



Capital Outlay Request Report
015 - Chemistry Building HVAC and Ventilation Upgrades

Business Case Status

Pending Start

Request

Institution New Mexico State University ▼

Project Title Chemistry Building HVAC and Ventilation Upgrades

Building(s)

Building	Building Age	Building GSF
CHEMISTRY BUILDING	64.00	30,382
CHEMISTRY BUILDING	54.00	30,262
CHEMISTRY BUILDING	26.00	53,968

Project Location See Campus Map

Project Map

Project Map Link

FY Priority # 3

Master Plan Priority #

3

Total Project Cost \$5,000,000

State Funding Request

\$5,000,000

Committed Match Funding \$0

Match Funding Source

N/A

Construction Type Renovation

Previous Request Summary N/A

History of Facility

Discussions for the existing Chemistry Building (187) began in 1955 for its location on the Horseshoe, along with planning the construction of Gardiner Hall for physics and Jett Halls for engineering. The Chemistry facility opened in 1957, housing an auditorium, elementary, organic and physical chemistry and quantitative analysis labs. The original structure was two stories with concrete block and steel frame construction. By 1967 it had been determined that a Graduate wing needed to be added on to the north side of the Chemistry Building. In 1968 the Graduate Chemistry Building was added faculty offices and lab spaces with a basement level and three stories above ground. The Graduate Chemistry Building project was authorized in 1967 and was completed in 1968. In 1997 another addition was added, the Chemistry and Molecular Biology Building. This building was constructed to the west and is connected to the main building by an arcade. The 1997 Lab Wing addition project included 50,000 SF featured a new main entrance and gallery, a lecture hall, graduate and undergraduate labs and faculty and graduate offices, connecting to the existing building at the 2nd and 3rd levels.

Current Condition

NMSU is currently working with Architectural Research Consultants (ARC) to conducting Facilities Condition Assessments (FCA) off selected NMSU buildings. The entire Chemistry Building was part of the first group of buildings to be analyzed. From FCA Preliminary Findings of selected buildings dated April 23, 2021 the Chemistry Building has replacement consideration cost to repair versus the insured value of the building of 122% or \$27,289,068. One major deficiency to the performance of the building is the mechanical and ventilation systems throughout the facility and code compliance for the laboratories in all sections of the building. This is the worst percentage of a building thus far in the ARC evaluation and indicates that a significant amount of capital funding is needed for the building for repairs.

Renovation Information

There have been no impactful building system renovations since the 1995 addition and 15,000 SF of renovation to the original 1957 structure. Minor renovations include the 1998 third floor build-out for a Research Lab Suite; 2000 ADA Restrooms upgrades for one Men's and one Women's three stall modification to two to allow for ADA compliance; and laboratory improvements for Lab 104B in 2002, Lab 229 in 2011, Lab 225 in 2013, Labs 328 & 329 in 2013, and new fume hoods in Lab 109 in 2015. Emergency repairs have involve the elevator in the 1967 building to replace the elevator jack in 2015 and fire alarm modifications, same year. The recent updates have been the Lab 211 and Classroom 203 Renovations in 2019. Records show the funding from these projects are from Building Repair & Renewal (BRR).

Scope of Work

One year ago NMSU completed a HVAC Assessment and the Chemistry Building, all three portions, were evaluated. In an effort to responsibly prepare for the return to campus Fall 2020 semester, Facilities and Services embarked on a mission to perform a Phase-1 HVAC Condition Assessment of buildings identified for classroom activities. The objective of the study is to identify baseline HVAC operational parameters, equipment deficiencies and considerations toward implementation of filtration and germicidal mitigation technologies. The effort is primarily focused on creating a safer campus experience for Students, Faculty and Staff. This report provides the results of the field assessments for 34 buildings, 111 Central Air Handling Units, 152 Room Terminal Units and lists recommendations focused on air quality improvements that best suits each building function. The findings for Chemistry Building (1957, 1967 and 1995) revealed an overall theme of identified deficiencies for mechanical equipment that is in poor condition; inadequate heating and cooling systems; ventilation pathways not configured for minimum outside air; and issues with existing mechanical design for proper air volume. This project will update the mechanical system and ventilation for current codes and standards. A chemical fume hood is a specific type of air ventilation system equipped with powerful and energy-efficient fans and high-quality filtration media. Fume hood testing and corrective action for repairs or replacement will be part of this scope. The mechanical system, ventilation and fume hood upgrades will include the demolition of the existing exhaust, ductwork, fume hoods as identified by the HVAC assessment and engineering team. Penetrations at existing walls, ceiling and roof for the new exhaust fan duct and mechanical ductwork will be required. Installation of new HVAC units, fume hoods and exhaust fan units will also involve interior work to re-install ceiling grid, lights and HVAC diffusers.

