/25/02

Description	Qty	Material	Shop	Field	Subs
Pipe & Valves	ls	\$ 3,500		160	\$ 250
Coring		\$ -			\$ 300
Insulation		\$ -			\$ 1,250
Start-up & Commission		\$ 500		32	\$ 500
Balance		\$ -			\$ 1,200
Material					\$ 4,000
Tax		7.75%			\$ 310
Shop		0	56		\$ -
Field		192	46		\$ 8,832
Supervision		19.2	52		\$ 998
Tools&Trucks					\$ 442
Project Management			60		\$ -
General Conditions			0.2	\$25,000	\$ 5,000
Permits					\$ -
Sub-Contracts					\$ 3,500
Sub-Total					\$ 23,082
Fee			15%		\$ 3,462
Bond			1%		\$ 265
Design			8%		\$ 2,145
Total cost					\$ 28,955
Typical Buildings:1360,1412,1423,1549,1551,1552					

MAGTFTC Twentynine Palms Project 3 **5/25/02**
Building 1587 Chilled Water Connect

Description	Qty	Material	Shop	Field	Subs
Pipe & Valves	ls	\$ 3,500		160	\$ 250
Coring		\$ -			\$ 300
Insulation		\$ -			\$ 1,250
Start-up & Commission		\$ 500		32	\$ 500
Balance		\$ -			\$ 1,200
Site Piping	840	\$ 29,400		235.2	\$ 54,600
Material					\$ 33,400
Tax		7.75%			\$ 2,589
Shop		0	56		\$ -
Field		427.2	46		\$ 19,651
Supervision		42.72	52		\$ 2,221
Tools&Trucks					\$ 983
Project Management			60		\$ -
General Conditions			0.50	\$25,000	\$ 12,500
Permits					\$ -
Sub-Contracts					\$ 58,100
Sub-Total					\$ 129,444
Fee			15%		\$ 19,417
Bond			1%		\$ 1,489
Design			8%		\$ 12,028
Total cost					\$ 162,377
Typical Buildings:1360,1412,1423,1549,1551,1552					

MAGTFTC Twentynine Palms Project 3

5/25/02

Building 1591 Dental Clinic

Description	Qty	Material	Shop	Field	Subs
Chilled Water	660	\$ 19,800		264	
Coil Connections	2	\$ 1,500		64	
Coils	2	\$ 17,500	48	48	\$ 1,500
Demolition	4	\$ 250		96	\$ 2,500
Insulation		\$ -		0	\$ 2,500
Balance Building					\$ 12,500
Material					\$ 39,050
Tax		7.75%			\$ 3,026
Shop		48	56		\$ 2,688
Field		472	42		\$ 19,824
Supervision		47.2	46		\$ 2,171
Tools&Trucks					\$ 991
General Conditions		0.25	\$ 25,000		\$ 6,250
Start-Up & Flushing					\$ 1,500
Sub-contracts					\$ 19,000
Sub-Total					\$ 94,501
Fee			15%		\$ 14,175
Design			8%		\$ 8,694
Contengency			0%		\$ -
Total cost					\$ 117,370

MAGTFTC Twentynine Palms Project 3
Building 1541 Chapel

5/25/02

Description	Qty	Material	Shop	Field	Subs
Demolition	5	\$ 500		80	\$ 750
Air Handlers	3	\$ 40,000	12	48	\$ 750
Duct Transitions	6	\$ 1,800	96	96	\$ -
New Duct & Grill	0	\$ -			\$ -
Condensate Piping	3	\$ 300		24	\$ -
Gas Piping	0	\$ -			
CHW Piping	4	\$ 10,000		192	
UG Chilled Water	768	\$ 24,960		215.04	\$ 44,851
Electrical	3	\$ -			\$ 4,500
Controls	2	\$ -			\$ -
Roofing	3	\$ -			\$ 3,000
Cut & Patch	3	\$ -			\$ 4,500
Balance		\$ -			\$ 2,000
Start-up & Warranty		\$ -			\$ 1,500
Material					\$ 77,560
Tax					\$ 6,011
Shop		108	48		\$ 5,184
Field		655.04	42		\$ 27,512
Supervision		65.5	46		\$ 3,013
Project Management		65.5	60		\$ 3,930
Tools and trucks					\$ 1,376
General Conditions		0.25	\$ 25,000		\$ 6,250
Sub Contracts					\$ 61,851
Sub-Total					\$ 192,687
Profit and Overhead			15%		\$ 28,903
Bond			1%		\$ 2,216
Design			8%		\$ 17,904
Total Cost					\$ 241,710

MAGTFTC Twentynine Palms Project 3
Building 1542 Chapel

5/25/02

Description	Qty	Material	Shop	Field	Subs
Demolition	5	\$ 500		80	\$ 750
Air Handlers	3	\$ 40,000	12	48	\$ 750
Duct Transitions	6	\$ 1,800	96	96	\$ -
New Duct & Grill	0	\$ -			\$ -
Condensate Piping	3	\$ 300		24	\$ -
Gas Piping	0	\$ -			
CHW Piping	4	\$ 10,000		192	
UG Chilled Water	460	\$ 14,950		128.8	\$ 26,864
Electrical	3	\$ -			\$ 4,500
Controls	2	\$ -			\$ -
Roofing	3	\$ -			\$ 3,000
Cut & Patch	3	\$ -			\$ 4,500
Balance		\$ -			\$ 2,000
Start-up & Warranty		\$ -			\$ 1,500
Material					\$ 67,550
Tax					\$ 5,235
Shop		108	48		\$ 5,184
Field		569	42		\$ 23,890
Supervision		57	46		\$ 2,616
Project Management		57	60		\$ 3,413
Tools and trucks					\$ 1,194
General Conditions		0.25	\$ 25,000		\$ 6,250
Sub Contracts					\$ 43,864
Sub-Total					\$ 159,196
Profit and Overhead			15%		\$ 23,879
Bond			1%		\$ 1,831
Design			8%		\$ 14,793
Total Cost					\$ 199,699

MAGTFTC Twentynine Palms Project 3
Building 1552

8/19/02

Description	Qty	Material	Shop	Field	Subs
Demolition	6	\$ 600	24	96	\$ 2,500
Curb Modification	6	\$ 900		192	\$ -
Adapter Curbs	6	\$ 4,500	192	48	\$ 2,500
Air Handlers	6	\$ 32,000		96	\$ 2,500
Duct Transitions	6	\$ 1,800	96	96	\$ -
Condensate Piping	6	\$ 300		24	\$ -
Gas Piping	0	\$ -			\$ -
CHW Piping	560	\$ 12,880		207.2	\$ -
Coil Connections	6	\$ 2,100		96	\$ -
Electrical	6	\$ -			\$ 7,200
Insulation	2	\$ -			\$ 4,000
Roofing	6	\$ -			\$ 4,500
Cut & Patch	6	\$ -			\$ -
Balance		\$ -			\$ 4,500
Start-up & Warranty		\$ -			\$ 3,000
Material					\$ 55,080
Tax					\$ 4,269
Shop		312.00	48		\$ 14,976
Field		855.20	42		\$ 35,918
Supervision		85.52	46		\$ 3,934
Project Management		85.52	60		\$ 5,131
Tools and trucks					\$ 1,796
General Conditions		0.5	\$ 25,000		\$ 12,500
Sub Contracts					\$ 30,700
Sub-Total					\$ 164,304
Profit and Overhead			15%		\$ 24,646
Bond			1%		\$ 1,889
Design			8%		\$ 15,267
Total Cost					\$ 206,106

MAGTFTC Twentynine Palms Project 3
Building 1738

8/10/02

Description	Qty	Material	Shop	Field	Subs
Demolition	1	\$ 250	24	160	\$ 1,500
A/H-6 Rebuild	1	\$ 10,000		96	\$ 1,500
A/C units	3	\$ 29,250		48	\$ 1,800
Ductwork	8000	\$ 3,680	280	400	\$ -
Liner	5000	\$ 2,500	50		\$ -
VAV Dampers	11	\$ 1,650		22	\$ -
Grilles	40	\$ 1,400		20	\$ -
Van Connections	7	\$ 1,050		28	\$ -
HTHW Piping		\$ 3,000	16	120	\$ -
Coil Connections	2	\$ 500		8	\$ -
Pipe Supports		\$ 500	32	32	\$ 800
Equip Platforms	3	\$ 1,500	48	144	\$ 3,600
Relocate Floor Di	14	\$ -		14	\$ -
Insulation		\$ -			\$ 3,600
Electrical		\$ -			\$ 12,500
Balance		\$ -			\$ 4,500
Ceiling Re-work		\$ -			\$ 2,500
Misc. Cut & Patch		\$ -			\$ 2,500
Material					\$ 55,280
Tax			7.75%		\$ 4,284
Shop		450	56		\$ 25,200
Field		1092	46		\$ 50,232
Supervision		240	52		\$ 12,480
Project Management		64	60		\$ 3,840
Tools and trucks					\$ 2,512
Labor Burden			25%		\$ 12,558
General Conditions		0.5	\$ 25,000		\$ 12,500
Permits					\$ -
Start-up & Warranty					\$ 500
Sub Contracts					\$ 34,800
Sub-Total					\$ 214,186
Profit and Overhead			15%		\$ 32,128
Bond			1%		\$ 2,463
Design			0%		\$ -
Total Cost					\$ 248,777

MAGTFTC Twentynine Palms Project 3
Building 1826,1828,1833,1839

5/25/02

Description	Qty	Material	Shop	Field	Subs
Demolition	3	\$ 300	24	72	\$ 1,500
Structural Upgrad	1	\$ 250	16	64	\$ -
A/C units	1	\$ 17,500	4	16	\$ 1,500
Duct Furnaces	3	\$ 5,400		72	\$ -
Zone Dampers	0	\$ -			\$ -
Duct Transitions	6	\$ 1,800	96	96	\$ -
New Duct & Grill	0	\$ -			\$ -
Condensate Piping	1	\$ 100		8	\$ -
Gas Piping	3	\$ 750		18	\$ -
CHW Piping	1	\$ 4,000		64	\$ -
Site Chilled Water	256	\$ 5,888		71.68	\$ 14,848
Electrical	1	\$ -			\$ 3,500
Controls	2	\$ -			\$ -
Roofing	2	\$ -			\$ 2,500
Cut & Patch	2	\$ -			\$ 2,000
Balance		\$ -			\$ 4,000
Start-up & Warranty		\$ -			\$ 1,500
Material					\$ 35,988
Tax					\$ 2,699
Shop		140	48		\$ 6,720
Field		482	42		\$ 20,231
Supervision		48	46		\$ 2,216
Project Management		48	60		\$ 2,890
Tools and trucks					\$ 1,012
General Conditions					\$ 6,250
Sub Contracts					\$ 31,348
Sub-Total					\$ 109,353
Profit and Overhead			15%		\$ 16,403
Bond			1%		\$ 1,258
Design			8%		\$ 10,161
Total Cost					\$ 137,175

MAGTFTC Twe 29Palms Phase 3
Building 1825

5/25/02

Description	Qty	Material	Shop	Field	Subs
Demolition	3	\$ 300	12	48	\$ 2,500
Curb Modification	3	\$ 450		96	\$ -
Adaptor Curbs	3	\$ 2,250	96	24	\$ 2,500
Air Handlers	3	\$ 24,000		48	\$ 2,500
Duct Transitions	6	\$ 1,800	96	96	\$ -
Condensate Piping	3	\$ 150		12	\$ -
Gas Piping	3	\$ 750		18	\$ -
CHW Piping	500	\$ 11,500		185	\$ -
Site Chilled Water	250	\$ 5,750		67.5	\$ 14,500
Coil Connections	3	\$ 1,050		48	\$ -
Electrical	3	\$ -			\$ 3,600
Insulation	3	\$ -			\$ 4,000
Roofing	3	\$ -			\$ 4,500
Cut & Patch	8	\$ -			\$ -
Balance		\$ -			\$ 4,500
Start - & Warranty		\$ -			\$ 1,500
Material					\$ 48,000
Tax					\$ 3,720
Shop		204	48		\$ 9,792
Field		642.5	42		\$ 26,985
Supervision		64.25	46		\$ 2,956
Project Management		64.25	60		\$ 3,855
Tools and trucks					\$ 1,349
General Conditions					\$ 6,250
Sub Contracts					\$ 40,100
Sub-Total					\$ 143,007
Profit and Overhead			15%		\$ 21,451
Bond			1%		\$ 1,645
Design			8%		\$ 13,288
Total Cost					\$ 179,391

