Office of Audits
Office of Inspector General
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Audit of PBS's American Recovery and Reinvestment Act Sustainability Results

Report Number A150026/P/R/R18003
September 21, 2018

Executive Summary

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Why We Performed This Audit

The American Recovery and Reinvestment Act of 2009 (Recovery Act) provided GSA with funding to convert its buildings into high-performance green buildings. GSA's Public Buildings Service (PBS) established the *Minimum Performance Criteria for Recovery Act Projects* in an effort to ensure that Recovery Act modernization projects were converting buildings to high-performance green buildings. As of July 2012, PBS had established 39 minimum performance criteria related to energy and water reduction, indoor environmental quality, and construction materials.

The objective of our audit was to determine whether buildings that received full or partial modernizations under the Recovery Act are meeting their minimum performance sustainability criteria.

What We Found

The Recovery Act provided GSA with $3.2 billion for full and partial building modernizations to convert federal buildings into high-performance green buildings. Although PBS established minimum performance criteria for its Recovery Act projects, PBS did not always implement high-performance green building measures to achieve the criteria, or have the ability to gauge the effectiveness of the measures that were implemented. Specifically, we reviewed seven minimum performance criteria across 15 Recovery Act full or partial modernization projects and found that the projects did not meet 40 percent of the applicable minimum performance criteria. The projects we reviewed represented 49 percent ($1.5 billion) of the $3.2 billion the Recovery Act provided GSA for full and partial building modernizations.

We identified three general reasons that projects did not meet the minimum performance criteria: (1) ineffective management control and oversight, (2) project teams implemented high-performance green building measures that fell short of the criteria, or (3) PBS lacked the data needed to assess whether the projects met the minimum performance criteria.

What We Recommend

We recommend that the PBS Commissioner:

1. Ensure that senior management provides oversight of the implementation of the minimum performance criteria in future capital projects, including documenting approval to waive these criteria.

2. Review Recovery Act projects and implement building improvements needed to meet the minimum performance criteria.

3. Assess results of implemented high-performance green building measures in future capital projects by:
    a. Using appropriate and consistent baselines for energy and water use;
    b. Gathering necessary data and information from contractors and delegated agencies to gauge compliance with criteria; and
    c. Ensuring methods are in place to compare actual building performance against all minimum performance criteria.

In his response, the Commissioner of the Public Buildings Service generally agreed with our recommendations but disagreed with certain audit conclusions. PBS's written comments are included in their entirety as ***Appendix D***. PBS's response included two attachments; however, we did not include those attachments due to the volume of the documentation. We will make the attachments available upon request.

We made certain adjustments to our report based on the information provided by PBS. Those revisions, as well as our specific responses to the Commissioner's comments, are included in the ***Conclusion*** section of this report.

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Introduction

We performed an audit of GSA's Public Buildings Service's (PBS's) implementation of high-performance green building sustainability measures in modernization projects. These projects were funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act).

Purpose

The audit was included in our *Fiscal Year 2015 Audit Plan* as part of the GSA Office of Inspector General's continuing oversight of projects funded by the Recovery Act. The Recovery Act provided GSA with funding to convert its buildings into high-performance green buildings.

PBS established the *Minimum Performance Criteria for Recovery Act Projects* in an effort to ensure that Recovery Act modernization projects were converting buildings to high-performance green buildings. As of July 2012, PBS established 39 minimum performance criteria related to energy and water reduction, indoor environmental quality, and construction materials.

Objective

The objective of our audit was to determine whether buildings that received full or partial modernizations under the Recovery Act are meeting their minimum performance sustainability criteria.

See ***Appendix A*** – Scope and Methodology for additional details.

Background

The Recovery Act provided GSA with funding to convert its facilities into high-performance green buildings, as defined in the Energy Independence and Security Act of 2007 (EISA). EISA defines high-performance green buildings as buildings that reduce energy, water, and material resource use; improve indoor environmental quality; and reduce negative impacts on the environment. Under the Recovery Act, PBS designated high-performance green buildings under three project categories – full and partial modernizations, limited scope, and small (see *Figure 1*).

Figure 1 – High-Performance Green Building Recovery Act Projects

Project Category	Number of Projects	Recovery Act Funding[1]
Full and Partial Modernizations	45	$3,211,751,000
Limited Scope	201	880,014,000
Small	236	196,725,000
Total	**482**	**$4,288,490,000**

Recovery Act high-performance green building modernizations addressed federal mandates for a more sustainable building inventory. In 2006, the *Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding* established the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings* (Guiding Principles). Executive Order 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* (January 24, 2007) and Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* (October 5, 2009) were in effect at the time of GSA's Recovery Act projects. The executive orders required federal buildings to follow the Guiding Principles.[2]

To adhere to the Guiding Principles, GSA developed minimum performance criteria for Recovery Act-funded projects. These criteria outlined the enhancements needed to adhere to the Guiding Principles and transform federal buildings into high-performance green buildings in a variety of building performance areas, including energy and water use, renewable energy systems, bio-based content in construction materials, and waste management. The criteria also direct projects to achieve a Leadership in Energy and Environmental Design (LEED) Silver certification, at a minimum. As of July 2012, PBS had established a total of 39 minimum performance criteria.[3]

PBS also developed separate requirements for implementing the minimum performance criteria in full and partial building modernizations. In a full modernization, every minimum performance criterion must have been met or waived, as appropriate. In a partial modernization, the minimum performance criteria were applied only as relevant to the individual components designated for repair and alteration under approved project scopes.

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[1] PBS's *Revised American Recovery & Reinvestment Act Spending Plan #12* (June 2015).