Phases

Complete table if this project request contains multiple projects or if the project can be phased. List in priority order:

Phase #	Description	Part of Request	Amount	Start Date	End Date
1	Full Project	<input type="checkbox"/>	\$0.00	7/1/2023	8/30/2024

Students Impacted

Provide the instructional program majors being served by this project:

Major	HeadCount	FTE	% Growth Last Year	% Growth Average
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Enrollment

Provide Fall Semester enrollment data per year as reported on the NMHED website/eDEAR:

Year	FTE	OFTE
2013	16754	2142
2014	15821	2047
2015	15484	1985
2016	14826	1753
2017	14445	1627
2018	14297	1708
2019	14274	1792
2020	14216	4912

B. Project Rationale and Need:**Measure B1: Projects promotion of enrollment growth, retention, and degree production****B1 Score**

Substantially

B1 Explanation

A functional HVAC system not only maintains the temperature of the rooms in the Chemistry building. Laboratory infrastructure requires functional fume hoods, and these hoods require a functional HVAC system. Fume hoods ensure the health and safety of students, faculty, and staff since those conducting reactions using volatile solvents and/or producing toxic vapor are placed at immediate risk of toxic inhalation hazard. The hoods have failed on several occasions, requiring lengthy repairs resulting in lost research time and canceled undergraduate lab classes. It is only good fortune that these issues have not yet resulted in injury. Failure of the HVAC system results in the cancellation of lab experiments requiring fume hoods and places the completion of required courses in jeopardy. This situation affects retention and progress for degree completion for both undergraduate and graduate students. The proposed project for the NMSU Chemistry building is critical to the educational mission in the following ways: A. Many of the courses hosted in the Chemistry building have a required laboratory component. Six of the seven lower division courses offered, including all of the Chemistry General Education courses, have a lab component. Further, six additional upper division lab courses are offered in the building. Approximately 70% of the student credit hours produced by the Dept. of Chemistry and Biochemistry each semester has a required lab component. Further, over the past five years, more than 50% of the student credit hours generated by the Dept. of Chemistry and Biochemistry are General Education courses and 100% of Chemistry General Education courses are lab classes. Lab courses cannot be offered without a functional HVAC system. B. Thirty-one NMSU majors in five Colleges require at least one laboratory course hosted in the Chemistry building for degree completion: Nursing, Mechanical & Aerospace Engineering, Chemical Engineering, Industrial Engineering, Electrical and Computer Engineering, Engineering Technology, Civil Engineering, Biology, Biochemistry, Chemistry, Geological Sciences, Microbiology, Physics, Engineering Physics, Animal Science, Range Science, Entomology, Applied Microbiology, Environmental Sciences, Agronomy, Genetics, Soil Science, Food Science and Technology, Human Nutrition, Family and Consumer Science Education, Conservation Ecology, Fisheries and Wildlife Science, Horticulture, Counseling and Community Psychology, Communication Disorders, Athletic Training, and Kinesiology. Most of the courses required for these majors (except for Chemistry, Biochemistry, Biology, Microbiology, Genetic, Animal Science, and Chemical Engineering) are taken in the Freshman year. Therefore, without lab courses running in the Chemistry building, many students in many different majors would experience interruption in their required curriculum. C. Graduate students in Chemistry require the completion of a research thesis to attain both the M.S. and the Ph.D. degrees in Chemistry. Graduate students conduct their research in faculty research labs. Faculty research labs, like the teaching labs, require functional fume hoods and controlled temperature conditions.

