

MICHIGAN STATE UNIVERSITY

APPROVED

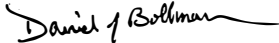
JUNE 21, 2019

**BOARD OF TRUSTEES
MICHIGAN STATE UNIVERSITY**

June 21, 2019

MEMORANDUM

To: Committee on Budget and Finance

From: Daniel J. Bollman 
Vice President for Strategic Infrastructure Planning and Facilities

Subject: **Project Approval - Authorization to Proceed**
T.B. Simon Power Plant - Plant Modernization - RICE

RECOMMENDATION

The Trustee Committee on Budget and Finance recommends that the Board of Trustees authorize the Administration to proceed with the next phase of power generation for campus, including the installation of new reciprocating internal combustion engines ("RICE").

RESOLUTION

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby authorizes the Administration to proceed with the project entitled "T.B. Simon Power Plant - Plant Modernization - RICE," with a project budget of \$47,000,000.

BACKGROUND

Program Need:

MSU's T.B. Simon Power Plant has provided cogenerated steam and electricity to the East Lansing campus for more than five decades. This cogeneration facility continues to provide competitive financial advantages to MSU relative to Big Ten peers and other Michigan universities, and has a proven record of unsurpassed reliability for providing electrical power and steam to campus.

The original generation equipment is almost 60 years old, conventionally considered the end of its useful life. Maintenance costs for outdated boilers and turbines are on the rise.

Changing technology allows MSU to consider a different approach for the next generation of power production. There are technical advances in electrical and steam generation equipment, improvements in the nation's natural gas infrastructure, and lower prices for energy storage solutions. A carefully



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balanced set of strategic investments will enable MSU to modernize its central power plant, save energy and significantly lower costs.

Changes in campus demand for electricity and steam have resulted in sub-optimal operation of our existing cogeneration plant. The demand for electricity will continue to rise much faster than for steam, thus moving the Power Plant's generation equipment further and further away from the balance that is optimal for efficiency. This project addresses the electric generation side of the equation with the installation of Reciprocating internal combustion engines (RICE). Installing separate electric and steam production equipment will result in higher overall plant efficiencies by reducing excess steam production in the existing plant to generate electricity. This will reduce fuel expense and will further reduce emissions of CO₂ (carbon dioxide).

RICE represents the best balance of cost efficiency, reliability, and sustainable electrical generation among currently available solutions. RICE is more responsive than the existing cogeneration equipment and will help firm solar array production during rapidly changing cloud cover. A balanced set of strategic investments, including RICE, will enable MSU to modernize, meet changing needs, and lower costs.

Description of Project:

The Power Plant is located on Service Road in the service district. The project will add natural gas-fired simple cycle RICE and associated balance-of-plant equipment at the existing T.B. Simon Power Plant. The full load electrical output capability of the facility shall be a nominal 27 megawatts, accomplished through the use of three RICE units with "white space" for a future fourth engine. These units will be in an unmanned facility controlled remotely from the main plant with the exception of inspection and maintenance.

The Design Builder is The Christman Company.

Communication Feedback:

Members of the campus community had opportunities to provide feedback during the planning phase. Any concerns they expressed have been addressed in the project design.

The Campus Infrastructure Planning Work Group supports the recommendation to proceed with the project.

As construction proceeds, the schedule will be shared with the campus community.

Project Cost and Timetable:

The budget for this Design Build project is \$47,000,000 including a \$817,000 contingency. The project will be debt financed with debt repayment from the general fund – utilities.

Construction is expected to begin in June 2019, with substantial completion in December 2020.