[2] In March 2015, Executive Order 13693, *Planning for Federal Sustainability in the Next Decade*, revoked Executive Orders 13423 and 13514 and required the Council on Environmental Quality to revise the Guiding Principles. In May 2018, Executive Order 13834, *Efficient Federal Operations*, revoked Executive Order 13693. As of this audit report date, GSA is developing a plan to modify, replace, or rescind government-wide guidance related to energy and environmental performance. Executive Order 13834 will establish new statutory requirements and require annual reporting on building conformance.

[3] In a December 2016 update, PBS consolidated the number of minimum performance criteria to 21 to conform with the revised Guiding Principles that the Council of Environmental Quality established after Executive Order 13693 was issued.

Examples of individual components in partial modernizations include upgrading heating, ventilation, and air conditioning (HVAC) systems; adding high-efficiency lighting and dimming sensors; and upgrading windows to reduce the load on HVAC systems.

In accordance with PBS's *Minimum Performance Criteria for Recovery Act Projects,* project teams were required to obtain a waiver from the Regional Recovery Executive if they decided not to include an applicable criterion in a full or partial building modernization project. To obtain a waiver, a project team had to send a request for approval to the Regional Recovery Executive, including supporting documentation, as early in the project as possible.[4] The Regional Recovery Executive's approval was required before the project team could proceed to the next project phase. The project team was responsible for maintaining documentation supporting the Regional Recovery Executive's decision in the project file.

PBS's methodology for tracking sustainability progress has evolved since the Recovery Act was enacted. Initially, PBS developed minimum performance criteria checklists, which were spreadsheets that project teams used to indicate which minimum performance criteria would be included in the project. In June 2010, GSA created the Recovery Act High-Performance Green Building Database Online (RAHD) to standardize and facilitate the collection, review, and sharing of design and construction information to evaluate progress towards implementing minimum performance criteria.

In April 2013, PBS replaced RAHD with the Green Building Upgrade Information Lifecycle Database (gBUILD). The gBUILD 1.4 User Guide describes the system's purpose:

> gBUILD standardizes and streamlines [high-performance green building]-related data collection for all project types. By centralizing data across different funding programs, gBUILD enables PBS to monitor a comprehensive pipeline of historical and future projects to proactively coordinate and optimize a portfolio of building investments towards achieving PBS' [sic] sustainability goals at the national and regional level.

While the vast majority of Recovery Act projects are now complete, PBS has started using gBUILD for all modernization and new construction projects. PBS uses gBUILD to help assess and report on compliance with sustainability goals in support of both Recovery Act and non-Recovery Act projects.

[4] With Recovery Act projects nearly complete, Regional Recovery Executives are no longer part of the waiver process. Currently, PBS project delivery subject matter experts review and validate when criteria are omitted from construction projects.

Results

The Recovery Act provided GSA with $3.2 billion for full and partial building modernizations to convert federal buildings into high-performance green buildings. To help ensure that its Recovery Act projects would meet that goal, PBS developed its *Minimum Performance Criteria for Recovery Projects* to identify high-performance green building criteria to incorporate into the initial scoping of all projects. However, we reviewed seven minimum performance criteria across 15 Recovery Act projects and found that the projects did not meet 40 percent of the applicable minimum performance criteria. The projects we reviewed represented 49 percent ($1.5 billion) of the $3.2 billion the Recovery Act provided GSA for full and partial building modernizations.

We identified three general reasons that projects did not meet the minimum performance criteria: (1) ineffective management control and oversight, (2) project teams implemented high-performance green building measures that fell short of the criteria, or (3) PBS lacked the data needed to assess whether the projects met the minimum performance criteria.

Finding – PBS Recovery Act modernization projects did not meet 40 percent of the minimum performance criteria tested.

PBS established *Minimum Performance Criteria for Recovery Projects* to identify high-performance green building criteria to incorporate into its Recovery Act modernization projects. These criteria were meant to help PBS meet federal mandates to work toward a more sustainable building inventory and create high-performance green buildings that reduce energy, water, and material resource use; improve indoor environmental quality; and reduce negative impacts on the environment.

However, the projects that we reviewed met only 51 of the 87 applicable minimum performance criteria that we tested. For some projects, ineffective internal controls allowed PBS project teams to forego high-performance green building measures designed to meet the minimum performance criteria without obtaining management approval. We also observed instances where project teams implemented measures to meet the minimum performance criteria, but the projects failed to meet the criteria. In other cases, PBS lacked the data, metering, or other methods to determine the effectiveness of the implemented measures.

Criteria Tested

We reviewed 15 Recovery Act projects and tested each project's compliance with the following seven minimum performance criteria:

- Energy efficiency;
- Implementation of renewable energy systems;
- Implementation of solar hot water systems;

- Indoor water reduction;
- Outdoor water reduction;
- Implementation of bio-based content into construction; and
- Construction waste recycling.

We found 18 instances where a minimum performance criterion did not apply to a particular project. For example, the solar hot water criterion only applied to full building modernizations, and thus was inapplicable to the five partial building modernizations we reviewed. The outdoor water criterion did not apply to projects we reviewed that had little to no landscaping or need for irrigation. Further, one of the projects in our sample was an infrastructure project where six of the seven criteria did not apply. Given this, we based our conclusions on only those criteria that we deemed applicable to each building.

Projects Did Not Meet Minimum Performance Criteria Due to Ineffective Management Control and Oversight

PBS's internal controls designed to ensure that projects incorporated high-performance green building measures when practicable were ineffective. Due to inadequate management oversight, project teams were able to omit criteria that may have helped meet the Recovery Act's goal of improved sustainability and building performance. Specifically, we found that of the 15 projects we reviewed, PBS did not:

- Implement solar hot water systems for 6 projects;
- Implement renewable energy systems for 6 projects;
- Use bio-based construction materials for 5 projects; and
- Attempt to recycle, salvage, or reuse construction waste for 1 project.