MAGTFTC Twentynine Palms Project 3
Building 1830

7/18/02

Description	Qty	Material	Shop	Field	Subs
Chilled Water	125	\$ 3,750		50	
Coil Connections	1	\$ 750		32	
Coils	1	\$ 5,500	16	24	\$ 1,500
Demolition	1	\$ 100		24	\$ 2,500
Insulation		\$ -			\$ 1,000
Balance Building					\$ 3,000
Material					\$ 10,100
Tax		7.75%			\$ 783
Shop		16	56		\$ 896
Field		130	42		\$ 5,460
Supervision		13	46		\$ 598
Tools&Trucks					\$ 273
General Conditions					\$ 6,250
Start-Up & Flushing					\$ 1,500
Sub-contracts					\$ 8,000
Sub-Total					\$ 33,860
Fee			15%		\$ 5,079
Design			8%		\$ 3,115
Contingency			0%		\$ -
Total cost					\$ 42,054

MAGTFTC Twentynine Palms Project 3
Building 1831

5/25/02

Description	Qty	Material	Shop	Field	Subs
Chilled Water	640	\$ 19,200		256	
Coil Connections	3	\$ 2,250		96	
Coils	3	\$ 17,500	48	72	\$ 1,500
Demolition	3	\$ 300		72	\$ 2,500
Insulation		\$ -			\$ 3,000
Balance Building					\$ 8,000
Material					\$ 39,250
Tax		7.75%			\$ 3,042
Shop		48	56		\$ 2,688
Field		496	42		\$ 20,832
Supervision		49.6	46		\$ 2,282
Tools&Trucks					\$ 1,042
General Conditions					\$ 6,250
Start-Up & Flushing					\$ 1,500
Sub-contracts					\$ 15,000
Sub-Total					\$ 91,885
Fee			15%		\$ 13,783
Design			8%		\$ 8,453
Contingency			0%		\$ -
Total cost					\$ 114,121

MAGTFTC Twentynine Palms Project 3
Building 1843

5/25/02

Description	Qty	Material	Shop	Field	Subs
Demolition	3	\$ 300	24	72	\$ 1,500
Structural Upgrades	2	\$ 500	16	64	\$ -
A/C units	2	\$ 20,000	8	32	\$ 1,500
Duct Furnaces	2	\$ 3,600		48	\$ -
Zone Dampers	0	\$ -			\$ -
Duct Transitions	6	\$ 1,800	96	96	\$ -
New Duct & Grilles	0	\$ -			\$ -
Condensate Piping	2	\$ 200		16	\$ -
Gas Piping	3	\$ 750		18	\$ -
CHW Piping	1	\$ 4,000		64	\$ -
Site Chilled Water	1000	\$ 23,000		280	\$ 58,000
Electrical	1	\$ -			\$ 3,500
Controls	2	\$ -			\$ -
Roofing	2	\$ -			\$ 2,500
Cut & Patch	2	\$ -			\$ 2,000
Balance		\$ -			\$ 4,000
Start-up & Warranty		\$ -			\$ 1,500
Material					\$ 54,150
Tax					\$ 4,061
Shop		144	48		\$ 6,912
Field		690	42		\$ 28,980
Supervision		69	46		\$ 3,174
Project Management		69	60		\$ 4,140
Tools and trucks					\$ 1,449
General Conditions					\$ 6,250
Sub Contracts					\$ 74,500
Sub-Total					\$ 183,616
Profit and Overhead			15%		\$ 27,542
Bond			1%		\$ 2,112
Design			8%		\$ 17,062
Total Cost					\$ 230,332

MAGTFTC Twentynine Palms Project 3
Building 1847

5/25/02

Description	Qty	Material	Shop	Field	Subs
Demolition	3	\$ 300	24	72	\$ 1,500
Structural Upgrad	3	\$ 750	16	64	\$ -
A/C units	3	\$ 22,000	12	48	\$ 1,500
Duct Furnaces	0	\$ -			\$ -
Zone Dampers	0	\$ -			\$ -
Duct Transitions	6	\$ 1,800	96	96	\$ -
New Duct & Grill	0	\$ -			\$ -
Condensate Piping	3	\$ 300		24	\$ -
Gas Piping	3	\$ 750		18	\$ -
CHW Piping	1	\$ 4,000		64	\$ -
Site Chilled Water	280	\$ 6,440		78.4	\$ 16,240
Electrical	3	\$ -			\$ 3,500
Controls	2	\$ -			\$ -
Roofing	3	\$ -			\$ 2,500
Cut & Patch	3	\$ -			\$ 2,000
Balance		\$ -			\$ 4,500
Start-up & Warranty		\$ -			\$ 1,500
Material					\$ 36,340
Tax					\$ 2,726
Shop		148	48		\$ 7,104
Field		464.4	42		\$ 19,505
Supervision		46.44	46		\$ 2,136
Project Management		46.44	60		\$ 2,786
Tools and trucks					\$ 975
General Conditions					\$ 6,250
Sub Contracts					\$ 33,240
Sub-Total					\$ 111,062
Profit and Overhead			15%		\$ 16,659
Bond			1%		\$ 1,277
Design			8%		\$ 10,320
Total Cost					\$ 139,319

MAGTFTC Twentynine Palms Project 3
Building 1848

5/25/02

Description	Qty	Material	Shop	Field	Subs
Pipe & Valves	ls	\$ 3,500		160	\$ 250
Coring		\$ -			\$ 300
Insulation		\$ -			\$ 1,250
Start-up & Commission		\$ 500		32	\$ 500
Balance		\$ -			\$ 1,200
Site Piping	400	\$ 13,000		140	\$ 23,200
Material					\$ 17,000
Tax		7.75%			\$ 1,318
Shop		0	56		\$ -
Field		332	46		\$ 15,272
Supervision		33.2	52		\$ 1,726
Tools&Trucks					\$ 764
Project Management			60		\$ -
General Conditions					\$ 6,250
Permits					\$ -
Sub- contracts					\$ 26,700
Sub-Total					\$ 69,030
Fee			15%		\$ 10,354
Bond			1%		\$ 794
Design			8%		\$ 6,414
Total cost					\$ 86,592

MAGTFTC Twentynine Palms Project 3
Building 1859

5/25/02

Description	Qty	Material	Shop	Field	Subs
Pipe & Valves	ls	\$ 3,500		160	\$ 250
Coring		\$ -			\$ 300
Insulation		\$ -			\$ 1,250
Start-up & Commission		\$ 500		32	\$ 500
Balance		\$ -			\$ 1,200
Bldg Piping	400	\$ 12,000		140	\$ 1,000
Material					\$ 16,000
Tax		7.75%			\$ 1,240
Shop		0	56		\$ -
Field		332	46		\$ 15,272
Supervision		33.2	52		\$ 1,726
Tools&Trucks					\$ 764
Project Management			60		\$ -
General Conditions			0.25	\$25,000	\$ 6,250
Permits					\$ -
Sub- Contracts					\$ 4,500
Sub-Total					\$ 45,752
Fee			15%		\$ 6,863
Bond			1%		\$ 526
Design			8%		\$ 4,251
Total cost					\$ 57,392

MAGTFTC Twentynine Palms Project 3
Building 1865

5/25/02

Description	Qty	Material	Shop	Field	Subs
Chilled Water	480	\$ 14,400		192	
Coil Connections	2	\$ 1,500		64	
Coils	2	\$ 17,500	32	48	\$ 1,500
Demolition	2	\$ 200		48	\$ 2,500
Insulation		\$ -			\$ 2,000
Balance Building					\$ 6,000
Site Piping	600	\$ 19,500		168	\$ 34,800
Material					\$ 53,100
Tax		7.75%			\$ 4,115
Shop		32	56		\$ 1,792
Field		520	42		\$ 21,840
Supervision		52	46		\$ 2,392
Tools&Trucks					\$ 1,092
General Conditions					\$ 6,250
Start-Up & Flushing					\$ 1,500
Sub-contracts					\$ 46,800
Sub-Total					\$ 138,881
Fee			15%		\$ 20,832
Design			8%		\$ 12,777
Contingency			0%		\$ -
Total cost					\$ 172,491

MAGTFTC Twentynine Palms Project 3

5/25/02

Buildi 1584

Description	Qty	Material	Shop	Field	Subs
Pipe & Valves	ls	\$ 3,500		160 \$	250
Coring		\$ -		\$	300
Insulation		\$ -		\$	1,250
Start-up & Commission		\$ 500		32 \$	500
Balance		\$ -		\$	1,200
Site Piping	100	\$ 3,250		35 \$	5,800
Material				\$	7,250
Tax		7.75%		\$	562
Shop		0	56	\$	-
Field		227	46	\$	10,442
Supervision		22.7	52	\$	1,180
Tools&Trucks				\$	522
Project Management			60	\$	-
General Conditions			0.25	\$25,000 \$	6,250
Permits				\$	-
Sub- contracts				\$	9,300
Sub-Total				\$	35,506
Fee			15%	\$	5,326
Bond			1%	\$	408
Design			8%	\$	3,299
Total cost				\$	44,540

Section 2B - Implementation Period ECM Cost		
ECSM 2	Energy Management Control System Upgrade	Total Cost
	Direct Construction Cost (Refer to Attached Subcontractor Cost Estimates for Construction Cost Detail)	
1.1.11	Johnson Controls Material and Labor	\$ 3,621,596
1.1.12	On-site EMCS Integration Specialist	\$ 328,907
1.1.13	this line unused	\$ -
1.1.14	this line unused	\$ -
1.1.15	Management Reserve	\$ 159,732
	Subtotal	\$ 4,110,235
1.1.81	Total System Commissioning	\$ -
1.1.82	Pre-Acceptance Measurement/Evaluation	\$ -
1.1.83	Manuf. Start-Up, Testing, Installn., Sequence	\$ -
1.1.84	Fire, Life Safety	\$ -
1.1.85	Inspection & Verification	\$ -
1.1.86	Graphics Software	\$ -
1.1.87	ATC Engg	\$ -
1.1.88	Travel	\$ -
1.1.89	Training (Johnson Controls Courses & On-site Training)	\$ -
	Subtotal	\$ -
1.1.91	Permits & Fees	\$ -
1.1.92	Insurance (material only)	\$ -
1.1.93	Performance and Payment Bond	\$ -
1.1.94	Office, Storage, Utilities, Supplies (600)	\$ -
1.1.95	Sales Tax (material only)	\$ -
1.1.96	Other: Clerical	\$ -
1.1.97	Freight	\$ -
1.1.99	Warranty	\$ 39,551
	Subtotal	\$ 39,551
	Total Direct Construction Cost	\$ 4,149,786
1.2	Direct Design/Management Costs	
1.2.11	Project Development	\$ -
1.2.12	Detailed Energy Survey/Preaward Design	\$ -
1.2.13	Post-award Project Design/Engineering	\$ -
1.2.14	Submittal Preparation, etc	\$ -
1.2.15	Project Startup/Mobilization	\$ -
1.2.21	Construction Supervision	\$ -
1.2.22	Project Documentation & O&M Manuals	\$ -
1.2.23	Quality Assurance	\$ -
1.2.24	Safety Compliance	\$ -
1.2.25	Project Management	\$ -
1.2.26	As-Built Drawings	\$ -
	Total Direct Design/Management Costs	\$ -
	ECSM Total Estimated Cost	\$ 4,149,786

ECSCM 2		Johnson Controls Material & Labor Cost Estimate			
Energy Management Control System Upgrade					
Item Description		Hours	Material Cost	Labor Cost	TOTAL
A. Group A Buildings including Central Plants - 1400 CP, 1600 CP, 1800 CP, 1400 INF, 1600 INF, 1800 INF, 1360, 1403, 1412, 1413, 1423, 1424, 1443, 1591, 1607, 1616, 1627, 1636, 1645					
GSA Catalog Material Price			\$ 584,749		\$ 584,749
Deduct - Convert GSA Price to Cost			(151,601)		\$ (151,601)
GSA Catalog Material Cost			\$ 433,147		\$ 433,147
Sales Tax	7.75%		\$ 45,318		\$ 45,318
Freight	0%		\$ -		\$ -
Vendor Material			\$ 54,035		\$ 54,035
Sales Tax	7.75%		\$ 4,188		\$ 4,188
Freight	5%		\$ 2,702		\$ 2,702
Material Sub-total			\$ 539,390		\$ 539,390
Subcontract - Graphics & Software					\$ 21,850
Subcontract - Controls Electrical					\$ 703,016
Subcontract - Mechanical Plumbing					\$ 69,000
Subcontract - Roofing					\$ 12,000
Facilities, Tools, Miscellaneous					\$ 875
Project Inspection & Verification		2916			\$ 187,850
Hardware Engineering		1336			\$ 91,102
Branch Engineering		216			\$ 14,729
Drafting		216			\$ 10,943
Customer Training					\$ -
Travel/Vehicles					\$ 34,231
Sub-total					\$ 1,684,986
B. Group B Buildings - 1541, 1542, 1549, 1552, 1584, 1825, 1826, 1828, 1831, 1833, 1839, 1843, 1847, 1848, 1859, 1865					
GSA Catalog Material Price			\$ 262,520		\$ 262,520
Deduct - Convert GSA Price to Cost			(68,061)		\$ (68,061)
GSA Catalog Material Cost			\$ 194,459		\$ 194,459
Sales Tax	7.75%		\$ 20,345		\$ 20,345
Freight	0%		\$ -		\$ -
Vendor Material			\$ 23,934		\$ 23,934
Sales Tax	7.75%		\$ 1,855		\$ 1,855
Freight	5%		\$ 1,197		\$ 1,197
Material Sub-total			\$ 241,790		\$ 241,790
Subcontract - Graphics & Software					\$ 13,650
Subcontract - Controls Electrical					\$ 396,498
Plumbing					\$ 44,400
Subcontract - Roofing					\$ 5,850
Facilities, Tools, Miscellaneous					\$ 411
Project Inspection & Verification		1369			\$ 88,236
Branch Engineering		64			\$ 4,364
Drafting		64			
Hardware Engineering		761			\$ 51,893
Customer Training					\$ -
Travel/Vehicles					\$ 21,272
Sub-total					\$ 868,364