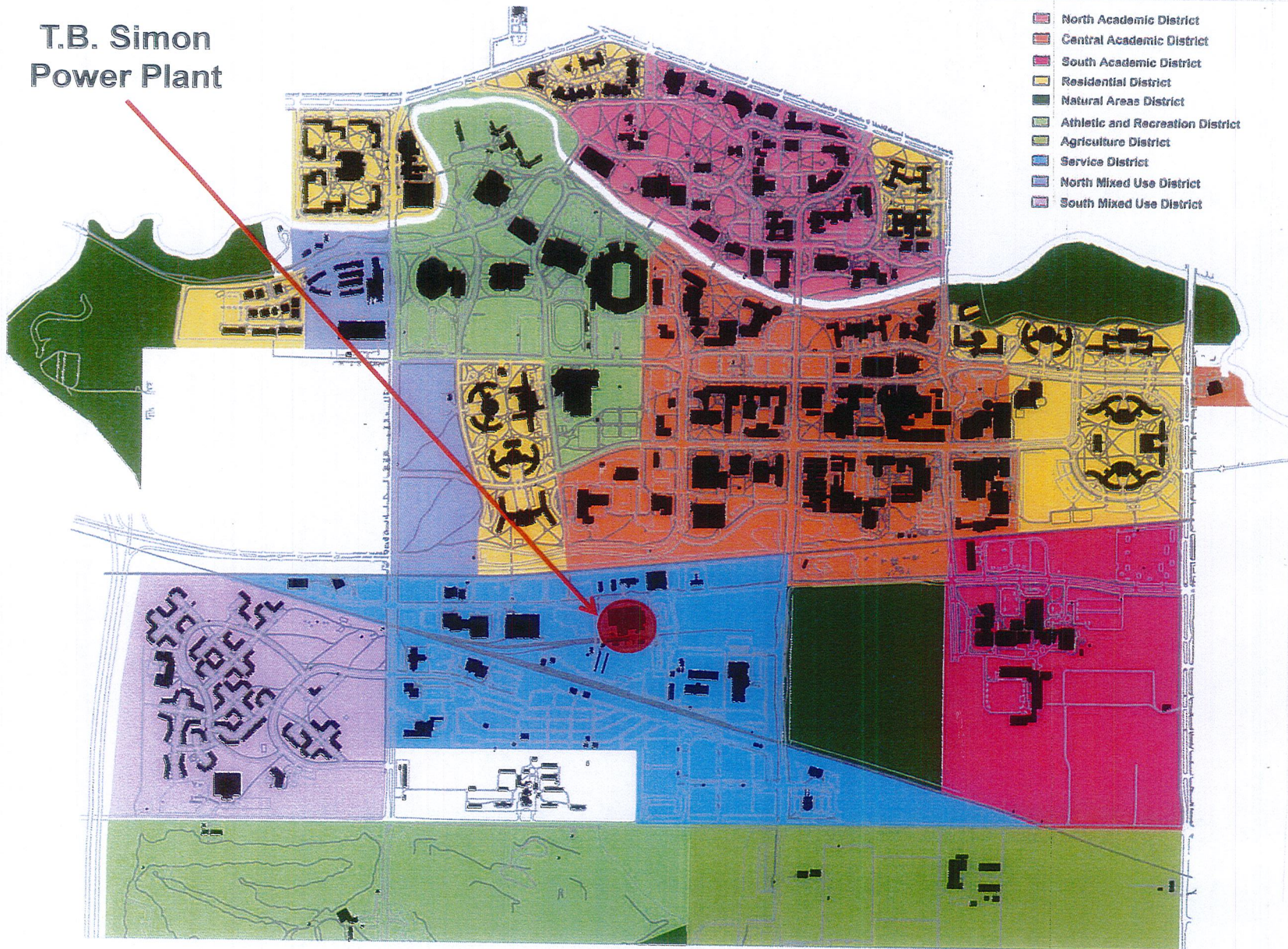
cc: Board of Trustees, S. Udpa, J. Youatt, N. Barr, K. Wilbur, M. Zeig,
B. Quinn, V. Gore, M. Haas, J. Gaboury, B. Kranz, M. McCabe,
J. Mumma, J. Rayis, L. Adams, K. Oosterhoff, W. Bauer, S. Jett,
C. Carter, L. Senecal

