ARRA Infrastructure Improvements at the National Optical Astronomy Observatory

Annual Project Report

for

1 August 2012 – 31 July 2013

Prepared for:
National Science Foundation

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NOAO is operated by the Association of Universities for Research in Astronomy under cooperative agreement with the National Science Foundation
MAJOR GOALS OF THE PROJECT

The project goals are to carry out high priority infrastructure and facility upgrades under the American Reinvestment and Recovery Act of 2009 (ARRA) at four main NOAO sites: base facilities in La Serena and Tucson and mountaintop facilities at Cerro Tololo Inter-American Observatory (CTIO) and Kitt Peak National Observatory (KPNO).

ACTIVITIES AND FINDINGS

A one-year extension of SPO-16 AST-0947035 to 31 July 2013 was granted initially by the NSF to enable completion of the work on projects such as the Kitt Peak instrument handling facility, the repair and renovations to the CTIO mountain dormitories, and several projects involving the La Serena infrastructure. Following that extension, an additional two-month extension to 30 September 2013 was needed. This report covers the activity related to those projects during the one-year extension.

TUCSON INFRASTRUCTURE

Renovate computer room electrical, cooling and fire detection/suppression systems:  
This project is complete. In the first part of the reporting period, the various system renovations were completed and minor efforts were ongoing as necessary to fine-tune the operations. When the minor adjustments that were necessary were made, the project was completed.

Replace 15-year-old building energy management and control system:  
This project is complete. The installation and implementation of the various interfaces was completed in the first quarter of this reporting period. The system became operational and staff began adjusting and calibrating the various building systems as appropriate to respond to the four seasons and their demands on the heating and cooling systems. In the second quarter of this period, minor adjustments and calibrations were implemented to meet the heating and cooling demands of the system, and the vendor provided warranty support as necessary. All such efforts were completed by the end of the third reporting quarter.

KPNO MOUNTAIN INFRASTRUCTURE

KPNO water system renovation:  
This project is complete. The primary water treatment processing system was completed, and operation of the plant was ongoing with the advent of the rainy season during the first reporting quarter. By the end of the second reporting quarter, adjustments to the various treatment processes to ensure compliance with EPA testing requirements had been made. Water processing tests indicate compliance with the new EPA testing requirements.

Kitt Peak instrument handling facility:  
Following a competitive architectural/engineering firm bid process, Advantech Facility Design, Inc. was awarded the contract to prepare renovation drawings for the instrument handling facility. NOAO staff worked with the firm during the first reporting quarter on the development of the construction documents. The architectural and engineering firm completed the renovation drawings and the project was placed out for contractor bids at the
end of the calendar year. Bids were obtained and reviewed by staff during January. Following a review of the information, NSF approved the award of the contract.

Renovation efforts began at the end of the second reporting period with targeted demolition of various components. The contractor then began work on improvements needed to meet the requirements of the new facility. The interior pits and trenches were filled with concrete, and construction began on the planned interior instrument testing control room space. Other efforts involved construction of a new loading dock and preparations for installation of large roll-up doors through which to move instruments. Revisions to the electrical system are being made that involve running utility lines to the planned test stations. NOAO staff worked to identify the required facility testing equipment. Purchasing of the equipment should begin in the final reporting quarter of this award year. The contractor plans are to have the building work substantially completed around July 22. The replacement of the bridge crane should be completed by mid-August.

CTIO MOUNTAIN INFRASTRUCTURE

Pachón water system renovation:
This project is complete. The renovation of the approximately 4.5-km piping system from the well to Cerro Tololo was completed and put in use during the first quarter of this reporting period. The final phase of replacing 1.3 km of underground piping from the Cerro Pachón utility yard to the dining/hotel area was completed during the second reporting period. The final connections at both ends were made, backfilling over the line was done, and the entire project was considered completed in the third reporting period.

Dormitories repair & renovations:
This project is complete. Three dormitory buildings with a total of 39 rooms and a dining facility had been renovated by the end of the first reporting period. The contractor, Veracruz Ltda., completed the final punch list and the contract was closed in the second reporting period. The renovated rooms and common areas are in full use.

Blanco 4-m mirror coating chamber:
This project is substantially complete. A portion of the work needed to be deferred until the next mirror recoating cycle, which will not take place until after the deadline for expenditure of ARRA funds. Consequently, NOAO requested on 28 June 2013 that the NSF allow expenditure of those dedicated funds to cover scope on another of the defined CTIO ARRA projects.

LA SERENA INFRASTRUCTURE

Machine shop modification & refurbishment:
The feasibility and need for this project has been reconsidered due to a projected cost that exceeds the allocated budget and potential availability of commercial anodizing facilities. At the end of Q3, NOAO requested that the NSF allow the use of these allocated funds to cover cost overruns on two other ARRA projects: the Blanco 4-m computing room & console upgrade for DECam and the Coudé room upgrades. The cost overruns were due to construction inflation and the low Chilean Peso/US Dollar exchange rate. The NSF approved the request on 10 July 2013 in Amendment No. 003 to AST-0947035.
La Serena compound water system renovation:
Materials needed for the tank, pump, and chlorination system upgrades were purchased early in this reporting period. The deep-well pump was replaced. By the end of Q3, the chlorination system had been completed and work had been contracted for refurbishment of the filtration system. Materials have been purchased for replacement of the tanks.

La Serena meeting rooms renovation:
By the second reporting period of this award year, the project to convert an underused area of the CTIO La Serena library into a staff interaction space and a multipurpose meeting/dining area was 75% complete. Following that period, furnishings were provided and the kitchenette area was completed. Construction bids for installation of an outdoor patio were received. Final contracting and scheduling of this project is pending.

Repair and renewal of security fencing for La Serena compound gate:
This project is complete.

ARRA EXPENDITURES
The table below provides a summary of the award accounts, showing cumulative expenditures through 31 May 2013 and the total funds remaining.

<table>
<thead>
<tr>
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<th>Award Amount</th>
<th>Prior Expenses</th>
<th>Q4 Expenses Thru May</th>
<th>Total Expenses</th>
<th>Funds Available</th>
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