C. Group (Other) Buildings - 1830, 1547, 1548, 1737, 1738, 1847, 1848, 1757, 1758					
<i>GSA Catalog Material Price</i>			\$ 256,757		\$ 256,757
<i>Deduct - Convert GSA Price to Cost</i>			(66,567)		\$ (66,567)
<i>GSA Catalog Material Cost</i>			\$ 190,190		\$ 190,190
<i>Sales Tax</i>	7.75%		\$ 19,899		\$ 19,899
<i>Freight</i>	0%		\$ -		\$ -
<i>Vendor Material</i>			\$ 34,337		\$ 34,337
<i>Sales Tax</i>	7.75%		\$ 2,661		\$ 2,661
<i>Freight</i>	5%		\$ 1,717		\$ 1,717
<i>Material Sub-total</i>			\$ 248,804		\$ 248,804
<i>Subcontract - Graphics & Software</i>					\$ 23,650
<i>Subcontract - Controls Electrical</i>					\$ 369,874
<i>Subcontract - Mechanical Plumbing</i>					\$ 74,000
<i>Subcontract - Roofing</i>					\$ 4,500
<i>Facilities, Tools, Miscellaneous</i>					\$ 394
<i>Project Inspection & Verification</i>		1312			\$ 84,538
<i>Branch Engineering</i>		40			\$ 2,728
<i>Drafting</i>		40			\$ 2,026
<i>Hardware Engineering</i>		717			\$ 48,892
<i>Customer Training</i>					\$ -
<i>Travel/Vehicles</i>					\$ 17,957
<i>Sub-total</i>					\$ 877,363
D. Add to Group A&B Buildings - Engineering, Commissioning and Training					
<i>Subcontract - Roofing</i>					\$ 1,200
<i>Facilities, Tools, Miscellaneous</i>					\$ 30,108
<i>Project Inspection & Verification</i>		360			\$ 23,195
<i>Branch Engineering</i>		2000			\$ 136,380
<i>Sub-total</i>					\$ 190,883
TOTAL for the ECSM					\$ 3,621,596

Section 2B - Implementation Period ECM Cost		
ECSM 3	1 MW Photovoltaic Solar Array	Total Cost
	Direct Construction Cost (Refer to Attached Subcontractor Cost Estimates for Construction Cost Detail)	
1.1.11	Johnson Controls Material and Labor	\$ -
1.1.12	PV Sub-Contractor	\$ 7,761,351
1.1.13	Electrical Subcontractor	\$ 477,800
1.1.14	Subcontractor Design (Elect, Struct, Civil)	\$ 55,000
1.1.15	Management Reserve	\$ 86,080
	Subtotal	\$ 8,380,231
1.1.81	Control System Commissioning	\$ 10,000
1.1.82	Pre-Acceptance Measurement/Evaluation	\$ -
1.1.83	Manuf. Start-Up, Testing, Installn., Sequence	\$ -
1.1.84	Fire, Life Safety	\$ -
1.1.85	Inspection & Verification	\$ 2,062
1.1.86	Graphics Software	\$ -
1.1.87	ATC Engg	\$ -
1.1.88	Travel	\$ -
1.1.89	Training (Johnson Controls Courses & On-site Training)	\$ -
	Subtotal	\$ 12,062
1.1.91	Permits & Fees	\$ -
1.1.92	Insurance (material only)	\$ -
1.1.93	Performance and Payment Bond	\$ -
1.1.94	Office, Storage, Utilities, Supplies	\$ -
1.1.95	Sales Tax (material only)	\$ -
1.1.96	Other: Clerical	\$ -
1.1.97	Freight	\$ -
1.1.99	Warranty	\$ -
	Subtotal	\$ -
	Total Direct Construction Cost	\$ 8,392,293
1.2	Direct Design/Management Costs Hours	
1.2.11	Project Development	\$ -
1.2.12	Detailed Energy Survey/Preaward Design	\$ -
1.2.13	Post-award Project Design/Engineering	\$ 25,000
1.2.14	Submittal Preparation	\$ -
1.2.15	Project Startup/Mobilization	\$ -
1.2.21	Construction Supervision	\$ -
1.2.22	Project Documentation & O&M Manuals	\$ -
1.2.23	Quality Assurance	\$ -
1.2.24	Safety Compliance	\$ -
1.2.25	Project Management	\$ -
1.2.26	As-Built Drawings	\$ -
	Total Direct Design/Management Costs	\$ 25,000
	ECSM Total Estimated Cost	\$ 8,417,293

ECSM 3	Subcontractor Material & Labor Cost Estimate		
1 MW Photovoltaic Solar Array			
Item Description	Type	Quantity	Total
			\$ -
PV Modules	BP SX 150 - 150 watt	8604	\$ 3,753,368
Inverter Systems	Xantrex PV 100208	13	\$ 789,768
Tracking System Structure	MaxTracker™	1	\$ 985,361
Data Acquisition System	Custom	1	\$ 39,493
Other System Materials	Various		\$ 73,280
Design and Engineering			\$ 136,177
Construction Supervision and Management			\$ 20,052
Construction Costs			\$ 1,342,548
O&M Training			\$ 4,900
General Contingency			\$ -
Shipping			\$ 179,206
Sales Tax @ 7.75% on Net Equipment Cost (1)			\$ 437,198
			\$ -
			\$ -
			\$ -
			\$ -
			\$ -
			\$ -
			\$ -
			\$ -
			\$ -
			\$ -
			\$ -
			\$ -
			\$ -
			\$ -
Totals			\$ 7,761,351

Section 2B - Implementation Period ECM Cost		
ECSM 4	Skylights and Daylighting Control	Total Cost
	Direct Construction Cost (Refer to Attached Subcontractor Cost Estimates for Construction Cost Detail)	
1.1.11	Johnson Controls Material and Labor	\$ -
1.1.12	Lighting Sub-Contractor	\$ 531,000
1.1.13	this line unused	\$ -
1.1.14	this line unused	\$ -
1.1.15	Management Reserve	\$ 21,240
	Subtotal	\$ 552,240
1.1.81	Total System Commissioning	\$ -
1.1.82	Pre-Acceptance Measurement/Evaluation	\$ -
1.1.83	Manuf. Start-Up, Testing, Installn., Sequence	\$ -
1.1.84	Fire, Life Safety	\$ -
1.1.85	Inspection & Verification	\$ -
1.1.86	Graphics Software	\$ -
1.1.87	ATC Engg	\$ -
1.1.88	Travel	\$ -
1.1.89	Training (Johnson Controls Courses & On-site Training)	\$ -
	Subtotal	\$ -
1.1.91	Permits & Fees	\$ -
1.1.92	Insurance (material only)	\$ -
1.1.93	Performance and Payment Bond	\$ -
1.1.94	Office, Storage, Utilities, Supplies (600)	\$ -
1.1.95	Sales Tax (material only)	\$ -
1.1.96	Other: Clerical	\$ -
1.1.97	Freight	\$ -
1.1.99	Warranty	\$ -
	Subtotal	\$ -
	Total Direct Construction Cost	\$ 552,240
1.2	Direct Design/Management Costs Hours	
1.2.11	Project Development	\$ -
1.2.12	Detailed Energy Survey/Preaward Design	\$ -
1.2.13	Post-award Project Design/Engineering	\$ -
1.2.14	Submittal Preparation	\$ -
1.2.15	Project Startup/Mobilization	\$ -
1.2.21	Construction Supervision	\$ -
1.2.22	Project Documentation & O&M Manuals	\$ -
1.2.23	Quality Assurance	\$ -
1.2.24	Safety Compliance	\$ -
1.2.25	Project Management	\$ -
1.2.26	As-Built Drawings	\$ -
	Total Direct Design/Management Costs	\$ -
	ECSM Total Estimated Cost	\$ 552,240

ECSM 4		Lighting Subcontractor Material & Labor Cost Estimate			
Skylights and Daylighting Control					
Item Description	Quantity	Material	Labor	Overhead & Profit	TOTAL
Provide at the locations shown below - (320) 4x4 daylighting units with daylighting units with controls - Clear Prismatic Dome, Aluminium Frame & Retainer, Sheet Metal Roof Curb with Integral Security Grill, Polar-White Aluminium Light-Well, Interior Diff					
Modify Existing Lighting Circuits and Furnish controls to allow existing light levels to be adjusted to accommodate the daylighting being provided					
Included - Daylighting Design, Standard 1 Year Warranty on Installation, Existing Roof Warranty matched, Roof Penetrations guaranteed, Review of Penetrations by a licensed Structural Engineer retained by installing subcontractor					
Refer to Technical Proposal ECSM Description for a detailed list of Inclusions & Exclusions					
Building 1102	75	\$ 52,800	\$ 53,088	\$ 14,112	\$ 120,000
Building 1317	25	\$ 17,600	\$ 17,696	\$ 4,704	\$ 40,000
Building 1337	28	\$ 19,712	\$ 19,820	\$ 5,268	\$ 44,800
Building 1350	34	\$ 23,936	\$ 24,067	\$ 6,397	\$ 54,400
Building 1816	26	\$ 18,304	\$ 18,404	\$ 4,892	\$ 41,600
Building 1817	8	\$ 5,632	\$ 5,663	\$ 1,505	\$ 12,800
Building 1920	20	\$ 14,080	\$ 14,157	\$ 3,763	\$ 32,000
Building 1954	20	\$ 14,080	\$ 14,157	\$ 3,763	\$ 32,000
Building 1980	26	\$ 18,304	\$ 18,404	\$ 4,892	\$ 41,600
Building 2020	22	\$ 15,488	\$ 15,572	\$ 4,140	\$ 35,200
Building 2044	20	\$ 14,080	\$ 14,157	\$ 3,763	\$ 32,000
Building 2054	16	\$ 11,264	\$ 11,325	\$ 3,011	\$ 25,600
					\$ -
Bond, Temporary Facilities, Cutting, Framing, Painting, Patching, etc.	320				\$ 19,000
					\$ -
Totals	640	\$ 225,280	\$ 226,510	\$ 60,210	\$ 531,000

NIST BLCC 5.0-01: Comparative Analysis

Consistent with Federal Life Cycle Cost Methodology and Procedures, 10 CFR, Part 436, Subpart A

Base Case: Existing System - Do Nothing**Alternative: ESPC****General Information**

File Name: d:\data\programs\blcc\projects\29 Palms EJP3 mj.xml
 Run Date: Wed Sep 25 16:56:59 PDT 2002
 Project Name: 29 Palms FP 3
 Project Location: California
 Analysis Type: Federal Analysis, Financed Project
 Analyst: Rick Otta
 Base Date of Study: October 1, 2002
 Service Date: October 1, 2002
 Study Period: 25 years 0 months(October 1, 2002 through September 30, 2027)
 Discount Rate: 3.2%
 Discounting Convention: End-of-Year

Comparison of Present-Value Costs**PV Life-Cycle Cost**

	Base Case	Alternative	Savings from Alternative
Initial Investment Costs Paid By Agency:			
Capital Requirements as of Base Date	\$0	\$9,562,601	-\$9,562,601
Future Costs:			
Recurring and Non-Recurring Contract Costs	\$0	\$108,390,138	-\$108,390,138
Energy Consumption Costs	\$209,794,063	\$98,882,434	\$110,911,630
Energy Demand Charges	\$0	\$0	\$0
Energy Utility Rebates	\$0	\$0	\$0
Water Costs	\$0	\$64,328	-\$64,328
Recurring and Non-Recurring OM&R Costs	\$0	\$0	\$0
Capital Replacements	\$0	\$0	\$0
Residual Value at End of Study Period	\$0	-\$8,223,804	\$8,223,804
	-----	-----	-----
Subtotal (for Future Cost Items)	\$209,794,063	\$199,113,095	\$10,680,968
	-----	-----	-----
Total PV Life-Cycle Cost	\$209,794,063	\$208,675,696	\$1,118,367

Net Savings from Alternative Compared with Base Case

PV of Operational Savings	\$110,847,302
- PV of Differential Costs	\$109,728,934

Net Savings	\$1,118,367

NOTE: Meaningful SIR, AIRR and Payback can not be computed for Financed Projects.