CP16124/CP17197

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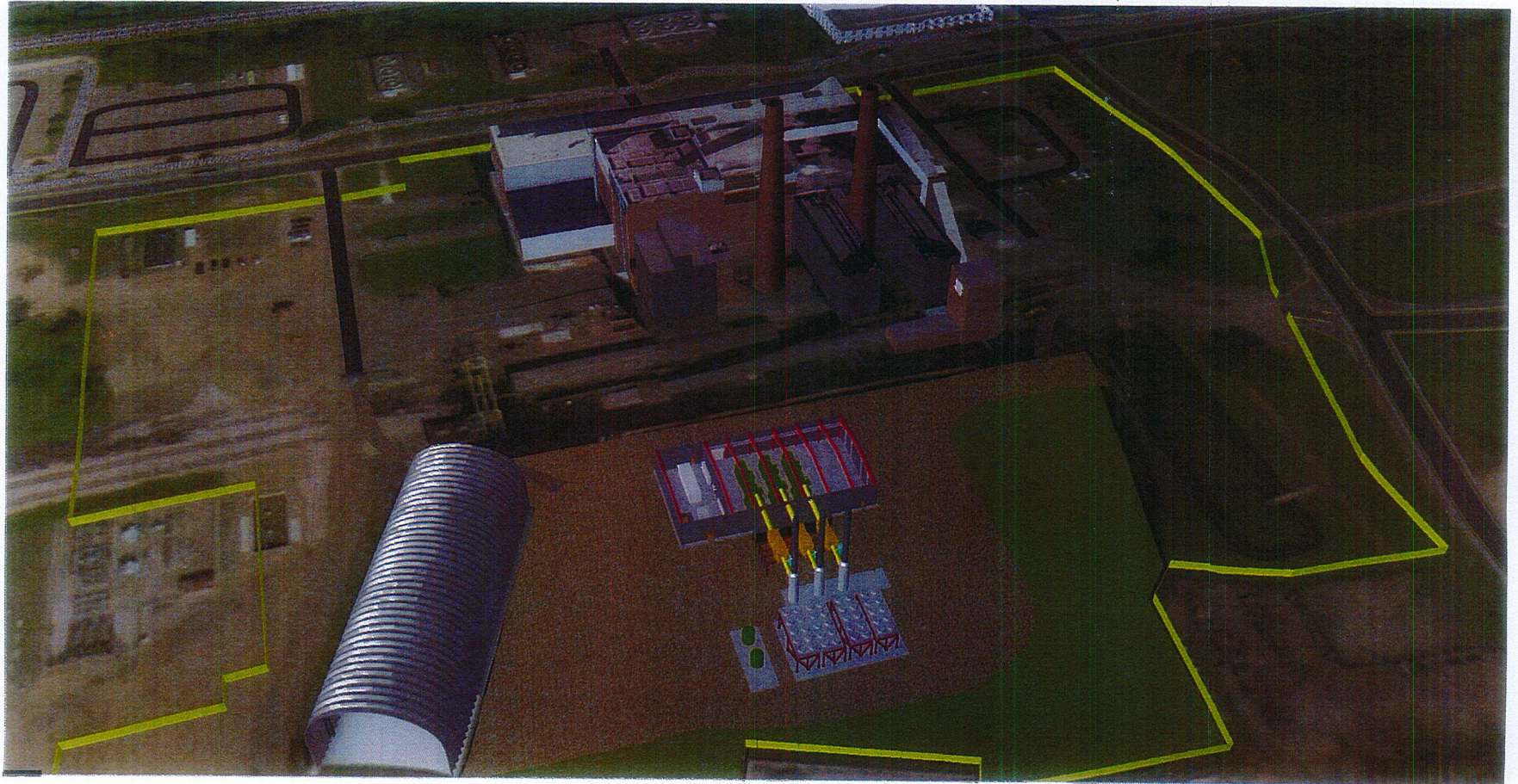
T.B. Simon
Power Plant