Measure B2: Projects impact on education and workforce needs in local and regional economies**B2 Score**

Substantially

B2 Explanation

NMSU-Las Cruces is the State's land grant institution, 69% of the 14,221 students enrolled are from the State of New Mexico, and 58% of the enrolled students are Hispanic. Therefore, the educational mission impacts the availability of a diverse workforce. The higher educational training through coursework and experiential learning provided by the Dept. of Chemistry and Biochemistry is central to many of the key industries of the State of New Mexico. According to the NM Dept. of Economic Development, the industries of Biosciences, Sustainable & Green Energy, and Sustainable & Value-Added Agriculture are among the leading industries contributing to the State's workforce and economy. Each of these key industries require an educated workforce that includes advanced training in Chemistry and laboratory methods. Further, many NMSU graduates (especially in Chemistry and Engineering) contribute to the workforce of National Labs (e.g., Los Alamos, Carlsbad, Sandia) in New Mexico. In addition to the workforce areas that require advanced chemical training, degrees such as Nursing and the pre-medical areas of biomedically-related degrees also require chemistry lab courses as part of their curriculum. New Mexico is facing a shortage of medical professionals, especially nurses. During the current pandemic, the need for highly trained medical professionals is profound.

Measure B3: Projects support of HEI Strategic Plan or Facility Master Plan

Demonstrate project alignment with institutional mission and how project advances the institution's strategic or facility master plan.

B3 Score

Substantially

[Master Plan](#)[Master Plan Link](#)**B3 Explanation**

The mission of the New Mexico State University system is to serve the diverse needs of the state through comprehensive programs of education, research, extension and outreach, and public service. As the state's land-grant and space-grant university, and as a Hispanic-Serving Institution, NMSU fosters learning, inquiry, diversity and inclusion, social mobility, and service to the broader community. The NMSU Leads 2025 strategic plan includes four goals to reach its vision that by 2025 the NMSU system will excel in student success and social mobility for our diverse student populations, achieve the highest Carnegie research status (R1), and maintain our Carnegie Community Engagement classification. As described below, the Chemistry building and the success of students and faculty working in the building are key to advancing the goal of achieving R1 research status. The Chemistry Building HVAC and Ventilation Upgrades project will provide specific advances to Goal 1 and Goal 2 of the NMSU Leads 2025 strategic plan. Goal 1 is to enhance student success and social mobility. Objectives of this goal include realizing increases in student enrollment, retention and degree attainment (Objective 1.1). As defined in Measure B1 of this evaluation document, failure of the Chemistry building HVAC system would have a profound effect on the advancement of students through at least thirty-one different degree programs on the Las Cruces campus. Objective 1.4 seeks to strengthen student career pathways through experiential learning and research engagement. The Chemistry building hosts courses and faculty-led research labs that engage many students in research and trains them in experimental techniques. Therefore, this project directly affects the attainment of Goal 1. Goal 2 of the NMSU Leads 2025 strategic plan is to elevate research and creative activity and this goal is vital to the attainment of the highest Carnegie research status (R1). Research conducted in the Chemistry building is central to the research mission of NMSU as it houses 4 shared instrumentation rooms and 27 research labs occupied by 18 research groups managed by tenure-track faculty and employing research staff and graduate assistants. The tenure-track faculty in Chemistry and Biochemistry are expected to develop and maintain vigorous, externally-funded research programs. The research portfolio for the Department of Chemistry & Biochemistry averages \$5.2 Million in expenditures per year and is projected to increase by 10% in the next three years based on new research awards. This indicates that the Chemistry building houses and supports a significant portion of the research funding required to achieve Goal 2 of the strategic plan. The research labs of the Chemistry building are profoundly affected by the poor HVAC system. Each of these lab spaces require fume hoods and proper temperature and air ventilation for the health and safety of our students, faculty and staff as well as for the proper experimental conditions required for maintaining productive research programs. The hoods and ventilation system have failed on several occasions, requiring lengthy repairs resulting in lost research time. Goal 4 of the strategic plan is to build a robust University system seeking to improve the effectiveness, efficiencies, and the empowerment of operations that align with NMSU's strategic goals. As described in sections D below, the deteriorating condition of the Chemistry building is a drain on the NMSU's Facilities unit. Upgrading the HVAC system will reduce this burden so that facilities can more efficiently and effectively serve the needs of other units. The Chemistry Building is specifically listed in the campus master plan, with reference to the ventilation system for the laboratory space. The fume hood exhaust system in the Chemistry building has exceeded its capacity, and this is an opportunity to replace the exhaust system. Regardless, this facility will need to be addressed in the near term.