Comparison of Contract Payments and Savings from Alternative (undiscounted)

Year Beginning	Savings in Contract Costs	Savings in Energy Costs	Savings in Total Operational Costs	Savings in Total Costs
Oct 2002	-\$1,361,862	\$7,681,232	\$7,678,665	-\$3,245,797
Oct 2003	-\$5,506,450	\$7,468,880	\$7,466,224	\$1,959,774
Oct 2004	-\$6,532,732	\$7,155,267	\$7,152,518	\$619,786
Oct 2005	-\$6,973,972	\$6,815,494	\$6,812,649	-\$161,324
Oct 2004	-\$7,107,083	\$6,518,729	\$6,515,785	-\$591,298
Oct 2007	-\$7,243,110	\$6,382,844	\$6,379,796	-\$863,313
Oct 2008	-\$7,381,358	\$6,285,164	\$6,282,010	-\$1,099,347
Oct 2009	-\$7,522,244	\$6,196,056	\$6,192,792	-\$1,329,452
Oct 2010	-\$7,665,820	\$6,135,530	\$6,132,152	-\$1,533,667
Oct 2011	-\$7,812,540	\$6,112,046	\$6,108,551	-\$1,703,989
Oct 2012	-\$7,961,657	\$6,169,234	\$6,165,617	-\$1,796,040
Oct 2013	-\$8,113,619	\$6,227,975	\$6,224,232	-\$1,889,388
Oct 2014	-\$8,268,482	\$6,249,257	\$6,245,383	-\$2,023,100
Oct 2015	-\$8,426,738	\$6,302,285	\$6,298,275	-\$2,128,463
Oct 2016	-\$8,587,577	\$6,337,600	\$6,333,451	-\$2,254,126
Oct 2017	-\$8,751,487	\$6,308,922	\$6,304,628	-\$2,446,858
Oct 2018	-\$8,918,525	\$6,302,296	\$6,297,852	-\$2,620,673
Oct 2019	-\$9,089,221	\$6,326,618	\$6,322,019	-\$2,767,203
Oct 2020	-\$9,262,706	\$6,338,098	\$6,333,339	-\$2,929,367
Oct 2021	-\$9,439,501	\$6,342,102	\$6,337,176	-\$3,102,325
Oct 2022	-\$2,425,782	\$6,343,973	\$6,338,876	\$3,913,093
Oct 2023	\$0	\$6,345,849	\$6,340,574	\$6,340,574
Oct 2024	\$0	\$6,349,836	\$6,344,377	\$6,344,377
Oct 2025	\$0	\$6,353,840	\$6,348,190	\$6,348,190
Oct 2026	\$0	\$6,355,706	\$6,349,860	\$24,422,366

Energy Savings Summary

Energy Savings Summary (in stated units)

Energy Type	-----Average Base Case	Annual Alternative	Consumption----- Savings	Life-Cycle Savings
Electricity	84,596,592.0 kWh	22,523,727.0 kWh	62,072,865.0 kWh	1,551,609,192.2 kWh
Natural Gas	4,072,190.0 Therm	7,931,623.0 Therm	-3,859,433.0 Therm	-96,472,616.8 Therm

Energy Savings Summary (in MBtu)

Energy Type	-----Average Base Case	Annual Alternative	Consumption----- Savings	Life-Cycle Savings
Electricity	288,655.5 MBtu	76,854.1 MBtu	211,801.4 MBtu	5,294,309.1 MBtu
Natural Gas	407,220.5 MBtu	793,165.3 MBtu	-385,944.8 MBtu	-9,647,298.0 MBtu

Emissions Reduction Summary

Energy Type	-----Average Base Case	Annual Alternative	Emissions----- Reduction	Life-Cycle Reduction
Electricity				
CO2	49,981,297.47 kg	13,307,452.14 kg	36,673,845.33 kg	916,720,623.84 kg
SO2	7,306.73 kg	1,945.41 kg	5,361.33 kg	134,014.82 kg
NOx	128,536.74 kg	34,222.73 kg	94,314.01 kg	2,357,527.41 kg
Natural Gas				
CO2	21,510,748.38 kg	41,897,639.02 kg	-20,386,890.63 kg	-509,602,495.52 kg
SO2	173,598.53 kg	338,127.17 kg	-164,528.64 kg	-4,112,652.98 kg
NOx	3,007.90 kg	5,858.64 kg	-2,850.74 kg	-71,258.84 kg
Total:				
CO2	71,492,045.85 kg	55,205,091.16 kg	16,286,954.70 kg	407,118,128.32 kg
SO2	180,905.26 kg	340,072.58 kg	-159,167.32 kg	-3,978,638.16 kg
NOx	131,544.63 kg	40,081.37 kg	91,463.26 kg	2,286,268.57 kg

Effect of Cash Contributions on Construction Loan Draw Down.

		Johnson Controls Financed Cash Requirements		Non-Financed Cash Contributions		Johnson Controls Monthly Cash Requirements	
Month	Date	Construction Period Draw Down Schedule		Total	\$ 10,937,057.30	Capital Investment	\$ 51,008,207.00
		Draw Down Schedule (%)	Draw Down Schedule	Amount		Draw Down Schedule (%)	Draw Down Schedule
1	Oct-02	0.00%	\$ -	\$	4,149,526.68	5.30%	\$ 2,703,434.97
2	Nov-02	0.00%	\$ -	\$	-	1.70%	\$ 867,139.52
3	Dec-02	0.00%	\$ -	\$	1,862,118.09	1.40%	\$ 714,114.90
4	Jan-03	0.00%	\$ -	\$	-	1.30%	\$ 663,106.69
5	Feb-03	0.00%	\$ -	\$	-	1.80%	\$ 918,147.73
6	Mar-03	3.88%	\$ 1,556,645.34	\$	644,031.22	4.60%	\$ 2,346,377.52
7	Apr-03	9.29%	\$ 3,723,599.11	\$	-	7.30%	\$ 3,723,599.11
8	May-03	9.17%	\$ 3,672,590.90	\$	-	7.20%	\$ 3,672,590.90
9	Jun-03	8.57%	\$ 3,435,209.99	\$	390,405.54	7.50%	\$ 3,825,615.53
10	Jul-03	15.28%	\$ 6,120,984.84	\$	-	12.00%	\$ 6,120,984.84
11	Aug-03	13.88%	\$ 5,559,894.56	\$	-	10.90%	\$ 5,559,894.56
12	Sep-03	6.26%	\$ 2,506,526.40	\$	1,574,130.16	8.00%	\$ 4,080,656.56
13	Oct-03	8.66%	\$ 3,468,558.08	\$	-	6.80%	\$ 3,468,558.08
14	Nov-03	2.55%	\$ 1,020,164.14	\$	-	2.00%	\$ 1,020,164.14
15	Dec-03	2.34%	\$ 937,879.95	\$	82,284.19	2.00%	\$ 1,020,164.14
16	Jan-04	4.71%	\$ 1,887,303.66	\$	-	3.70%	\$ 1,887,303.66
17	Feb-04	4.58%	\$ 1,836,295.45	\$	-	3.60%	\$ 1,836,295.45
18	Mar-04	0.00%	\$ -	\$	1,989,426.05	2.60%	\$ 1,326,213.38
19	Apr-04	0.89%	\$ 356,951.47	\$	-	2.00%	\$ 1,020,164.14
20	May-04	2.55%	\$ 1,020,164.14	\$	-	2.00%	\$ 1,020,164.14
21	Jun-04	1.96%	\$ 784,323.69	\$	82,815.83	1.70%	\$ 867,139.52
22	Jul-04	1.40%	\$ 561,090.28	\$	-	1.10%	\$ 561,090.28
23	Aug-04	0.89%	\$ 357,057.45	\$	-	0.70%	\$ 357,057.45
24	Sep-04	0.68%	\$ 274,241.62	\$	82,815.83	0.70%	\$ 357,057.45
25	Oct-04	0.51%	\$ 204,032.83	\$	-	0.40%	\$ 204,032.83
26	Nov-04	0.51%	\$ 204,032.83	\$	-	0.40%	\$ 204,032.83
27	Dec-04	1.46%	\$ 583,602.99	\$	79,503.71	1.30%	\$ 663,106.69
Total Drawn		100.00%	\$ 40,071,149.70	\$	10,937,057.30	100.00%	\$ 51,008,207.00

Summary of Project 2 and 3 Financing

Project II (Cogeneration)		Project III	
Index(10 Year Swap)	5.64%	Index(20 Year Swap)	5.02%
Spread	1.80%	Spread	2.04%
	7.44%		7.06%
		Effective Annual Interest Rate	7.29%
TL Premium	5.00%	TL Premium	5.00%
Reinvestment	2.00%	Reinvestment	1.50%
Project Cost	\$ 16,158,073.00	Project Cost	\$ 51,008,207.00
Less: Misc	\$ -	Less: Constr. Savings	\$ (10,937,057.30)
Total Project Cost	\$ 16,158,073.00	Total Project Cost	\$ 40,071,149.70
IDC	\$ 2,059,674.09	IDC	\$ 6,452,791.87
Total Financed	\$ 18,217,747.09	Total Financed	\$ 46,523,941.57
		Total Fin. II and III	\$ 64,741,688.66