PBS's *Minimum Performance Criteria for Recovery Act Projects* directed project teams to incorporate high-performance green building measures into the scoping of all projects. The minimum performance criteria required that project teams seek a waiver before excluding any applicable criterion. To obtain a waiver, a project team was required to notify the Regional Recovery Executive as early as possible, with supporting documentation, and obtain the Regional Recovery Executive's approval to waive any criterion before proceeding to the next project phase. The project teams were also required to include the approved waiver in the project file.

In our sample of seven minimum performance criteria for 15 Recovery Act buildings, we found 18 instances where PBS project teams did not attempt to meet minimum performance criteria and should have requested a waiver. However, the project teams obtained a waiver in only 1 of these 18 instances. Although project teams cited several reasons for excluding criteria (for example, the criteria fell outside of project scope, yielded an insufficient life cycle cost payback, or was insufficiently funded), they did not request the required waivers to forego these measures. As a result, PBS management may not have possessed the information necessary to

make effective decisions about these projects and to evaluate progress in meeting Recovery Act goals.

Projects Fell Short of Energy Savings, Water Reduction, and Construction Waste Recycling Minimum Performance Criteria

We identified eight instances in which PBS attempted to meet minimum performance criteria, but fell short of doing so. Specifically, we found that PBS did not meet:

- The energy efficiency criterion for 5 projects;
- The indoor water use reduction criterion for 1 project;
- The outdoor water use reduction criterion for 1 project; and
- The construction waste recycling criterion for 1 project.

Energy Savings. This minimum performance criterion directs full and partial modernization projects to achieve a 20 to 30 percent reduction in energy use compared to an American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1-2007 baseline building, or a 20 percent reduction from the 2003 historical building baseline.[5]

We identified five projects that implemented measures to improve energy efficiency but did not meet the minimum performance criterion for energy efficiency:

- Anthony J. Celebrezze Federal Building;
- Federal Center South Building 1202;
- GSA Headquarters Building;
- Lafayette Federal Building; and
- Mary E. Switzer Federal Building.

Although each of the five projects implemented energy efficiency measures, the amount of energy savings fell short of the minimum performance criterion. The results for these projects are identified and discussed in ***Appendix C***, pages C-1 through C-3.

PBS officials told us that these projects did not meet their energy goals for a variety of reasons. These officials noted that, in some cases, Recovery Act projects were only one phase of a larger modernization project, and the full benefit of the implemented measures may not be realized until the full modernization is complete. We also found instances where PBS used baselines that were not part of the minimum performance criterion. For example, some projects used a historical average baseline for energy, instead of the ASHRAE baseline or 2003 historical baseline as directed by the minimum performance criterion.

[5] ASHRAE provides minimum requirements for the energy-efficient design of buildings based on building characteristics such as size and use.

Indoor Water Reduction. The GSA Headquarters Building did not meet the minimum performance criterion for indoor water reduction. The minimum performance criterion directs projects to achieve a 20 percent reduction in indoor water use compared to a plumbing code standard or the 2007 historical building baseline. Although the project implemented indoor water reduction measures, the building experienced an increase in indoor water use. The project team attributed the increased water use to the installation of new chillers in the central air conditioning plant.

Outdoor Water Reduction. The Cesar E. Chavez Memorial Building did not meet the minimum performance criterion for outdoor water reduction. The minimum performance criterion directs projects to achieve a 50 percent reduction in outdoor water use compared to the 2007 historical building baseline. Although the project implemented outdoor water reduction measures, the building came up short of the minimum performance criterion.

Construction Waste Recycling. The U.S. Custom House did not meet the minimum performance criterion for waste recycling. The minimum performance criterion directs projects to salvage, recycle, or reuse at least 50 percent of construction and demolition waste generated on the project. Although the project salvaged, recycled, or reused some waste, the building did not meet the minimum performance criterion.

PBS Cannot Determine the Effectiveness of All High-Performance Green Building Measures

PBS did not have the mechanisms in place to determine if projects are meeting their high-performance green building minimum performance criteria in 10 of 87 applicable instances. As a result, PBS cannot determine the effectiveness of all high-performance green building measures implemented. We found that PBS could not determine:

- Benefits of solar hot water systems for 4 projects;
- Outdoor water use reduction for 1 project;
- Energy efficiency data for 1 project;
- Indoor water use reduction for 2 projects;
- Bio-based construction materials use for 1 project; and
- Construction recycling rate for 1 project.

According to GSA's minimum performance criteria for Recovery Act projects, all criteria within the project scope must be met or waived. However, PBS project teams had no mechanisms in place to determine if the projects achieved 10 of the applicable minimum performance criteria that we tested. For example, the solar hot water systems implemented in four of the projects that we reviewed have a goal of meeting 30 percent of the building's hot water demand. However, PBS could not determine how much hot water the systems were generating because the buildings lacked metering equipment necessary to measure the actual amount of hot water generated through the solar hot water systems.

Outdoor water systems presented a similar issue. One project we reviewed included measures to reduce outdoor water use, but PBS could not determine the effectiveness of these measures because indoor and outdoor water use was not metered separately. Therefore, the project team was not able to determine the savings derived from the outdoor water system implemented.

Furthermore, PBS could not determine if one project met the minimum performance criteria for energy efficiency or indoor water reduction. PBS did not have energy or indoor water use data available for review. PBS delegated the building's operations, maintenance, and alteration to the tenant agency, and that agency maintained all building utility data. We asked PBS to request the building utility data. A PBS official informed us that he made numerous requests for the data from the tenant agency, but that the tenant agency ultimately did not provide the requested information.

Additionally, PBS could not determine the indoor water reduction for another project. For that project, the building was mostly unoccupied because of subsequent construction phases, so proper measurements of water use and potential reduction would have to be done at a later time.