Measure B4: Facilities Assessment

Provide the facility's most recent condition score and summarize the major structural and systems conditions that resulted in that score. Provide selected supporting documentation in appendices and reference them in the body of the proposal.

B4 Level of Study Completed

Substantially

Cost to Repair

\$11,289,669

Replacement Cost Basis (\$ per SF)

\$195

Study**Study Link****Cost to Replace**

\$22,249,568

Cost to Repair AFTER Project

\$0

B4 Explanation

The mechanical system renovation of Chemistry Building project will be a fix for code compliance related to HVAC and ventilation only on this aging and deteriorating facilities, and reduce maintenance costs. See attached FCI information for the campus. Architectural Research Consultants Inc. (ARC) 2021 evaluation: Chemistry Building score 0.503 or Poor in the FCI condition. This is indicative that a significant amount of capital funding is needed for the building. Architectural Research Consultants Inc. (ARC) 2021 evaluation for the HVAC Upgrade: The buildings ventilation system is not adequate for the programs served, and does not function as required. The fume hood flow rates are erratic and fail often. Staff report temperatures in the building vary greatly between floors and sides of the building. The electrical upgrade will need to be done prior to the HVAC upgrade. Conduct a mechanical study of the heating and cooling system to determine the problem and possible solutions. Upgrade the building HVAC and vacuum system as recommended by the mechanical study. Ventilation system shall provide required flow rates at all fume hoods. The HVAC and Vacuum System Upgrade construction cost along is estimated at approximately \$5M. All of these recommended renovations only begin to bring the existing building up to current standards/codes and do not begin to touch the goals and need of the Chemistry Building. The FCI is an indicator of the overall condition of a building; calculated by dividing the maintenance, repair and replacement deficiencies of the facility by the current replacement value of the facility. NMSU is currently in the process of updating FCI system-wide for all of the campuses. We have hired a third party licensed architect and professional evaluation team to assess. Of the 22 completed buildings at the academic core, Chemistry Building has received a very Poor rating for full renovation or replacement. Full building evaluations for Chemistry, assessment of building condition and recommendations, were completed in March and April 2021.

Measure B5: Projects impact on On-campus and Off-campus Instruction

Provide information on how this project request will support both on-campus and off-campus instruction.

B5 Score

Substantially

B5 Explanation

On Campus-Instruction: As described in measure B1 above, a functional HVAC system is required to carry out instruction in the Chemistry and Biochemistry Building. Both lecture and laboratory courses are, therefore, enabled by this project. Lecture courses require the HVAC system for maintenance of classroom temperatures as well as the circulation of fresh air. Lab courses cannot be offered safely without functional HVAC due to lack of fume hoods. While ~30% of the 14,000+ students instructed in the Chemistry Building per year (see Enrollment Table) may be moved to a different building for lecture courses, 70% of those students could not be instructed because there are no other options on campus to offer chemical lab courses. Further, 100% of the Graduate students would have no functional research labs to gain the required advanced instruction to complete their M.S. and the Ph.D. degrees in Chemistry without the completion of this project. Off Campus Instruction: When Chemistry courses are offered via on-line instruction (as was the case in 2020 during the pandemic), the instructors and Teaching Assistants carry out live-streamed experiments in an interactive, synchronous environment with the enrolled students. These experimental demonstrations require the HVAC system. Therefore, without the completion of this project, even on-line instruction would not be possible. Further, Chemistry instruction at other institutions are effected by the project. The NMSU Chemistry and Biochemistry department offers its unique instrumentation for experiential learning instruction to any institution requiring advanced chemical education. For example, instructors and students travel from Western New Mexico University to gain access to Nuclear Magnetic Resonance and Mass Spectrometry.