Calculation of Project 2 and Project 3 Interest During Construction Charges

Period	Date	Project II Net Interest	Project III Net Interest	Project II(mod) Total IDC	Project III Construction Calcs					
					Interest Paid	Interest Earned	Draw Amount	Draw Percentage	Cum. Draws	Balance
1	10/1/01									
2	11/1/01	\$ 85,280.13	\$ -	\$ 85,280.13				0.00%	0.00%	
3	12/1/01	\$ 86,768.77	\$ -	\$ 86,768.77				0.00%	0.00%	
4	1/1/02	\$ 86,913.39	\$ -	\$ 86,913.39				0.00%	0.00%	
5	2/1/02	\$ 88,404.75	\$ -	\$ 88,404.75				0.00%	0.00%	
6	3/1/02	\$ 96,631.13	\$ -	\$ 96,631.13				0.00%	0.00%	
7	4/1/02	\$ 96,792.18	\$ -	\$ 96,792.18				0.00%	0.00%	
8	5/1/02	\$ 96,953.50	\$ -	\$ 96,953.50				0.00%	0.00%	
9	6/1/02	\$ 103,847.62	\$ -	\$ 103,847.62				0.00%	0.00%	
10	7/1/02	\$ 105,367.20	\$ -	\$ 105,367.20				0.00%	0.00%	
11	8/1/02	\$ 106,889.32	\$ -	\$ 106,889.32				0.00%	0.00%	
12	9/1/02	\$ 108,413.98	\$ -	\$ 108,413.98				0.00%	0.00%	
13	10/1/02	\$ 108,594.67	\$ -	\$ 108,594.67			\$ -	0.00%	0.00%	\$ 46,523,941.57
14	11/1/02	\$ 108,775.66	\$ 215,560.93	\$ 324,336.59	\$ 273,715.86	\$ 58,154.93	\$ -	0.00%	0.00%	\$ 46,308,380.64
15	12/1/02	\$ 110,303.46	\$ 215,830.38	\$ 326,133.84	\$ 273,715.86	\$ 57,885.48	\$ -	0.00%	0.00%	\$ 46,092,550.26
16	1/1/03	\$ 110,487.30	\$ 216,100.17	\$ 326,587.46	\$ 273,715.86	\$ 57,615.69	\$ -	0.00%	0.00%	\$ 45,876,450.09
17	2/1/03	\$ 110,671.44	\$ 216,370.29	\$ 327,041.73	\$ 273,715.86	\$ 57,345.56	\$ -	0.00%	0.00%	\$ 45,660,079.80
18	3/1/03	\$ 110,855.89	\$ 216,640.76	\$ 327,496.65	\$ 273,715.86	\$ 57,075.10	\$ 1,556,645.34	3.88%	3.88%	\$ 43,886,793.70
19	4/1/03	\$ 112,387.16	\$ 218,857.36	\$ 331,244.52	\$ 273,715.86	\$ 54,858.49	\$ 3,723,599.11	9.29%	13.18%	\$ 39,944,337.23
20	5/1/03	\$ 112,574.47	\$ 223,785.43	\$ 336,359.91	\$ 273,715.86	\$ 49,930.42	\$ 3,672,590.90	9.17%	22.34%	\$ 36,047,960.89
21	6/1/03	\$ 112,762.10	\$ 228,655.91	\$ 341,418.00	\$ 273,715.86	\$ 45,059.95	\$ 3,435,209.99	8.57%	30.92%	\$ 32,384,095.00
22	7/1/03	\$ -	\$ 233,235.74	\$ 233,235.74	\$ 273,715.86	\$ 40,480.12	\$ 6,120,984.84	15.28%	46.19%	\$ 26,029,874.42
23	8/1/03	\$ -	\$ 241,178.51	\$ 241,178.51	\$ 273,715.86	\$ 32,537.34	\$ 5,559,894.56	13.88%	60.07%	\$ 20,228,801.35
24	9/1/03	\$ -	\$ 248,429.85	\$ 248,429.85	\$ 273,715.86	\$ 25,286.00	\$ 2,506,526.40	6.26%	66.32%	\$ 17,473,845.09
25	10/1/03	\$ -	\$ 251,873.55	\$ 251,873.55	\$ 273,715.86	\$ 21,842.31	\$ 3,468,558.08	8.66%	74.98%	\$ 13,753,413.47
26	11/1/03	\$ -	\$ 256,524.09	\$ 256,524.09	\$ 273,715.86	\$ 17,191.77	\$ 1,020,164.14	2.55%	77.52%	\$ 12,476,725.24
27	12/1/03	\$ -	\$ 258,119.95	\$ 258,119.95	\$ 273,715.86	\$ 15,595.91	\$ 937,879.95	2.34%	79.86%	\$ 11,280,725.34
28	1/1/04	\$ -	\$ 259,614.95	\$ 259,614.95	\$ 273,715.86	\$ 14,100.91	\$ 1,887,303.66	4.71%	84.57%	\$ 9,133,806.73
29	2/1/04	\$ -	\$ 262,298.60	\$ 262,298.60	\$ 273,715.86	\$ 11,417.26	\$ 1,836,295.45	4.58%	89.16%	\$ 7,035,212.68
30	3/1/04	\$ -	\$ 264,921.84	\$ 264,921.84	\$ 273,715.86	\$ 8,794.02	\$ -	0.00%	89.16%	\$ 6,770,290.84
31	4/1/04	\$ -	\$ 265,252.99	\$ 265,252.99	\$ 273,715.86	\$ 8,462.86	\$ 356,951.47	0.89%	90.05%	\$ 6,148,086.38
32	5/1/04	\$ -	\$ 266,030.75	\$ 266,030.75	\$ 273,715.86	\$ 7,685.11	\$ 1,020,164.14	2.55%	92.59%	\$ 4,861,891.49
33	6/1/04	\$ -	\$ 267,638.49	\$ 267,638.49	\$ 273,715.86	\$ 6,077.36	\$ 784,323.69	1.96%	94.55%	\$ 3,809,929.31
34	7/1/04	\$ -	\$ 268,953.44	\$ 268,953.44	\$ 273,715.86	\$ 4,762.41	\$ 561,090.28	1.40%	95.95%	\$ 2,979,885.59
35	8/1/04	\$ -	\$ 269,991.00	\$ 269,991.00	\$ 273,715.86	\$ 3,724.86	\$ 357,057.45	0.89%	96.84%	\$ 2,352,837.14
36	9/1/04	\$ -	\$ 270,774.81	\$ 270,774.81	\$ 273,715.86	\$ 2,941.05	\$ 274,241.62	0.68%	97.53%	\$ 1,807,820.71
37	10/1/04	\$ -	\$ 271,456.08	\$ 271,456.08	\$ 273,715.86	\$ 2,259.78	\$ 204,032.83	0.51%	98.03%	\$ 1,332,331.80
38	11/1/04	\$ -	\$ 272,050.44	\$ 272,050.44	\$ 273,715.86	\$ 1,665.41	\$ 204,032.83	0.51%	98.54%	\$ 856,248.53
39	12/1/04	\$ -	\$ 272,645.55	\$ 272,645.55	\$ 273,715.86	\$ 1,070.31	\$ 583,602.99	1.46%	100.00%	\$ (0.00)
Totals		\$ 2,059,674.09	\$ 6,452,791.87	\$ 8,512,465.96	\$ 7,116,612.26	\$ 663,820.39	\$ 40,071,149.70	100.00%		

Annual Energy Savings Support Calculation

Year	Period	Electricity	Natural Gas	O&M (incl. Water)	Total Estimated	Total Guaranteed Savings	Yearly Escalation
2002	1	\$ 8,486,333.72	\$ (1,519,550.00)	\$ (3,106.00)	\$ 6,963,677.72	\$ 6,199,577.62	
2003	2	\$ 8,678,648.73	\$ (1,574,676.14)	\$ (3,213.47)	\$ 7,100,759.13	\$ 6,321,617.55	1.9685%
2004	3	\$ 8,875,321.94	\$ (1,631,802.14)	\$ (3,324.65)	\$ 7,240,195.14	\$ 6,445,753.74	1.9637%
2005	4	\$ 9,076,452.09	\$ (1,691,000.56)	\$ (3,439.69)	\$ 7,382,011.84	\$ 6,572,009.39	1.9587%
2006	5	\$ 9,282,140.20	\$ (1,752,346.58)	\$ (3,558.70)	\$ 7,526,234.93	\$ 6,700,407.38	1.9537%
2007	6	\$ 9,492,489.57	\$ (1,815,918.10)	\$ (3,681.83)	\$ 7,672,889.64	\$ 6,830,970.18	1.9486%
2008	7	\$ 9,707,605.81	\$ (1,881,795.86)	\$ (3,809.22)	\$ 7,822,000.73	\$ 6,963,719.82	1.9433%
2009	8	\$ 9,927,596.96	\$ (1,950,063.53)	\$ (3,941.02)	\$ 7,973,592.40	\$ 7,098,677.87	1.9380%
2010	9	\$ 10,152,573.49	\$ (2,020,807.82)	\$ (4,077.38)	\$ 8,127,688.29	\$ 7,235,865.35	1.9326%
2011	10	\$ 10,382,648.37	\$ (2,094,118.56)	\$ (4,218.46)	\$ 8,284,311.36	\$ 7,375,302.72	1.9270%
2012	11	\$ 10,617,937.16	\$ (2,170,088.86)	\$ (4,364.42)	\$ 8,443,483.88	\$ 7,517,009.79	1.9214%
2013	12	\$ 10,858,557.99	\$ (2,248,815.21)	\$ (4,515.43)	\$ 8,605,227.35	\$ 7,661,005.72	1.9156%
2014	13	\$ 11,104,631.71	\$ (2,330,397.59)	\$ (4,671.66)	\$ 8,769,562.46	\$ 7,807,308.90	1.9097%
2015	14	\$ 11,356,281.88	\$ (2,414,939.61)	\$ (4,833.30)	\$ 8,936,508.97	\$ 7,955,936.96	1.9037%
2016	15	\$ 11,613,634.88	\$ (2,502,548.64)	\$ (5,000.53)	\$ 9,106,085.71	\$ 8,106,906.63	1.8976%
2017	16	\$ 11,876,819.95	\$ (2,593,335.94)	\$ (5,173.55)	\$ 9,278,310.46	\$ 8,260,233.76	1.8913%
2018	17	\$ 12,145,969.24	\$ (2,687,416.83)	\$ (5,352.55)	\$ 9,453,199.87	\$ 8,415,933.16	1.8849%
2019	18	\$ 12,421,217.93	\$ (2,784,910.77)	\$ (5,537.75)	\$ 9,630,769.41	\$ 8,574,018.62	1.8784%
2020	19	\$ 12,702,704.23	\$ (2,885,941.59)	\$ (5,729.36)	\$ 9,811,033.28	\$ 8,734,502.76	1.8717%
2021	20	\$ 12,990,569.49	\$ (2,990,637.60)	\$ (5,927.59)	\$ 9,994,004.30	\$ 8,897,397.01	1.8650%
2022	21	\$ 13,284,958.28	\$ (3,099,131.76)	\$ (6,132.69)	\$10,179,693.82	\$ 9,062,711.47	1.8580%
2023	22	\$ 13,586,018.42	\$ (3,211,561.87)	\$ (6,344.88)	\$10,368,111.67	\$ 9,230,454.88	1.8509%
2024	23	\$ 13,893,901.12	\$ (3,328,070.72)	\$ (6,564.41)	\$10,559,265.99	\$ 9,400,634.50	1.8437%
2025	24	\$ 14,208,760.96	\$ (3,448,806.26)	\$ (6,791.54)	\$10,753,163.16	\$ 9,573,256.01	1.8363%
2026	25	\$ 14,530,756.08	\$ (3,573,921.84)	\$ (7,026.53)	\$10,949,807.71	\$ 9,748,323.44	1.8287%

Note: All escalations assumed to occur on January of each Year.