Similarly, PBS could not determine bio-based content use for one project. The project manager said that PBS would require a separate contract to obtain this information from the contractor. For this project, PBS could also not determine the recycling rate. The project manager again said PBS would require a separate contract to obtain the recycling rate from the contractor.

Without mechanisms in place to evaluate the effectiveness of high-performance green building measures, PBS does not have assurance that the measures implemented are effective in saving energy or water, or meeting federal mandates to improve the environmental performance of its buildings. All high-performance green building measures should be tracked to ensure that they are working as intended and that any failures in the measures are detected and addressed.

Conclusion

We audited 15 Recovery Act full or partial modernization projects, which represented 49 percent ($1.5 billion) of the $3.2 billion the Recovery Act provided GSA for these projects. We found that the projects did not meet 40 percent of the applicable minimum performance criteria we tested. The other applicable criteria were either not implemented, not met, or PBS lacked the data to determine if they were met.

PBS has opportunities to ensure that projects are meeting their minimum performance criteria for sustainability through improvements to management control and oversight. In particular, PBS should ensure that senior management is involved in decisions to include or exclude high-performance green building improvements from modernization projects. PBS management should also put controls in place to ensure that future capital projects are better able to meet minimum performance criteria by establishing appropriate baselines for energy and water use, and to gather all data and information needed to track building performance from contractors and delegated agencies.

Additionally, PBS should implement methods to track building performance against all minimum performance criteria. In doing so, PBS could consider enhanced use of existing processes such as its Light-Touch Measurement and Verification process. PBS currently uses this process to identify solutions for underperforming Recovery Act projects that are not meeting energy use goals. Through this process, PBS Central Office personnel and the project's regional team hold discussions on the building and analyze energy data to decide what actions should be taken to improve performance. By further developing this process and ensuring there are processes in place to effectively gauge the results of all building sustainability measures, PBS could be better positioned to identify buildings that are falling short of applicable criteria and take actions to improve performance.

Recommendations

We recommend that the PBS Commissioner:

1. Ensure that senior management provides oversight of the implementation of the minimum performance criteria in future capital projects, including documenting approval to waive these criteria.

2. Review Recovery Act projects and implement building improvements needed to meet the minimum performance criteria.

3. Assess results of implemented high-performance green building measures in future capital projects by:
    a. Using appropriate and consistent baselines for energy and water use;
    b. Gathering necessary data and information from contractors and delegated agencies to gauge compliance with criteria; and
    c. Ensuring methods are in place to compare actual building performance against all minimum performance criteria.

GSA Comments

In his undated response to our report, provided on July 30, 2018, the PBS Commissioner disagreed with three aspects of our report finding.

First, PBS disagreed that it had ineffective management control and oversight of MPC implementation during the Recovery Act. PBS asserted that it had management controls in place during the life cycle of Recovery Act projects. However, PBS was unable to provide documentation supporting this oversight.

Second, PBS did not agree with our assessment of the extent to which the projects we reviewed met all applicable MPCs. PBS stated that it was not necessary or appropriate to meet every MPC for every project. However, our methodology accounted for instances where an MPC was not applicable or was appropriately waived by PBS.

Third, PBS disagreed with certain project-specific findings and provided technical comments supporting its assertions. After review of these comments, we concluded that one project met the MPC for bio-based construction materials and adjusted our report accordingly.

While PBS generally concurred with our report recommendations, it provided that with respect to our recommendation to compare actual performance against all MPCs, it does not agree that it is required to submeter solar water heating systems or outdoor water usage. PBS stated that it is not typically cost effective to submeter these systems. Our recommendation does not advocate for the installation of cost ineffective metering systems. However, as PBS expended $1.5 billion on the sustainability improvements for the projects we reviewed, it should determine the best approach to evaluate actual performance.

PBS's comments are included in their entirety in ***Appendix D***. PBS's response included two attachments; however, we did not include those attachments due to the volume of the documentation. We will make the attachments available upon request.

Audit Team

This audit was managed out of the Real Property and Finance Audit Office and conducted by the individuals listed below:

Marisa A. Roinestad	Associate Deputy Assistant Inspector General for Auditing
Kevin Gallagher	Audit Manager
Timothy Keeler	Auditor-In-Charge
John Foss	Management Analyst

Appendix A – Scope and Methodology

Our audit scope was limited to a judgmental sample of 15 Recovery Act projects. The 15 projects that we sampled represented 49 percent of the spending for PBS's Recovery Act full and partial modernizations ($1.5 billion of $3.2 billion). The sample consisted of ten full and five partial modernization projects. We excluded limited scope projects from the sample because their project scopes include fewer applicable minimum performance criteria.

GSA's Great Lakes, Rocky Mountain, Northwest/Arctic, and National Capital regions received the most funding for Recovery Act full and partial modernizations. Our sample includes the three or four projects with the most funding from each of these regions.

We judgmentally selected a sample of seven minimum performance criteria that we identified as having the greatest impact on building sustainability, while also being objectively measureable. These enhancements include energy and water use, renewable energy systems, bio-based content in construction materials, and waste management. We reviewed our sample of seven minimum performance criteria across the 15 Recovery Act projects to determine if the projects met sustainability criteria.

To accomplish our objective, we:

- Reviewed the requirements of the Recovery Act, Energy Policy Act of 2005, Energy Information and Security Act of 2007, the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings*, Executive Order 13423, Executive Order 13514, *Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding*, GSA's minimum performance criteria for existing buildings, and GSA's minimum performance criteria for new construction/full modernizations;
- Analyzed energy and water use data for the sample projects;
- Reviewed PBS's Light-Touch Measurement and Verification review process, procedures, and related documents;
- Reviewed building baseline data, key performance indicators, and minimum performance criteria statuses and comments in gBUILD;
- Reviewed project file documentation related to energy analysis and LEED certifications;
- Obtained supplementary documentation not found in the project files from PBS's electronic Project Management database and the Energy Usage Analysis System;
- Reviewed prior GSA Office of Inspector General and U.S. Government Accountability Office reports on GSA's sustainability results; and
- Interviewed and obtained documentation from PBS project teams, regional energy coordinators, and Regional Recovery Executives.