C. Green Screen for Buildings**Measure C1: Energy Audit or similar energy assessment**

Document details of the audit to include who performed the audit, when it was completed, level of audit/assessment, improvements proposed, and benefits to this project

C1 Score

Substantially

Energy Audit Completed Yes No**Energy Audit****Energy Audit Link****C1 Explanation**

In 2013 Ameresco performed an investment grade audit of 46 of NMSU's buildings throughout the state, totaling nearly 2.7 million gross square feet. The audit included the facilities at Alamogordo, Carlsbad, Dona Ana Community College, Grants, remote Agricultural Science Centers, and all buildings on the main campus. NMSU also employs two Certified Energy Managers (CEM) who can look at the potential energy savings of projects. One of the many buildings included in this assessment was the Chemistry Building. NMSU performs regularly scheduled preventive maintenance on the building and fume hood ventilation system for the Chemistry Buildings. The minimum recommendation is to include the following items as part of the project: 1. Create a dedicated ventilation system for all fume hoods in the three buildings. 2. Create a dedicated comfort ventilation system for the three buildings 3. Commission both systems and upload copies of the commissioning report in AiM 4. Address root causes to "Too Hot/Too Cold" trouble calls that remain after commissioning Although this project will not be LEED certified, it will be designed using any possible sustainability or energy-conserving techniques that could apply. In general, any improvement to the campus building infrastructure will result in increased efficiency and a corresponding reduction in energy costs. Renovation work will be done following Green Screen standards, with goals of achieving additional energy cost savings. List of Green Screen strategies that will be incorporated in the project during construction include: • Construction waste management principles will be followed during the demolition. • Recycling of applicable materials. • Construction waste management principles followed during construction.

Measure C2: Projects impact on Energy / Utility Cost Reduction

Explain the impact of this project to the net energy / utility costs. Provide a justification if no operating budget impact is anticipated.

Current Energy Usage

\$0

Energy Usage AFTER Project

\$0

C2 Explanation

NMSU's building guidelines includes policies to encouraging energy reduction with nearly every project. Additionally, there have been specific projects focusing on energy reduction such as the Ameresco projects. With each project resulting in energy savings there will also be a utility cost savings which can result in an observable change. When the equipment is replaced with more efficiency there will be a reduction in costs. However, the equipment change can also change the system maintenance requirements as well and without knowing what the replacement system will be we are unable to make accurate predictions. A cost

analysis generated for the period of Fiscal Year 17 through May 10, 2021 found that NMSU spent \$270,043 to perform maintenance and repairs on the system. Preventive maintenance expenditures account for 52% of the total expense with the remaining 48% on Corrective maintenance. NMSU projects will achieve up to 75% reduction in annual corrective maintenance labor hours and total work order costs. This equates to an annual maximum reduction in 317 labor hours and \$24,301 total work order cost.

Measure C3: Executive Order (EO) 2019-003

Provide detailed information on how this project will address the goal of reducing Green House Gas (GHG) emissions by 45% as called for in the EO. Explain the steps taken to reduce the buildings energy demands.

C3 Score Substantially ▼

C3 Explanation Over 95% of NMSU’s scope 1 and 2 emissions are building emissions. Reaching the goals within EO 2019 -003 for greenhouse gas emission reduction remodeling and updating existing infrastructure will be required. Approximately 40% of commercial building’s energy use is from the HVAC systems. Therefore, projects focusing on upgrading existing HVAC systems can have a noticeable impact on the GHG emissions.

D. Stewardship - Detail how the HEI provides stewardship for its assets.

Measure D1: Project Estimates

Describe how this projects cost estimates were developed. Provide the total dollars attributed to inflation. Percentage increases MUST be defended in the narrative portion of the document, or 0% inflation will be assumed.