Individual ESCM Monthly Escalation Savings Details

Year	Month - Year	Period	ECSCM 1 Air Conditioning	ECSCM 2 EMCS	ECSCM 3 PV Array	ECSCM 4 Skylights	Project II - Cogeneration	Total
2002	Oct-02	1	\$ 34,318.51	\$ 15,597.81	\$ 21,627.64	\$ 4,923.33	\$ 440,164.17	\$ 516,631.47
2002	Nov-02	2	\$ 34,318.51	\$ 15,597.81	\$ 21,627.64	\$ 4,923.33	\$ 440,164.17	\$ 516,631.47
2002	Dec-02	3	\$ 34,318.51	\$ 15,597.81	\$ 21,627.64	\$ 4,923.33	\$ 440,164.17	\$ 516,631.47
2003	Jan-03	4	\$ 34,994.08	\$ 15,904.86	\$ 22,053.39	\$ 5,020.25	\$ 440,164.17	\$ 518,136.74
2003	Feb-03	5	\$ 34,994.08	\$ 15,904.86	\$ 22,053.39	\$ 5,020.25	\$ 440,164.17	\$ 518,136.74
2003	Mar-03	6	\$ 34,994.08	\$ 15,904.86	\$ 22,053.39	\$ 5,020.25	\$ 440,164.17	\$ 518,136.74
2003	Apr-03	7	\$ 34,994.08	\$ 15,904.86	\$ 22,053.39	\$ 5,020.25	\$ 440,164.17	\$ 518,136.74
2003	May-03	8	\$ 34,994.08	\$ 15,904.86	\$ 22,053.39	\$ 5,020.25	\$ 440,164.17	\$ 518,136.74
2003	Jun-03	9	\$ 34,994.08	\$ 15,904.86	\$ 22,053.39	\$ 5,020.25	\$ 440,164.17	\$ 518,136.74
2003	Jul-03	10	\$ 34,994.08	\$ 15,904.86	\$ 22,053.39	\$ 5,020.25	\$ 440,164.17	\$ 518,136.74
2003	Aug-03	11	\$ 34,994.08	\$ 15,904.86	\$ 22,053.39	\$ 5,020.25	\$ 440,164.17	\$ 518,136.74
2003	Sep-03	12	\$ 34,994.08	\$ 15,904.86	\$ 22,053.39	\$ 5,020.25	\$ 440,164.17	\$ 518,136.74
2003	Oct-03	13	\$ 34,994.08	\$ 15,904.86	\$ 22,053.39	\$ 5,020.25	\$ 440,164.17	\$ 518,136.74
2003	Nov-03	14	\$ 34,994.08	\$ 15,904.86	\$ 22,053.39	\$ 5,020.25	\$ 440,164.17	\$ 518,136.74
2003	Dec-03	15	\$ 34,994.08	\$ 15,904.86	\$ 22,053.39	\$ 5,020.25	\$ 440,164.17	\$ 518,136.74
2004	Jan-04	16	\$ 35,681.25	\$ 16,217.18	\$ 22,486.44	\$ 5,118.83	\$ 448,977.72	\$ 528,481.42
2004	Feb-04	17	\$ 35,681.25	\$ 16,217.18	\$ 22,486.44	\$ 5,118.83	\$ 448,977.72	\$ 528,481.42
2004	Mar-04	18	\$ 35,681.25	\$ 16,217.18	\$ 22,486.44	\$ 5,118.83	\$ 448,977.72	\$ 528,481.42
2004	Apr-04	19	\$ 35,681.25	\$ 16,217.18	\$ 22,486.44	\$ 5,118.83	\$ 448,977.72	\$ 528,481.42
2004	May-04	20	\$ 35,681.25	\$ 16,217.18	\$ 22,486.44	\$ 5,118.83	\$ 448,977.72	\$ 528,481.42
2004	Jun-04	21	\$ 35,681.25	\$ 16,217.18	\$ 22,486.44	\$ 5,118.83	\$ 448,977.72	\$ 528,481.42
2004	Jul-04	22	\$ 35,681.25	\$ 16,217.18	\$ 22,486.44	\$ 5,118.83	\$ 448,977.72	\$ 528,481.42
2004	Aug-04	23	\$ 35,681.25	\$ 16,217.18	\$ 22,486.44	\$ 5,118.83	\$ 448,977.72	\$ 528,481.42
2004	Sep-04	24	\$ 35,681.25	\$ 16,217.18	\$ 22,486.44	\$ 5,118.83	\$ 448,977.72	\$ 528,481.42
2004	Oct-04	25	\$ 35,681.25	\$ 16,217.18	\$ 22,486.44	\$ 5,118.83	\$ 448,977.72	\$ 528,481.42
2004	Nov-04	26	\$ 35,681.25	\$ 16,217.18	\$ 22,486.44	\$ 5,118.83	\$ 448,977.72	\$ 528,481.42
2004	Dec-04	27	\$ 35,681.25	\$ 16,217.18	\$ 22,486.44	\$ 5,118.83	\$ 448,977.72	\$ 528,481.42
2005	Jan-05	28	\$ 36,380.15	\$ 16,534.83	\$ 22,926.90	\$ 5,219.10	\$ 457,772.03	\$ 538,833.01
2005	Feb-05	29	\$ 36,380.15	\$ 16,534.83	\$ 22,926.90	\$ 5,219.10	\$ 457,772.03	\$ 538,833.01
2005	Mar-05	30	\$ 36,380.15	\$ 16,534.83	\$ 22,926.90	\$ 5,219.10	\$ 457,772.03	\$ 538,833.01
2005	Apr-05	31	\$ 36,380.15	\$ 16,534.83	\$ 22,926.90	\$ 5,219.10	\$ 457,772.03	\$ 538,833.01
2005	May-05	32	\$ 36,380.15	\$ 16,534.83	\$ 22,926.90	\$ 5,219.10	\$ 457,772.03	\$ 538,833.01
2005	Jun-05	33	\$ 36,380.15	\$ 16,534.83	\$ 22,926.90	\$ 5,219.10	\$ 457,772.03	\$ 538,833.01
2005	Jul-05	34	\$ 36,380.15	\$ 16,534.83	\$ 22,926.90	\$ 5,219.10	\$ 457,772.03	\$ 538,833.01
2005	Aug-05	35	\$ 36,380.15	\$ 16,534.83	\$ 22,926.90	\$ 5,219.10	\$ 457,772.03	\$ 538,833.01
2005	Sep-05	36	\$ 36,380.15	\$ 16,534.83	\$ 22,926.90	\$ 5,219.10	\$ 457,772.03	\$ 538,833.01
2005	Oct-05	37	\$ 36,380.15	\$ 16,534.83	\$ 22,926.90	\$ 5,219.10	\$ 457,772.03	\$ 538,833.01
2005	Nov-05	38	\$ 36,380.15	\$ 16,534.83	\$ 22,926.90	\$ 5,219.10	\$ 457,772.03	\$ 538,833.01
2005	Dec-05	39	\$ 36,380.15	\$ 16,534.83	\$ 22,926.90	\$ 5,219.10	\$ 457,772.03	\$ 538,833.01
2006	Jan-06	40	\$ 37,090.92	\$ 16,857.87	\$ 23,374.82	\$ 5,321.06	\$ 466,715.57	\$ 549,360.24
2006	Feb-06	41	\$ 37,090.92	\$ 16,857.87	\$ 23,374.82	\$ 5,321.06	\$ 466,715.57	\$ 549,360.24
2006	Mar-06	42	\$ 37,090.92	\$ 16,857.87	\$ 23,374.82	\$ 5,321.06	\$ 466,715.57	\$ 549,360.24
2006	Apr-06	43	\$ 37,090.92	\$ 16,857.87	\$ 23,374.82	\$ 5,321.06	\$ 466,715.57	\$ 549,360.24
2006	May-06	44	\$ 37,090.92	\$ 16,857.87	\$ 23,374.82	\$ 5,321.06	\$ 466,715.57	\$ 549,360.24
2006	Jun-06	45	\$ 37,090.92	\$ 16,857.87	\$ 23,374.82	\$ 5,321.06	\$ 466,715.57	\$ 549,360.24
2006	Jul-06	46	\$ 37,090.92	\$ 16,857.87	\$ 23,374.82	\$ 5,321.06	\$ 466,715.57	\$ 549,360.24
2006	Aug-06	47	\$ 37,090.92	\$ 16,857.87	\$ 23,374.82	\$ 5,321.06	\$ 466,715.57	\$ 549,360.24
2006	Sep-06	48	\$ 37,090.92	\$ 16,857.87	\$ 23,374.82	\$ 5,321.06	\$ 466,715.57	\$ 549,360.24
2006	Oct-06	49	\$ 37,090.92	\$ 16,857.87	\$ 23,374.82	\$ 5,321.06	\$ 466,715.57	\$ 549,360.24
2006	Nov-06	50	\$ 37,090.92	\$ 16,857.87	\$ 23,374.82	\$ 5,321.06	\$ 466,715.57	\$ 549,360.24
2006	Dec-06	51	\$ 37,090.92	\$ 16,857.87	\$ 23,374.82	\$ 5,321.06	\$ 466,715.57	\$ 549,360.24

2007	Jan-07	52	\$ 37,813.66	\$ 17,186.36	\$ 23,830.30	\$ 5,424.75	\$ 475,809.89	\$ 560,064.97
2007	Feb-07	53	\$ 37,813.66	\$ 17,186.36	\$ 23,830.30	\$ 5,424.75	\$ 475,809.89	\$ 560,064.97
2007	Mar-07	54	\$ 37,813.66	\$ 17,186.36	\$ 23,830.30	\$ 5,424.75	\$ 475,809.89	\$ 560,064.97
2007	Apr-07	55	\$ 37,813.66	\$ 17,186.36	\$ 23,830.30	\$ 5,424.75	\$ 475,809.89	\$ 560,064.97
2007	May-07	56	\$ 37,813.66	\$ 17,186.36	\$ 23,830.30	\$ 5,424.75	\$ 475,809.89	\$ 560,064.97
2007	Jun-07	57	\$ 37,813.66	\$ 17,186.36	\$ 23,830.30	\$ 5,424.75	\$ 475,809.89	\$ 560,064.97
2007	Jul-07	58	\$ 37,813.66	\$ 17,186.36	\$ 23,830.30	\$ 5,424.75	\$ 475,809.89	\$ 560,064.97
2007	Aug-07	59	\$ 37,813.66	\$ 17,186.36	\$ 23,830.30	\$ 5,424.75	\$ 475,809.89	\$ 560,064.97
2007	Sep-07	60	\$ 37,813.66	\$ 17,186.36	\$ 23,830.30	\$ 5,424.75	\$ 475,809.89	\$ 560,064.97
2007	Oct-07	61	\$ 37,813.66	\$ 17,186.36	\$ 23,830.30	\$ 5,424.75	\$ 475,809.89	\$ 560,064.97
2007	Nov-07	62	\$ 37,813.66	\$ 17,186.36	\$ 23,830.30	\$ 5,424.75	\$ 475,809.89	\$ 560,064.97
2007	Dec-07	63	\$ 37,813.66	\$ 17,186.36	\$ 23,830.30	\$ 5,424.75	\$ 475,809.89	\$ 560,064.97
2008	Jan-08	64	\$ 38,548.51	\$ 17,520.35	\$ 24,293.40	\$ 5,530.17	\$ 485,056.55	\$ 570,948.99
2008	Feb-08	65	\$ 38,548.51	\$ 17,520.35	\$ 24,293.40	\$ 5,530.17	\$ 485,056.55	\$ 570,948.99
2008	Mar-08	66	\$ 38,548.51	\$ 17,520.35	\$ 24,293.40	\$ 5,530.17	\$ 485,056.55	\$ 570,948.99
2008	Apr-08	67	\$ 38,548.51	\$ 17,520.35	\$ 24,293.40	\$ 5,530.17	\$ 485,056.55	\$ 570,948.99
2008	May-08	68	\$ 38,548.51	\$ 17,520.35	\$ 24,293.40	\$ 5,530.17	\$ 485,056.55	\$ 570,948.99
2008	Jun-08	69	\$ 38,548.51	\$ 17,520.35	\$ 24,293.40	\$ 5,530.17	\$ 485,056.55	\$ 570,948.99
2008	Jul-08	70	\$ 38,548.51	\$ 17,520.35	\$ 24,293.40	\$ 5,530.17	\$ 485,056.55	\$ 570,948.99
2008	Aug-08	71	\$ 38,548.51	\$ 17,520.35	\$ 24,293.40	\$ 5,530.17	\$ 485,056.55	\$ 570,948.99
2008	Sep-08	72	\$ 38,548.51	\$ 17,520.35	\$ 24,293.40	\$ 5,530.17	\$ 485,056.55	\$ 570,948.99
2008	Oct-08	73	\$ 38,548.51	\$ 17,520.35	\$ 24,293.40	\$ 5,530.17	\$ 485,056.55	\$ 570,948.99
2008	Nov-08	74	\$ 38,548.51	\$ 17,520.35	\$ 24,293.40	\$ 5,530.17	\$ 485,056.55	\$ 570,948.99
2008	Dec-08	75	\$ 38,548.51	\$ 17,520.35	\$ 24,293.40	\$ 5,530.17	\$ 485,056.55	\$ 570,948.99
2009	Jan-09	76	\$ 39,295.59	\$ 17,859.90	\$ 24,764.21	\$ 5,637.34	\$ 494,457.02	\$ 582,014.07
2009	Feb-09	77	\$ 39,295.59	\$ 17,859.90	\$ 24,764.21	\$ 5,637.34	\$ 494,457.02	\$ 582,014.07
2009	Mar-09	78	\$ 39,295.59	\$ 17,859.90	\$ 24,764.21	\$ 5,637.34	\$ 494,457.02	\$ 582,014.07
2009	Apr-09	79	\$ 39,295.59	\$ 17,859.90	\$ 24,764.21	\$ 5,637.34	\$ 494,457.02	\$ 582,014.07
2009	May-09	80	\$ 39,295.59	\$ 17,859.90	\$ 24,764.21	\$ 5,637.34	\$ 494,457.02	\$ 582,014.07
2009	Jun-09	81	\$ 39,295.59	\$ 17,859.90	\$ 24,764.21	\$ 5,637.34	\$ 494,457.02	\$ 582,014.07
2009	Jul-09	82	\$ 39,295.59	\$ 17,859.90	\$ 24,764.21	\$ 5,637.34	\$ 494,457.02	\$ 582,014.07
2009	Aug-09	83	\$ 39,295.59	\$ 17,859.90	\$ 24,764.21	\$ 5,637.34	\$ 494,457.02	\$ 582,014.07
2009	Sep-09	84	\$ 39,295.59	\$ 17,859.90	\$ 24,764.21	\$ 5,637.34	\$ 494,457.02	\$ 582,014.07
2009	Oct-09	85	\$ 39,295.59	\$ 17,859.90	\$ 24,764.21	\$ 5,637.34	\$ 494,457.02	\$ 582,014.07
2009	Nov-09	86	\$ 39,295.59	\$ 17,859.90	\$ 24,764.21	\$ 5,637.34	\$ 494,457.02	\$ 582,014.07
2009	Dec-09	87	\$ 39,295.59	\$ 17,859.90	\$ 24,764.21	\$ 5,637.34	\$ 494,457.02	\$ 582,014.07
2010	Jan-10	88	\$ 40,055.01	\$ 18,205.06	\$ 25,242.80	\$ 5,746.29	\$ 504,012.79	\$ 593,261.95
2010	Feb-10	89	\$ 40,055.01	\$ 18,205.06	\$ 25,242.80	\$ 5,746.29	\$ 504,012.79	\$ 593,261.95
2010	Mar-10	90	\$ 40,055.01	\$ 18,205.06	\$ 25,242.80	\$ 5,746.29	\$ 504,012.79	\$ 593,261.95
2010	Apr-10	91	\$ 40,055.01	\$ 18,205.06	\$ 25,242.80	\$ 5,746.29	\$ 504,012.79	\$ 593,261.95
2010	May-10	92	\$ 40,055.01	\$ 18,205.06	\$ 25,242.80	\$ 5,746.29	\$ 504,012.79	\$ 593,261.95
2010	Jun-10	93	\$ 40,055.01	\$ 18,205.06	\$ 25,242.80	\$ 5,746.29	\$ 504,012.79	\$ 593,261.95
2010	Jul-10	94	\$ 40,055.01	\$ 18,205.06	\$ 25,242.80	\$ 5,746.29	\$ 504,012.79	\$ 593,261.95
2010	Aug-10	95	\$ 40,055.01	\$ 18,205.06	\$ 25,242.80	\$ 5,746.29	\$ 504,012.79	\$ 593,261.95
2010	Sep-10	96	\$ 40,055.01	\$ 18,205.06	\$ 25,242.80	\$ 5,746.29	\$ 504,012.79	\$ 593,261.95
2010	Oct-10	97	\$ 40,055.01	\$ 18,205.06	\$ 25,242.80	\$ 5,746.29	\$ 504,012.79	\$ 593,261.95
2010	Nov-10	98	\$ 40,055.01	\$ 18,205.06	\$ 25,242.80	\$ 5,746.29	\$ 504,012.79	\$ 593,261.95
2010	Dec-10	99	\$ 40,055.01	\$ 18,205.06	\$ 25,242.80	\$ 5,746.29	\$ 504,012.79	\$ 593,261.95