Project Approval – Authorization to Proceed
T.B. Simon Power Plant – Plant Modernization - RICE

MICHIGAN STATE
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Site Rendering



MICHIGAN STATE UNIVERSITY

October 16, 2017

MEMORANDUM

To: Trustee Finance Committee

From: Daniel J. Bollman *Daniel J. Bollman*
Associate Vice President for Strategic Infrastructure Planning
and Facilities

Subject: **Authorization to Plan**
T.B. Simon Power Plant - Plant Modernization



RECOMMENDATION

The Trustee Finance Committee recommends that the Board of Trustees authorize the Administration to plan for the next phases of power generation for campus, including new production capability at the T. B. Simon Power Plant.

RESOLUTION

BE IT RESOLVED, that the Board of Trustees of Michigan State University hereby authorizes the Administration to plan for three projects under the title of "T.B. Simon Power Plant - Plant Modernization."

BACKGROUND

Program Need:

MSU's T.B. Simon Power Plant has provided cogenerated steam and electricity to the East Lansing campus for more than five decades. This cogeneration facility continues to provide competitive financial advantages to MSU relative to Big Ten peers and other Michigan universities, and has a proven record of unsurpassed reliability for providing electrical power and steam to campus.

The original generation equipment is almost 60 years old, conventionally considered the end of its useful life. Maintenance costs for outdated boilers and turbines are on the rise. The campus demand for electricity will continue to rise much faster than for steam, thus moving the Power Plant's generation equipment further and further away from the balance that is optimal for efficiency.

Changing technology allows MSU to consider a different approach for the next generation of power production. There are technical advances in electrical and steam generation equipment, improvements in the nation's natural gas infrastructure, and lower prices for energy storage solutions. A



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carefully balanced set of strategic investments will enable MSU to modernize its central power plant, save energy and significantly lower costs.

General Description of the Project:

The transition to the next generation of power generation is expected to involve three separate upgrades. As planning begins, project teams will examine options to deliver each component as efficiently as possible, including coordination with other infrastructure needs. Each will return for Board action at the Authorization to Proceed and, if appropriate, Bid and Contract Award stages:

- **RICE**
Install a high-efficiency electrical generation facility consisting of four Reciprocating Internal Combustion Engines (RICE) with a combined power of at least 35 Megawatts, which will increase efficiency significantly.
(CP17197; estimate of \$38,000,000 - \$40,000,000)
- **Medium Pressure Steam Boiler**
Install a medium-pressure steam boiler, which can provide up to 200,000 pounds of steam to campus and would allow retiring two 50-year old boilers and steam turbines.
(CP17198; estimate of \$6,000,000 - \$7,000,000)
- **Reverse Osmosis**
This system would replace the existing boiler water treatment system, eliminating the need for large quantities of costly chemicals and result in significant environmental and safety benefits.
(CP17199; estimated to be less than \$1,000,000)

The Power Plant is located on Service Road in the service district and these projects would be consistent with the Campus Land Use Master Plan.

Communication Plan:

Input will be solicited from the campus community during the planning phase.

Preliminary Project Cost Information:

Based on cost experience for similar projects and current pricing information, preliminary project cost estimate ranges have been developed for these three projects, and the aggregate estimated project costs are \$45,000,000-\$48,000,000. The estimated cost for each project may change as that project and its scope are refined during the planning process. Each project's cost will be presented in the request for Authorization to Proceed.

The source of funds for the project is expected to be the general fund - utilities.

cc: Trustee Policy Committee, L. Simon, J. Youatt, S. Udpa, B. Beekman, R. Noto, V. Gore, M. Haas, J. Gaboury, B. Kranz, M. McCabe, J. Mumma, J. Rayis, J. Samuels, W. Bauer, R. Ellerhorst

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