D1 Score Substantially ▼

Base Project Estimate	\$5,983,250	Dollars Related to Inflation	\$143,519
Formal Estimate Provided	<input checked="" type="radio"/> Yes <input type="radio"/> No	Formal Estimate	Estimate Link

D1 Explanation The process for determining the capital outlay needs begins with the University Architect (UA), who stays in touch with the needs of the education enterprise through communication on various levels. Each year, the University Architect and Associate Vice President for Facilities and Services set up an in-person meeting with the Deans of the Colleges to review the capital outlay requests for the year. The Capital Outlay Briefing is presented to the University Administrative Council, and the flowchart that outlines the process for a project concept to become a priority on NMSU’s Five Year Facilities Plan. Project champions (presidents, deans, and vice presidents) submit a Capital Project Proposal Form with justification, business plan, supporting data, and sketches/drawings. The Project Request Form (PRF) is generated; the project is reviewed for compliance with the campus master plan document; and forwarded to Project Development and Engineering (PDE) for a preliminary estimate. The estimate is then assigned directly to the in-house professional estimator, Senior Project Manager. The scope of work is determined with the relevant stakeholders and UA. Budgetary estimates are produced with the use of 2020 ProEst Estimating Software that is built using the current RS Means database. Note that the in-house professional estimator with Facilities and Services PDE must meet satisfactory evidence of the necessary qualifications as required by the Certifying Body of the American Society of Professional Estimators. The Executive Director for PDE reviews the proposed costs to confirm the estimate is reasonable and accurate. Then the AVP of Facilities reports to the Administration for further action and/or inclusion into Capital Outlay or University Capital Plans. Budgetary estimates older than a year are reviewed and adjusted for inflation as part of the capital outlay process, and incorporation to the current campus Five Year Facilities Plans.

Measure D2: Describe how this project addresses/reduces deferred maintenance on campus

Deferred Maintenance	\$146,266,717	Deferred Maintenance AFTER Project	\$0
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D2 Explanation Over the past 3 years ongoing HVAC and other infrastructure issues have resulted in submission of 170 Work Order requests to address problems in the Chemistry & Biochemistry buildings. This equates to more than one submission per week. The resulting service activities have been bandages on an aging system which do not solve the underlying problem but rather patch the system for a brief time. Investing in an upgraded HVAC should greatly lessen the burden placed upon NMSU Facilities. Per the NMSU FCA Preliminary Findings from Architectural Research Consultants (ARC), dated April 23, 2021, in the first 22 buildings evaluated, there is \$66,059,399 of Recommended HVAC Projects on the Las Cruces Campus alone.

Measure D3: Asset Stewardship Provide information on how the HEI supports the ongoing operational and maintenance needs of current and proposed assets.

D3 Score Substantially ▼

Level of Plan Substantially ▼ **BRR Plan** **BRR Link**

D3 Explanation Facilities and Services receives an annual funding allocation for Building Renewals and Replacements (BRR). Facilities and Services receives an annual allocation for capital renewal and we created a Building Renewals and Replacements (BRR) task force that met every other week for a year to develop a 3-5 year BRR plan. This past year, an internal, cross-sectional team met bi-weekly for a year to assess each building system. This led to the creation of what we called a 3-year plan, although by design the listed needs exceeded the available funding so in places we also called it a plan for the next five years. We made presentations and prepared a BRR booklet. We used a number of reports that we have commissioned in the development of this plan: Roof Assessment by BTA; ThyssenKrupp Elevator Assessment; AON Fire Protection and Life Safety System Assessments; Bohannon Huston Site Electrical Infrastructure Master Plan; GLHN Utility Development Plan; Accessibility Survey of Campus Buildings; NMSU Data Center Planning Report; Las Cruces Campus Drainage Study; Structural Integrity Study for the NMSU Utility Tunnel; Chemistry and Biochemistry Exhaust System Study; and the Water Master Plan. This Building Renewals and Replacements plan was put together with input from staff in Facility Operations, Project Development and Engineering, Environmental Health and Safety (EHS), the Fire Department, the University Architect, and the University Engineer.

Measure D4: Maintenance Cost Reduction

Describe in detail how this project will affect operating appropriations for the current year and all out-years. Provide a justification if no operating budget impact is anticipated.