2011	Jan-11	100	\$ 40,826.88	\$ 18,555.88	\$ 25,729.24	\$ 5,857.02	\$ 513,725.27	\$ 604,694.29
2011	Feb-11	101	\$ 40,826.88	\$ 18,555.88	\$ 25,729.24	\$ 5,857.02	\$ 513,725.27	\$ 604,694.29
2011	Mar-11	102	\$ 40,826.88	\$ 18,555.88	\$ 25,729.24	\$ 5,857.02	\$ 513,725.27	\$ 604,694.29
2011	Apr-11	103	\$ 40,826.88	\$ 18,555.88	\$ 25,729.24	\$ 5,857.02	\$ 513,725.27	\$ 604,694.29
2011	May-11	104	\$ 40,826.88	\$ 18,555.88	\$ 25,729.24	\$ 5,857.02	\$ 513,725.27	\$ 604,694.29
2011	Jun-11	105	\$ 40,826.88	\$ 18,555.88	\$ 25,729.24	\$ 5,857.02	\$ 513,725.27	\$ 604,694.29
2011	Jul-11	106	\$ 40,826.88	\$ 18,555.88	\$ 25,729.24	\$ 5,857.02	\$ 513,725.27	\$ 604,694.29
2011	Aug-11	107	\$ 40,826.88	\$ 18,555.88	\$ 25,729.24	\$ 5,857.02	\$ 513,725.27	\$ 604,694.29
2011	Sep-11	108	\$ 40,826.88	\$ 18,555.88	\$ 25,729.24	\$ 5,857.02	\$ 513,725.27	\$ 604,694.29
2011	Oct-11	109	\$ 40,826.88	\$ 18,555.88	\$ 25,729.24	\$ 5,857.02	\$ 513,725.27	\$ 604,694.29
2011	Nov-11	110	\$ 40,826.88	\$ 18,555.88	\$ 25,729.24	\$ 5,857.02	\$ 513,725.27	\$ 604,694.29
2011	Dec-11	111	\$ 40,826.88	\$ 18,555.88	\$ 25,729.24	\$ 5,857.02	\$ 513,725.27	\$ 604,694.29
2012	Jan-12	112	\$ 41,611.32	\$ 18,912.40	\$ 26,223.59	\$ 5,969.56	\$ 523,595.85	\$ 616,312.72
2012	Feb-12	113	\$ 41,611.32	\$ 18,912.40	\$ 26,223.59	\$ 5,969.56	\$ 523,595.85	\$ 616,312.72
2012	Mar-12	114	\$ 41,611.32	\$ 18,912.40	\$ 26,223.59	\$ 5,969.56	\$ 523,595.85	\$ 616,312.72
2012	Apr-12	115	\$ 41,611.32	\$ 18,912.40	\$ 26,223.59	\$ 5,969.56	\$ 523,595.85	\$ 616,312.72
2012	May-12	116	\$ 41,611.32	\$ 18,912.40	\$ 26,223.59	\$ 5,969.56	\$ 523,595.85	\$ 616,312.72
2012	Jun-12	117	\$ 41,611.32	\$ 18,912.40	\$ 26,223.59	\$ 5,969.56	\$ 523,595.85	\$ 616,312.72
2012	Jul-12	118	\$ 41,611.32	\$ 18,912.40	\$ 26,223.59	\$ 5,969.56	\$ 523,595.85	\$ 616,312.72
2012	Aug-12	119	\$ 41,611.32	\$ 18,912.40	\$ 26,223.59	\$ 5,969.56	\$ 523,595.85	\$ 616,312.72
2012	Sep-12	120	\$ 41,611.32	\$ 18,912.40	\$ 26,223.59	\$ 5,969.56	\$ 523,595.85	\$ 616,312.72
2012	Oct-12	121	\$ 41,611.32	\$ 18,912.40	\$ 26,223.59	\$ 5,969.56	\$ 523,595.85	\$ 616,312.72
2012	Nov-12	122	\$ 41,611.32	\$ 18,912.40	\$ 26,223.59	\$ 5,969.56	\$ 523,595.85	\$ 616,312.72
2012	Dec-12	123	\$ 41,611.32	\$ 18,912.40	\$ 26,223.59	\$ 5,969.56	\$ 523,595.85	\$ 616,312.72
2013	Jan-13	124	\$ 42,408.42	\$ 19,274.69	\$ 26,725.93	\$ 6,083.91	\$ 533,625.86	\$ 628,118.82
2013	Feb-13	125	\$ 42,408.42	\$ 19,274.69	\$ 26,725.93	\$ 6,083.91	\$ 533,625.86	\$ 628,118.82
2013	Mar-13	126	\$ 42,408.42	\$ 19,274.69	\$ 26,725.93	\$ 6,083.91	\$ 533,625.86	\$ 628,118.82
2013	Apr-13	127	\$ 42,408.42	\$ 19,274.69	\$ 26,725.93	\$ 6,083.91	\$ 533,625.86	\$ 628,118.82
2013	May-13	128	\$ 42,408.42	\$ 19,274.69	\$ 26,725.93	\$ 6,083.91	\$ 533,625.86	\$ 628,118.82
2013	Jun-13	129	\$ 42,408.42	\$ 19,274.69	\$ 26,725.93	\$ 6,083.91	\$ 533,625.86	\$ 628,118.82
2013	Jul-13	130	\$ 42,408.42	\$ 19,274.69	\$ 26,725.93	\$ 6,083.91	\$ 533,625.86	\$ 628,118.82
2013	Aug-13	131	\$ 42,408.42	\$ 19,274.69	\$ 26,725.93	\$ 6,083.91	\$ 533,625.86	\$ 628,118.82
2013	Sep-13	132	\$ 42,408.42	\$ 19,274.69	\$ 26,725.93	\$ 6,083.91	\$ 533,625.86	\$ 628,118.82
2013	Oct-13	133	\$ 42,408.42	\$ 19,274.69	\$ 26,725.93	\$ 6,083.91	\$ 533,625.86	\$ 628,118.82
2013	Nov-13	134	\$ 42,408.42	\$ 19,274.69	\$ 26,725.93	\$ 6,083.91	\$ 533,625.86	\$ 628,118.82
2013	Dec-13	135	\$ 42,408.42	\$ 19,274.69	\$ 26,725.93	\$ 6,083.91	\$ 533,625.86	\$ 628,118.82
2014	Jan-14	136	\$ 43,218.30	\$ 19,642.78	\$ 27,236.32	\$ 6,200.10	\$ 543,816.58	\$ 640,114.08
2014	Feb-14	137	\$ 43,218.30	\$ 19,642.78	\$ 27,236.32	\$ 6,200.10	\$ 543,816.58	\$ 640,114.08
2014	Mar-14	138	\$ 43,218.30	\$ 19,642.78	\$ 27,236.32	\$ 6,200.10	\$ 543,816.58	\$ 640,114.08
2014	Apr-14	139	\$ 43,218.30	\$ 19,642.78	\$ 27,236.32	\$ 6,200.10	\$ 543,816.58	\$ 640,114.08
2014	May-14	140	\$ 43,218.30	\$ 19,642.78	\$ 27,236.32	\$ 6,200.10	\$ 543,816.58	\$ 640,114.08
2014	Jun-14	141	\$ 43,218.30	\$ 19,642.78	\$ 27,236.32	\$ 6,200.10	\$ 543,816.58	\$ 640,114.08
2014	Jul-14	142	\$ 43,218.30	\$ 19,642.78	\$ 27,236.32	\$ 6,200.10	\$ 543,816.58	\$ 640,114.08
2014	Aug-14	143	\$ 43,218.30	\$ 19,642.78	\$ 27,236.32	\$ 6,200.10	\$ 543,816.58	\$ 640,114.08
2014	Sep-14	144	\$ 43,218.30	\$ 19,642.78	\$ 27,236.32	\$ 6,200.10	\$ 543,816.58	\$ 640,114.08
2014	Oct-14	145	\$ 43,218.30	\$ 19,642.78	\$ 27,236.32	\$ 6,200.10	\$ 543,816.58	\$ 640,114.08
2014	Nov-14	146	\$ 43,218.30	\$ 19,642.78	\$ 27,236.32	\$ 6,200.10	\$ 543,816.58	\$ 640,114.08
2014	Dec-14	147	\$ 43,218.30	\$ 19,642.78	\$ 27,236.32	\$ 6,200.10	\$ 543,816.58	\$ 640,114.08