Appendix A – Scope and Methodology (cont.)

We conducted the audit between October 2015 and May 2016, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our finding and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our finding and conclusions based on our audit objective.

Internal Controls

Our assessment of internal controls was limited to those necessary to address the objective of the audit. Identified internal control issues are discussed in the Results section of this report.

Appendix B – Recovery Act Projects in Audit Sample

Building	Region	Modernization Type	Recovery Act Spending
Anthony J. Celebrezze Federal Building	Great Lakes	Partial	$115,521,810
John C. Kluczynski Federal Building	Great Lakes	Partial	$99,673,266
Bishop Henry Whipple Federal Building	Great Lakes	Full	$170,822,328
Birch Bayh U.S. Courthouse	Great Lakes	Full	$69,644,157
U.S. Custom House	Rocky Mountain	Partial	$26,971,549
Byron Rogers Federal Building	Rocky Mountain	Full	$155,925,148
Cesar E. Chavez Memorial Building	Rocky Mountain	Partial	$38,633,013
Denver Federal Center (Infrastructure)	Rocky Mountain	Partial	$63,604,965
Edith Green-Wendell Wyatt Federal Building	Northwest/Arctic	Full	$138,951,200
Federal Center South Building 1202	Northwest/Arctic	Full	$75,088,226
Thomas S. Foley U.S. Courthouse	Northwest/Arctic	Full	$43,349,182
GSA Headquarters Building	National Capital	Full	$165,138,798
Herbert Hoover Building	National Capital	Full	$188,113,424
Lafayette Building	National Capital	Full	$122,410,973
Mary E. Switzer Building	National Capital	Full	$67,003,864

Appendix C – Minimum Performance Criteria Audit Results by Building

Energy Efficiency

For full modernization projects, the minimum performance criterion (MPC) states that buildings should achieve at least a 30 percent reduction in energy use compared to an American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1-2007 baseline building. ASHRAE provides minimum requirements for the energy-efficient design of buildings based on the building characteristics, such as size and use. For partial modernizations, buildings should achieve at least a 20 percent reduction in energy use compared to an ASHRAE Standard 90.1-2007 baseline building or the actual energy use of the building in 2003.

Building	Project met MPC	MPC was not implemented	Project did not meet MPC	Could not be determined	MPC did not apply
Anthony J. Celebrezze Federal Building			X		
John C. Kluczynski Federal Building	X				
Bishop Henry Whipple Federal Building	X				
Birch Bayh U.S. Courthouse	X				
U.S. Custom House	X				
Byron Rogers Federal Building	X				
Cesar E. Chavez Memorial Building	X				
Denver Federal Center (Infrastructure)					X
Edith Green-Wendell Wyatt Federal Building	X				
Federal Center South Building 1202			X		
Thomas S. Foley U.S. Courthouse	X				
GSA Headquarters Building			X		
Herbert Hoover Building				X	
Lafayette Building			X		
Mary E. Switzer Building			X		
Totals	**8**	**0**	**5**	**1**	**1**

Appendix C – Minimum Performance Criteria Audit Results by Building (cont.)

See notes below for how we categorized each project's compliance with this MPC:

1. The Anthony J. Celebrezze Federal Building's target energy use was 82,783 British Thermal Units per gross square foot (BTU/GSF), which would have been a 20 percent reduction from its 2003 baseline. In 2015, the building's energy use was 85,279 BTU/GSF, which was above the target. As a result, we classified this project as not meeting the MPC at the time of our testing. Subsequently, PBS provided 2017 data showing the building's energy use was 72,869 BTU/GSF, which was below the target.
2. The John C. Kluczynski Federal Building is part of a campus. We calculated its energy target using 2009 historical data of the campus, which was used by the project team. A 20 percent reduction results in an energy target of 78.91 thousand BTUs per gross square foot (kBTU/GSF). In 2015, the campus used 73.84 kBTU/GSF, which was below the target.
3. The Bishop Henry Whipple Federal Building project team used an average of Fiscal Years 2008 and 2009 historical data for its baseline rather than an ASHRAE standard, which the MPC requires for full modernizations. However, because the project reduced energy by 42 percent compared to the baseline, we concluded that the ASHRAE standard would have been met.
4. The Birch Bayh U.S. Courthouse project team used an average of Fiscal Years 2007 and 2008 historical data for its baseline rather than an ASHRAE standard, which the MPC requires for full modernizations. However, because the project reduced energy by 40 percent compared to the baseline, we concluded that the ASHRAE standard would have been met.
5. The U.S. Custom House's target energy use was 13,675 million BTU (mmBTU), which would have been a 20 percent reduction from its 2003 baseline. In 2015, the building's energy use was 13,023 mmBTU, which was below the target.
6. The Byron Rogers Federal Building's target energy use was 26,330 mmBTU, based on a 30 percent reduction from the ASHRAE standard. In 2015, the building's energy use was 22,950 mmBTU, which was below the target.
7. The Cesar E. Chavez Memorial Building's target energy use was 13,370 mmBTU, based on a 20 percent reduction from the ASHRAE standard. In 2015, the building's energy use was 8,234 mmBTU, which was below the target.
8. The Denver Federal Center was an infrastructure modernization to replace domestic water and fire protection systems, sewer lines, a storm drainage system, and to provide upgrades to the electrical system. The MPC for energy did not apply to this project.
9. The Edith Green-Wendell Wyatt Federal Building's target energy use was 16,388 mmBTU, based on a 30 percent reduction from the ASHRAE standard. In 2015, the building's energy use was 15,202 mmBTU, which was below the target.