Total O&M Budget	\$0	Total O&M Budget AFTER Project	\$0
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D4 Explanation After installation and stabilization of a new HVAC system, the need for persistent NMSU Facilities attention to Chemistry infrastructure will be reduced, with the expectation that proper maintenance going forward will result in a substantially reduced cost of Facilities need and activity at the Chemistry buildings. NMSU performs regularly scheduled preventive maintenance on the building and fume hood ventilation system for the Chemistry Buildings. A cost analysis was generated for the period of Fiscal Year 17 through May 10, 2021. During this time frame NMSU spent \$270,043.00 to perform maintenance and repairs on the systems. Preventive maintenance expenditures account for 52% of the total expense with the remaining 48% on Corrective maintenance. NMSU projects to achieve up to a 75% reduction in annual corrective maintenance labor hours and total work order costs. This equates to an annual maximum reduction of 317 labor hours and \$24,301.00 total work order costs. The savings will be reinvested in scheduled maintenance for Mechanical systems in other academic buildings on campus.

Measure D5: Health, safety, and security

Describe how this project will address major health and safety issues/concerns on campus, including how it will improve physical safety and cybersecurity on campus. Provide selected supporting documentation and reference them in the body of the proposal.

D5 Score Two or more plans ▼

Level of Plan Level 1 ▼

HSS Plan

D5 Explanation The mechanical equipment is in poor mechanical condition. The heating systems were found to be in adequate working order but the cooling coil is only able to maintain 60-65 degree discharge air temperature. The system is over 50 years old, without a heat recovery pre-cooling coil and most likely will never be able to achieve 55 degree discharge air since it is beyond its useful life. The primary function of a fume hood is to capture, contain and remove airborne contaminants. Airflow into a hood is achieved by an exhaust blower which "pulls" air from the laboratory room into and through the hood and exhaust system. Planning the laboratory space to identify airflow configurations, allows adequate supply of air, and supply air diffuser location. Each hood affects a room's ventilation and airflow, so everything must be considered when planning lab space. This project will properly design the laboratory fume hood, along with the mechanical system that supports the exhaust system for the building for a healthy and safe environment.

Appropriation Language \$5,000,000 to plan, design, abate, demolish, construct, renovation, furnish and equip mechanical system and ventilation upgrades for the Chemistry Buildings at New Mexico State University- Las Cruces.

Follow up Questions

Starting Fiscal Year	2021	Expense Type		
Planned Project Start		Planned Project Finish		
Investment to Date	\$0	Funds Needed By		
Discounting Switch	Off	% Complete	0%	
Discount Rates	2022: 0.00%	2023: 0.00%	2024: 0.00%	2025: 0.00%

Forecast

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total	Notes
Pre-Project							Definition: Non-recurring cost to get to an approved and funded project.
Internal Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Software \$	\$0	\$0	\$0	\$0	\$0	\$0	
Hardware \$	\$0	\$0	\$0	\$0	\$0	\$0	
Facilities and Power \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Outside Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Telecom \$	\$0	\$0	\$0	\$0	\$0	\$0	
Other \$	\$0	\$0	\$0	\$0	\$0	\$0	
Total Pre-Project	\$0	\$0	\$0	\$0	\$0	\$0	
Project							Definition: Non-recurring cost to implement and field the product or service.
Internal Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Software \$	\$0	\$0	\$0	\$0	\$0	\$0	
Hardware \$	\$0	\$0	\$0	\$0	\$0	\$0	
Facilities and Power \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Outside Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Telecom \$	\$0	\$0	\$0	\$0	\$0	\$0	
Other \$	\$0	\$0	\$0	\$0	\$0	\$0	
Total Project	\$0	\$0	\$0	\$0	\$0	\$0	
Post-Project							Definition: Recurring cost to support the product or service through the end of the planning horizon.
Internal Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Software \$	\$0	\$0	\$0	\$0	\$0	\$0	
Hardware \$	\$0	\$0	\$0	\$0	\$0	\$0	
Facilities and Power \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Outside Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Telecom \$	\$0	\$0	\$0	\$0	\$0	\$0	
Other \$	\$0	\$0	\$0	\$0	\$0	\$0	
Total Post-Project	\$0	\$0	\$0	\$0	\$0	\$0	
Total Cost	\$0	\$0	\$0	\$0	\$0	\$0	