2015	Jan-15	148	\$ 44,041.05	\$ 20,016.72	\$ 27,754.82	\$ 6,318.13	\$ 554,169.24	\$ 652,299.96
2015	Feb-15	149	\$ 44,041.05	\$ 20,016.72	\$ 27,754.82	\$ 6,318.13	\$ 554,169.24	\$ 652,299.96
2015	Mar-15	150	\$ 44,041.05	\$ 20,016.72	\$ 27,754.82	\$ 6,318.13	\$ 554,169.24	\$ 652,299.96
2015	Apr-15	151	\$ 44,041.05	\$ 20,016.72	\$ 27,754.82	\$ 6,318.13	\$ 554,169.24	\$ 652,299.96
2015	May-15	152	\$ 44,041.05	\$ 20,016.72	\$ 27,754.82	\$ 6,318.13	\$ 554,169.24	\$ 652,299.96
2015	Jun-15	153	\$ 44,041.05	\$ 20,016.72	\$ 27,754.82	\$ 6,318.13	\$ 554,169.24	\$ 652,299.96
2015	Jul-15	154	\$ 44,041.05	\$ 20,016.72	\$ 27,754.82	\$ 6,318.13	\$ 554,169.24	\$ 652,299.96
2015	Aug-15	155	\$ 44,041.05	\$ 20,016.72	\$ 27,754.82	\$ 6,318.13	\$ 554,169.24	\$ 652,299.96
2015	Sep-15	156	\$ 44,041.05	\$ 20,016.72	\$ 27,754.82	\$ 6,318.13	\$ 554,169.24	\$ 652,299.96
2015	Oct-15	157	\$ 44,041.05	\$ 20,016.72	\$ 27,754.82	\$ 6,318.13	\$ 554,169.24	\$ 652,299.96
2015	Nov-15	158	\$ 44,041.05	\$ 20,016.72	\$ 27,754.82	\$ 6,318.13	\$ 554,169.24	\$ 652,299.96
2015	Dec-15	159	\$ 44,041.05	\$ 20,016.72	\$ 27,754.82	\$ 6,318.13	\$ 554,169.24	\$ 652,299.96
2016	Jan-16	160	\$ 44,876.76	\$ 20,396.55	\$ 28,281.49	\$ 6,438.02	\$ 564,685.00	\$ 664,677.82
2016	Feb-16	161	\$ 44,876.76	\$ 20,396.55	\$ 28,281.49	\$ 6,438.02	\$ 564,685.00	\$ 664,677.82
2016	Mar-16	162	\$ 44,876.76	\$ 20,396.55	\$ 28,281.49	\$ 6,438.02	\$ 564,685.00	\$ 664,677.82
2016	Apr-16	163	\$ 44,876.76	\$ 20,396.55	\$ 28,281.49	\$ 6,438.02	\$ 564,685.00	\$ 664,677.82
2016	May-16	164	\$ 44,876.76	\$ 20,396.55	\$ 28,281.49	\$ 6,438.02	\$ 564,685.00	\$ 664,677.82
2016	Jun-16	165	\$ 44,876.76	\$ 20,396.55	\$ 28,281.49	\$ 6,438.02	\$ 564,685.00	\$ 664,677.82
2016	Jul-16	166	\$ 44,876.76	\$ 20,396.55	\$ 28,281.49	\$ 6,438.02	\$ 564,685.00	\$ 664,677.82
2016	Aug-16	167	\$ 44,876.76	\$ 20,396.55	\$ 28,281.49	\$ 6,438.02	\$ 564,685.00	\$ 664,677.82
2016	Sep-16	168	\$ 44,876.76	\$ 20,396.55	\$ 28,281.49	\$ 6,438.02	\$ 564,685.00	\$ 664,677.82
2016	Oct-16	169	\$ 44,876.76	\$ 20,396.55	\$ 28,281.49	\$ 6,438.02	\$ 564,685.00	\$ 664,677.82
2016	Nov-16	170	\$ 44,876.76	\$ 20,396.55	\$ 28,281.49	\$ 6,438.02	\$ 564,685.00	\$ 664,677.82
2016	Dec-16	171	\$ 44,876.76	\$ 20,396.55	\$ 28,281.49	\$ 6,438.02	\$ 564,685.00	\$ 664,677.82
2017	Jan-17	172	\$ 45,725.52	\$ 20,782.32	\$ 28,816.38	\$ 6,559.78	\$ 575,364.97	\$ 677,248.97
2017	Feb-17	173	\$ 45,725.52	\$ 20,782.32	\$ 28,816.38	\$ 6,559.78	\$ 575,364.97	\$ 677,248.97
2017	Mar-17	174	\$ 45,725.52	\$ 20,782.32	\$ 28,816.38	\$ 6,559.78	\$ 575,364.97	\$ 677,248.97
2017	Apr-17	175	\$ 45,725.52	\$ 20,782.32	\$ 28,816.38	\$ 6,559.78	\$ 575,364.97	\$ 677,248.97
2017	May-17	176	\$ 45,725.52	\$ 20,782.32	\$ 28,816.38	\$ 6,559.78	\$ 575,364.97	\$ 677,248.97
2017	Jun-17	177	\$ 45,725.52	\$ 20,782.32	\$ 28,816.38	\$ 6,559.78	\$ 575,364.97	\$ 677,248.97
2017	Jul-17	178	\$ 45,725.52	\$ 20,782.32	\$ 28,816.38	\$ 6,559.78	\$ 575,364.97	\$ 677,248.97
2017	Aug-17	179	\$ 45,725.52	\$ 20,782.32	\$ 28,816.38	\$ 6,559.78	\$ 575,364.97	\$ 677,248.97
2017	Sep-17	180	\$ 45,725.52	\$ 20,782.32	\$ 28,816.38	\$ 6,559.78	\$ 575,364.97	\$ 677,248.97
2017	Oct-17	181	\$ 45,725.52	\$ 20,782.32	\$ 28,816.38	\$ 6,559.78	\$ 575,364.97	\$ 677,248.97
2017	Nov-17	182	\$ 45,725.52	\$ 20,782.32	\$ 28,816.38	\$ 6,559.78	\$ 575,364.97	\$ 677,248.97
2017	Dec-17	183	\$ 45,725.52	\$ 20,782.32	\$ 28,816.38	\$ 6,559.78	\$ 575,364.97	\$ 677,248.97
2018	Jan-18	184	\$ 46,587.42	\$ 21,174.05	\$ 29,359.55	\$ 6,683.43	\$ 586,210.18	\$ 690,014.62
2018	Feb-18	185	\$ 46,587.42	\$ 21,174.05	\$ 29,359.55	\$ 6,683.43	\$ 586,210.18	\$ 690,014.62
2018	Mar-18	186	\$ 46,587.42	\$ 21,174.05	\$ 29,359.55	\$ 6,683.43	\$ 586,210.18	\$ 690,014.62
2018	Apr-18	187	\$ 46,587.42	\$ 21,174.05	\$ 29,359.55	\$ 6,683.43	\$ 586,210.18	\$ 690,014.62
2018	May-18	188	\$ 46,587.42	\$ 21,174.05	\$ 29,359.55	\$ 6,683.43	\$ 586,210.18	\$ 690,014.62
2018	Jun-18	189	\$ 46,587.42	\$ 21,174.05	\$ 29,359.55	\$ 6,683.43	\$ 586,210.18	\$ 690,014.62
2018	Jul-18	190	\$ 46,587.42	\$ 21,174.05	\$ 29,359.55	\$ 6,683.43	\$ 586,210.18	\$ 690,014.62
2018	Aug-18	191	\$ 46,587.42	\$ 21,174.05	\$ 29,359.55	\$ 6,683.43	\$ 586,210.18	\$ 690,014.62
2018	Sep-18	192	\$ 46,587.42	\$ 21,174.05	\$ 29,359.55	\$ 6,683.43	\$ 586,210.18	\$ 690,014.62
2018	Oct-18	193	\$ 46,587.42	\$ 21,174.05	\$ 29,359.55	\$ 6,683.43	\$ 586,210.18	\$ 690,014.62
2018	Nov-18	194	\$ 46,587.42	\$ 21,174.05	\$ 29,359.55	\$ 6,683.43	\$ 586,210.18	\$ 690,014.62
2018	Dec-18	195	\$ 46,587.42	\$ 21,174.05	\$ 29,359.55	\$ 6,683.43	\$ 586,210.18	\$ 690,014.62

2019	Jan-19	196	\$ 47,462.52	\$ 21,571.78	\$ 29,911.04	\$ 6,808.97	\$ 597,221.59	\$ 702,975.91
2019	Feb-19	197	\$ 47,462.52	\$ 21,571.78	\$ 29,911.04	\$ 6,808.97	\$ 597,221.59	\$ 702,975.91
2019	Mar-19	198	\$ 47,462.52	\$ 21,571.78	\$ 29,911.04	\$ 6,808.97	\$ 597,221.59	\$ 702,975.91
2019	Apr-19	199	\$ 47,462.52	\$ 21,571.78	\$ 29,911.04	\$ 6,808.97	\$ 597,221.59	\$ 702,975.91
2019	May-19	200	\$ 47,462.52	\$ 21,571.78	\$ 29,911.04	\$ 6,808.97	\$ 597,221.59	\$ 702,975.91
2019	Jun-19	201	\$ 47,462.52	\$ 21,571.78	\$ 29,911.04	\$ 6,808.97	\$ 597,221.59	\$ 702,975.91
2019	Jul-19	202	\$ 47,462.52	\$ 21,571.78	\$ 29,911.04	\$ 6,808.97	\$ 597,221.59	\$ 702,975.91
2019	Aug-19	203	\$ 47,462.52	\$ 21,571.78	\$ 29,911.04	\$ 6,808.97	\$ 597,221.59	\$ 702,975.91
2019	Sep-19	204	\$ 47,462.52	\$ 21,571.78	\$ 29,911.04	\$ 6,808.97	\$ 597,221.59	\$ 702,975.91
2019	Oct-19	205	\$ 47,462.52	\$ 21,571.78	\$ 29,911.04	\$ 6,808.97	\$ 597,221.59	\$ 702,975.91
2019	Nov-19	206	\$ 47,462.52	\$ 21,571.78	\$ 29,911.04	\$ 6,808.97	\$ 597,221.59	\$ 702,975.91
2019	Dec-19	207	\$ 47,462.52	\$ 21,571.78	\$ 29,911.04	\$ 6,808.97	\$ 597,221.59	\$ 702,975.91
2020	Jan-20	208	\$ 48,350.90	\$ 21,975.55	\$ 30,470.90	\$ 6,936.42	\$ 608,400.09	\$ 716,133.85
2020	Feb-20	209	\$ 48,350.90	\$ 21,975.55	\$ 30,470.90	\$ 6,936.42	\$ 608,400.09	\$ 716,133.85
2020	Mar-20	210	\$ 48,350.90	\$ 21,975.55	\$ 30,470.90	\$ 6,936.42	\$ 608,400.09	\$ 716,133.85
2020	Apr-20	211	\$ 48,350.90	\$ 21,975.55	\$ 30,470.90	\$ 6,936.42	\$ 608,400.09	\$ 716,133.85
2020	May-20	212	\$ 48,350.90	\$ 21,975.55	\$ 30,470.90	\$ 6,936.42	\$ 608,400.09	\$ 716,133.85
2020	Jun-20	213	\$ 48,350.90	\$ 21,975.55	\$ 30,470.90	\$ 6,936.42	\$ 608,400.09	\$ 716,133.85
2020	Jul-20	214	\$ 48,350.90	\$ 21,975.55	\$ 30,470.90	\$ 6,936.42	\$ 608,400.09	\$ 716,133.85
2020	Aug-20	215	\$ 48,350.90	\$ 21,975.55	\$ 30,470.90	\$ 6,936.42	\$ 608,400.09	\$ 716,133.85
2020	Sep-20	216	\$ 48,350.90	\$ 21,975.55	\$ 30,470.90	\$ 6,936.42	\$ 608,400.09	\$ 716,133.85
2020	Oct-20	217	\$ 48,350.90	\$ 21,975.55	\$ 30,470.90	\$ 6,936.42	\$ 608,400.09	\$ 716,133.85
2020	Nov-20	218	\$ 48,350.90	\$ 21,975.55	\$ 30,470.90	\$ 6,936.42	\$ 608,400.09	\$ 716,133.85
2020	Dec-20	219	\$ 48,350.90	\$ 21,975.55	\$ 30,470.90	\$ 6,936.42	\$ 608,400.09	\$ 716,133.85
2021	Jan-21	220	\$ 49,252.62	\$ 22,385.38	\$ 31,039.17	\$ 7,065.78	\$ 619,746.45	\$ 729,489.40
2021	Feb-21	221	\$ 49,252.62	\$ 22,385.38	\$ 31,039.17	\$ 7,065.78	\$ 619,746.45	\$ 729,489.40
2021	Mar-21	222	\$ 49,252.62	\$ 22,385.38	\$ 31,039.17	\$ 7,065.78	\$ 619,746.45	\$ 729,489.40
2021	Apr-21	223	\$ 49,252.62	\$ 22,385.38	\$ 31,039.17	\$ 7,065.78	\$ 619,746.45	\$ 729,489.40
2021	May-21	224	\$ 49,252.62	\$ 22,385.38	\$ 31,039.17	\$ 7,065.78	\$ 619,746.45	\$ 729,489.40
2021	Jun-21	225	\$ 49,252.62	\$ 22,385.38	\$ 31,039.17	\$ 7,065.78	\$ 619,746.45	\$ 729,489.40
2021	Jul-21	226	\$ 49,252.62	\$ 22,385.38	\$ 31,039.17	\$ 7,065.78	\$ 619,746.45	\$ 729,489.40
2021	Aug-21	227	\$ 49,252.62	\$ 22,385.38	\$ 31,039.17	\$ 7,065.78	\$ 619,746.45	\$ 729,489.40
2021	Sep-21	228	\$ 49,252.62	\$ 22,385.38	\$ 31,039.17	\$ 7,065.78	\$ 619,746.45	\$ 729,489.40
2021	Oct-21	229	\$ 49,252.62	\$ 22,385.38	\$ 31,039.17	\$ 7,065.78	\$ 619,746.45	\$ 729,489.40
2021	Nov-21	230	\$ 49,252.62	\$ 22,385.38	\$ 31,039.17	\$ 7,065.78	\$ 619,746.45	\$ 729,489.40
2021	Dec-21	231	\$ 49,252.62	\$ 22,385.38	\$ 31,039.17	\$ 7,065.78	\$ 619,746.45	\$ 729,489.40
2022	Jan-22	232	\$ 50,167.74	\$ 22,801.31	\$ 31,615.88	\$ 7,197.06	\$ 631,261.40	\$ 743,043.38
2022	Feb-22	233	\$ 50,167.74	\$ 22,801.31	\$ 31,615.88	\$ 7,197.06	\$ 631,261.40	\$ 743,043.38
2022	Mar-22	234	\$ 50,167.74	\$ 22,801.31	\$ 31,615.88	\$ 7,197.06	\$ 631,261.40	\$ 743,043.38
2022	Apr-22	235	\$ 50,167.74	\$ 22,801.31	\$ 31,615.88	\$ 7,197.06	\$ 631,261.40	\$ 743,043.38
2022	May-22	236	\$ 50,167.74	\$ 22,801.31	\$ 31,615.88	\$ 7,197.06	\$ 631,261.40	\$ 743,043.38
2022	Jun-22	237	\$ 50,167.74	\$ 22,801.31	\$ 31,615.88	\$ 7,197.06	\$ 631,261.40	\$ 743,043.38
2022	Jul-22	238	\$ 50,167.74	\$ 22,801.31	\$ 31,615.88	\$ 7,197.06	\$ 631,261.40	\$ 743,043.38
2022	Aug-22	239	\$ 50,167.74	\$ 22,801.31	\$ 31,615.88	\$ 7,197.06	\$ 631,261.40	\$ 743,043.38
2022	Sep-22	240	\$ 50,167.74	\$ 22,801.31	\$ 31,615.88	\$ 7,197.06	\$ 631,261.40	\$ 743,043.38
2022	Oct-22	241	\$ 50,167.74	\$ 22,801.31	\$ 31,615.88	\$ 7,197.06	\$ 631,261.40	\$ 743,043.38
2022	Nov-22	242	\$ 50,167.74	\$ 22,801.31	\$ 31,615.88	\$ 7,197.06	\$ 631,261.40	\$ 743,043.38
2022	Dec-22	243	\$ 50,167.74	\$ 22,801.31	\$ 31,615.88	\$ 7,197.06	\$ 631,261.40	\$ 743,043.38

Note: All escalations assumed to occur on January of each year.