Appendix C – Minimum Performance Criteria Audit Results by Building (cont.)

10. The Federal Center South Building 1202's target energy use was 27.65 thousand BTUs per square foot (kBTU/sqft), based on a 30 percent reduction from the ASHRAE standard. In 2015, the building's energy use was 33.27 kBTU/sqft, which was above the target.
11. The Thomas S. Foley U.S. Courthouse's target energy use was 17,251 MBTU, based on a 30 percent reduction from the ASHRAE standard. In 2015, the building's energy use was 9,605 MBTU, which was below the target.
12. The GSA Headquarters Building's target energy use was 37,161 MBTU, based on a 30 percent reduction from the ASHRAE standard. In 2015, the building's energy use was 56,270 MBTU, which was above the target. Although the Recovery Act phase of the project is complete, the second phase of the project has not begun. This second phase of the modernization project may affect energy usage rates.
13. The Herbert Hoover Building's target energy use was 38,238 mmBTU, based on a 30 percent reduction from the ASHRAE standard. We could not determine if the target was met because the project did not have energy use data available for review. The building's operations, maintenance, and alteration were delegated by GSA to the tenant agency. GSA officials informed us that all building utility data is with the delegated agency. We asked PBS to request the building utility data, but PBS never received it from the tenant agency. Although the Recovery Act phase of the project is complete, the project is still ongoing with additional phases that may affect energy usage rates.
14. The Lafayette Building's target energy use was 13,969 MBTU, based on a 30 percent reduction from the ASHRAE standard. In 2015, the building's energy use was 28,078 MBTU, which was above the target. Although the Recovery Act phase of the project is complete, during audit fieldwork, the project was still ongoing in a second phase that may affect energy usage rates.
15. The Mary E. Switzer Building's target energy use was 39.5 kBTU/sqft, based on a 30 percent reduction from the ASHRAE standard. In 2015, the building's energy use was 45.8 kBTU/sqft, which was above the target.

Appendix C – Minimum Performance Criteria Audit Results by Building (cont.)

Solar Hot Water

The MPC states that for full modernizations, the buildings should have solar hot water systems installed with sufficient capacity to meet at least 30 percent of the hot water demand. This criterion does not apply to the five partial modernization projects.

Building	Project met MPC	MPC was not implemented	Project did not meet MPC	Could not be determined	MPC did not apply
Anthony J. Celebrezze Federal Building					X
John C. Kluczynski Federal Building					X
Bishop Henry Whipple Federal Building				X	
Birch Bayh U.S. Courthouse		X			
U.S. Custom House					X
Byron Rogers Federal Building				X	
Cesar E. Chavez Memorial Building					X
Denver Federal Center (Infrastructure)					X
Edith Green-Wendell Wyatt Federal Building		X			
Federal Center South Building 1202		X			
Thomas S. Foley U.S. Courthouse		X			
GSA Headquarters Building				X	
Herbert Hoover Building		X			
Lafayette Building				X	
Mary E. Switzer Building		X			
Totals	**0**	**6**	**0**	**4**	**5**

Appendix C – Minimum Performance Criteria Audit Results by Building (cont.)

See notes below for how we categorized each project's compliance with this MPC:

1. The Anthony J. Celebrezze Federal Building was a partial modernization project and this MPC did not apply.
2. The John C. Kluczynski Federal Building was a partial modernization project and this MPC did not apply.
3. The Bishop Henry Whipple Federal Building implemented a solar hot water system designed to meet 60 percent of the building's hot water demand. However, there was no way to determine the actual amount of hot water generated by the system.
4. The Birch Bayh U.S. Courthouse project did not include a solar hot water system.
5. The U.S. Custom House was a partial modernization project and this MPC did not apply.
6. The Byron Rogers Federal Building implemented a solar hot water system designed to meet 30 percent of the building's hot water demand. However, there was no way to determine the actual amount of hot water generated by the system.
7. The Cesar E. Chavez Memorial Building was a partial modernization project and this MPC did not apply.
8. The Denver Federal Center was an infrastructure modernization to replace domestic water and fire protection systems, sewer lines, a storm drainage system, and to provide upgrades to the electrical system. The MPC for solar hot water did not apply to this project.
9. The Edith Green-Wendell Wyatt Federal Building project did not include a solar hot water system.
10. The Federal Center South Building 1202 project did not include a solar hot water system.
11. The Thomas S. Foley U.S. Courthouse project did not include a solar hot water system.
12. The GSA Headquarters Building implemented a solar hot water system designed to meet 67 percent of the building's hot water demand. However, there was no way to determine the actual amount of hot water generated by the system.
13. The Herbert Hoover Building project did not include a solar hot water system.
14. The Lafayette Building implemented a solar hot water system. However, there was no way to determine the actual amount of hot water generated by the system.
15. The Mary E. Switzer Building project did not include a solar hot water system.

Appendix C – Minimum Performance Criteria Audit Results by Building (cont.)

Renewable Energy

The MPC directs project teams to plan for on-site renewable energy systems, such as photovoltaic, wind, geothermal, or solar hot water.

Building	Project met MPC	MPC was not implemented	Project did not meet MPC	Could not be determined	MPC did not apply
Anthony J. Celebrezze Federal Building		X			
John C. Kluczynski Federal Building		X			
Bishop Henry Whipple Federal Building	X				
Birch Bayh U.S. Courthouse		X			
U.S. Custom House		X			
Byron Rogers Federal Building	X				
Cesar E. Chavez Memorial Building	X				
Denver Federal Center (Infrastructure)					X
Edith Green-Wendell Wyatt Federal Building	X				
Federal Center South Building 1202	X				
Thomas S. Foley U.S. Courthouse		X			
GSA Headquarters Building	X				
Herbert Hoover Building		X			
Lafayette Building	X				
Mary E. Switzer Building	X				
Totals	**8**	**6**	**0**	**0**	**1**

Appendix C – Minimum Performance Criteria Audit Results by Building (cont.)