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total	Notes
Revenue							Definition: Incoming revenue associated with the product or service.
<Source 1> \$	\$0	\$0	\$0	\$0	\$0	\$0	
<Source 2> \$	\$0	\$0	\$0	\$0	\$0	\$0	
<Source 3> \$	\$0	\$0	\$0	\$0	\$0	\$0	
<Source 4> \$	\$0	\$0	\$0	\$0	\$0	\$0	
<Source 5> \$	\$0	\$0	\$0	\$0	\$0	\$0	
<Source 6> \$	\$0	\$0	\$0	\$0	\$0	\$0	
<Source 7> \$	\$0	\$0	\$0	\$0	\$0	\$0	
<Source 8> \$	\$0	\$0	\$0	\$0	\$0	\$0	
Total Revenue	\$0	\$0	\$0	\$0	\$0	\$0	
Cost Reduction							Definition: Money saved that is being spent today. True cost take-out.
Internal Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Software \$	\$0	\$0	\$0	\$0	\$0	\$0	
Hardware \$	\$0	\$0	\$0	\$0	\$0	\$0	
Facilities and Power \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Outside Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Telecom \$	\$0	\$0	\$0	\$0	\$0	\$0	
Other \$	\$0	\$0	\$0	\$0	\$0	\$0	
Total Cost Reduction	\$0	\$0	\$0	\$0	\$0	\$0	
Cost Avoidance							Definition: Preventing money from having to be spent that is not currently being spent today.
Internal Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Staff Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
External Contract Labor \$	\$0	\$0	\$0	\$0	\$0	\$0	
Software \$	\$0	\$0	\$0	\$0	\$0	\$0	
Hardware \$	\$0	\$0	\$0	\$0	\$0	\$0	
Facilities and Power \$	\$0	\$0	\$0	\$0	\$0	\$0	
Internal Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Outside Services \$	\$0	\$0	\$0	\$0	\$0	\$0	
Telecom \$	\$0	\$0	\$0	\$0	\$0	\$0	
Other \$	\$0	\$0	\$0	\$0	\$0	\$0	
Total Cost Avoidance	\$0	\$0	\$0	\$0	\$0	\$0	
Total Benefit	\$0	\$0	\$0	\$0	\$0	\$0	

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Total
Total Pre-Project	\$0	\$0	\$0	\$0	\$0	\$0
Total Project	\$0	\$0	\$0	\$0	\$0	\$0
Total Post-Project	\$0	\$0	\$0	\$0	\$0	\$0
Total Cost	\$0	\$0	\$0	\$0	\$0	\$0
Total Revenue	\$0	\$0	\$0	\$0	\$0	\$0
Total Cost Reduction	\$0	\$0	\$0	\$0	\$0	\$0
Total Cost Avoidance	\$0	\$0	\$0	\$0	\$0	\$0
Total Benefit	\$0	\$0	\$0	\$0	\$0	\$0
Return	\$0	\$0	\$0	\$0	\$0	\$0
Cumulative Return	\$0	\$0	\$0	\$0	\$0	\$0
ROI %	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cumulative ROI %	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Results

Total Investment Required (i.e. Total Cost):	\$0	Return \$:	\$0	Revenue % of Total Benefit:	0.00%
Investment to Date: (i.e. \$ Spent so far):	\$0	ROI %:	0.00%	Cost Reduction % of Total Benefit:	0.00%
Investment Remaining to Go:	\$0	Payback Period (in Years):	0.00	Cost Avoidance % of Total Benefit:	0.00%

Notes: 1) These metrics are designed to depict the strength of the business case by the type of benefit. A business case that has its strength in cost avoidance, particularly in the out-years, is not as strong a business case as one that commits to benefits earlier or that delivers cost reduction. 2) The payback period is the length of time required to recover the cost of the investment.