See notes below for how we categorized each project's compliance with this MPC:

1. The Anthony J. Celebrezze Federal Building project did not include renewable energy systems because PBS deemed such to be out of the project's scope.
2. The John C. Kluczynski Federal Building project did not include renewable energy systems because PBS deemed such to be out of the project's scope.
3. The Bishop Henry Whipple Federal Building project team implemented a photovoltaic system and geothermal heating system to meet the criterion.
4. The Birch Bayh U.S. Courthouse project did not include renewable energy systems because the project team deemed such to be out of the project's scope.
5. The U.S. Custom House project team considered photovoltaic panels, but they were not deemed to be cost effective. No other renewable energy systems were implemented.
6. The Byron Rogers Federal Building project team implemented a solar thermal system to meet the criterion.
7. The Cesar E. Chavez Memorial Building project team implemented a photovoltaic system to meet the criterion.
8. The Denver Federal Center was an infrastructure modernization to replace domestic water and fire protection systems, sewer lines, a storm drainage system, and to provide upgrades to the electrical system. The MPC for renewable energy did not apply to this project.
9. The Edith Green-Wendell Wyatt Federal Building project team implemented a photovoltaic system to meet the criterion.
10. The Federal Center South Building 1202 project implemented a geothermal ground source heat pump system to meet the criterion.
11. The Thomas S. Foley U.S. Courthouse project team considered wind generators and solar thermal systems, but did not deem these measures cost effective.
12. The GSA Headquarters Building project team implemented a photovoltaic system to meet the criterion.
13. The Herbert Hoover Building project did not include renewable energy systems because PBS deemed such to be out of the project's scope.
14. The Lafayette Building project team implemented a photovoltaic system to meet the criterion.
15. The Mary E. Switzer Building project team implemented a photovoltaic system and a geothermal heating system to meet the criterion.

Appendix C – Minimum Performance Criteria Audit Results by Building (cont.)

Indoor Water

For full modernization projects, the MPC states that buildings should reduce indoor water use by at least 20 percent compared to a standard established under the Uniform and International Plumbing Codes.[6] For partial modernization projects, the MPC states that buildings should reduce water use for fixtures by 20 percent compared to the standard or to reduce indoor potable water use by at least 20 percent from the 2007 baseline for the building. **Note:** we used the historical baselines identified by the project teams for both partial and full modernization projects. These were the numbers that were available and trackable. PBS did not track any plumbing code standard.

Building	Project met MPC	MPC was not implemented	Project did not meet MPC	Could not be determined	MPC did not apply
Anthony J. Celebrezze Federal Building	X				
John C. Kluczynski Federal Building	X				
Bishop Henry Whipple Federal Building	X				
Birch Bayh U.S. Courthouse	X				
U.S. Custom House	X				
Byron Rogers Federal Building	X				
Cesar E. Chavez Memorial Building	X				
Denver Federal Center (Infrastructure)					X
Edith Green-Wendell Wyatt Federal Building	X				
Federal Center South Building 1202	X				
Thomas S. Foley U.S. Courthouse	X				
GSA Headquarters Building			X		
Herbert Hoover Building				X	
Lafayette Building				X	
Mary E. Switzer Building	X				
Totals	**11**	**0**	**1**	**2**	**1**

[6] The MPC references plumbing code standards based on the Energy Policy Act of 1992, the 2006 Uniform Plumbing Code, and the 2006 International Plumbing Code.

Appendix C – Minimum Performance Criteria Audit Results by Building (cont.)

See notes below for how we categorized each project's compliance with this MPC:

1. The Anthony J. Celebrezze Federal Building was a façade project and indoor water reduction was not part of the project's scope; however, the building did achieve a 37 percent reduction from the 2007 baseline.
2. The John C. Kluczynski Federal Building achieved a 40 percent reduction from the 2009 baseline.
3. The Bishop Henry Whipple Federal Building achieved a 57 percent reduction from the 2009 baseline.
4. The Birch Bayh U.S. Courthouse achieved a 44 percent reduction from the average of the 2007-2008 baselines.
5. The U.S. Custom House achieved a 48 percent reduction from the 2007 baseline.
6. The Byron Rogers Federal Building achieved a 36 percent reduction from the 2007 baseline.
7. The Cesar E. Chavez Memorial Building achieved a 34 percent reduction from the 2007 baseline.
8. The Denver Federal Center was an infrastructure modernization to replace domestic water and fire protection systems, sewer lines, a storm drainage system, and to provide upgrades to the electrical system. The MPC for indoor water did not apply to this project.
9. The Edith Green-Wendell Wyatt Federal Building achieved a 66 percent reduction from the 2007 baseline.
10. The Federal Center South Building 1202 achieved full LEED credit for indoor water reduction. Without a way to compare building performance to a baseline, we determined that the LEED credit was sufficient.
11. The Thomas S. Foley U.S. Courthouse achieved a 39 percent reduction from the 2009 baseline.
12. The GSA Headquarters Building is a multi-phased project that is not complete. However, overall water use in the building actually increased since 2007-2008. PBS officials believe that new chillers in the new central air conditioning plant are the cause of the increase in water use.
13. The Herbert Hoover Building is a delegated building, and PBS did not have access to water use statistics.
14. The Lafayette Building project team stated that water use could not be evaluated until all phases of the project are complete and the building is fully occupied. As a result, we could not determine if this MPC was met at the time of our testing. Subsequently, PBS provided 2017 data showing the building achieved a 60 percent reduction from the 2007 baseline.
15. The Mary E. Switzer Building achieved a 30 percent reduction from the 2007 baseline.

Appendix C – Minimum Performance Criteria Audit Results by Building (cont.)

Outdoor Water

The MPC for full and partial modernizations requires PBS to reduce outdoor water use for irrigation by 50 percent compared to a 2007 baseline.

Building	Project met MPC	MPC was not implemented	Project did not meet MPC	Could not be determined	MPC did not apply
Anthony J. Celebrezze Federal Building					X
John C. Kluczynski Federal Building					X
Bishop Henry Whipple Federal Building				X	
Birch Bayh U.S. Courthouse	X				
U.S. Custom House					X
Byron Rogers Federal Building					X
Cesar E. Chavez Memorial Building			X		
Denver Federal Center (Infrastructure)					X
Edith Green-Wendell Wyatt Federal Building	X				
Federal Center South Building 1202	X				
Thomas S. Foley U.S. Courthouse					X
GSA Headquarters Building					X
Herbert Hoover Building					X
Lafayette Building					X
Mary E. Switzer Building	X				
Totals	**4**	**0**	**1**	**1**	**9**

See notes below for how we categorized each project's compliance with this MPC:

1. The Anthony J. Celebrezze Federal Building was a façade project that did not include outdoor water reduction in its scope.
2. The John C. Kluczynski Federal Building project did not have enough outdoor landscaping to address the criterion.
3. The Bishop Henry Whipple Federal Building project team implemented outdoor water saving measures, but because indoor and outdoor water are not metered separately, we could not determine if the building met the criterion.
4. The Birch Bayh U.S. Courthouse achieved outdoor water savings of 69 percent, according to a LEED scorecard. We could not determine how the savings were calculated, but we considered the project to have met the criterion, based on the LEED scorecard.
5. The U.S. Custom House project did not have enough outdoor landscaping to address the criterion.
6. The Byron Rogers Federal Building project did not have enough outdoor landscaping to address the criterion.
7. The Cesar E. Chavez Memorial Building achieved outdoor water savings of only 30 percent, according to a LEED scorecard. We could not determine how the savings were calculated, but we considered the project to have fallen short of the 50 percent criterion, based on the LEED scorecard.
8. The Denver Federal Center was an infrastructure modernization to replace domestic water and fire protection systems, sewer lines, a storm drainage system, and to provide upgrades to the electrical system. The MPC for outdoor water did not apply to this project.
9. The Edith Green-Wendell Wyatt Federal Building achieved outdoor water savings of 58 percent, according to a LEED scorecard. We could not determine how the savings were calculated, but we considered the project to have met the criterion, based on the LEED scorecard.
10. The Federal Center South Building 1202 project included sustainable "xeriscaping" planting and achieved LEED credit.[7]
11. The Thomas S. Foley U.S. Courthouse project did not have enough outdoor landscaping to address the criterion.
12. The GSA Headquarters Building project did not have enough outdoor landscaping to address the criterion.
13. The Herbert Hoover Building project did not have enough outdoor landscaping to address the criterion.
14. The Lafayette Building project did not include outdoor water reduction as part of the Recovery Act phase of the project. Outdoor water reduction measures will be implemented in a future project phase.
15. The Mary E. Switzer Building project removed all outside irrigation.

[7] "Xeriscaping" is the practice of designing landscapes to reduce or eliminate the need for irrigation.

Appendix C – Minimum Performance Criteria Audit Results by Building (cont.)

Bio-Based Content

The MPC for all Recovery Act buildings relative to bio-based content is to use products with bio-based content according to the U.S. Department of Agriculture's Bio-Preferred Program and made from rapidly renewable resources and certified sustainable wood products. The criterion does not specify a threshold, such as the percentage of products with bio-based content that must be used in the projects.

Building	Project met MPC	MPC was not implemented	Project did not meet MPC	Could not be determined	MPC did not apply
Anthony J. Celebrezze Federal Building		X			
John C. Kluczynski Federal Building	X				
Bishop Henry Whipple Federal Building		X			
Birch Bayh U.S. Courthouse		X			
U.S. Custom House		X			
Byron Rogers Federal Building	X				
Cesar E. Chavez Memorial Building	X				
Denver Federal Center (Infrastructure)					X
Edith Green-Wendell Wyatt Federal Building	X				
Federal Center South Building 1202	X				
Thomas S. Foley U.S. Courthouse		X			
GSA Headquarters Building				X	
Herbert Hoover Building	X				
Lafayette Building	X				
Mary E. Switzer Building	X				
Totals	**8**	**5**	**0**	**1**	**1**

Appendix C – Minimum Performance Criteria Audit Results by Building (cont.)

See notes below for how we categorized each project's compliance with this MPC:

1. The Anthony J. Celebrezze Federal Building project team could not find opportunities to use bio-based content on the façade project.
2. The John C. Kluczynski Federal Building project team documented its use of bio-based content.
3. The Bishop Henry Whipple Federal Building project did not include bio-based content.
4. The Birch Bayh U.S. Courthouse project design, which pre-dated the Recovery Act, did not include bio-based content.
5. The U.S. Custom House project team deemed bio-based content use impractical for the project.
6. The Byron Rogers Federal Building project team documented its use of bio-based content.
7. The Cesar E. Chavez Memorial Building project team documented its use of bio-based content.
8. The Denver Federal Center was an infrastructure modernization to replace domestic water and fire protection systems, sewer lines, a storm drainage system, and to provide upgrades to the electrical system. The MPC for bio-based content did not apply to this project.
9. The Edith Green-Wendell Wyatt Federal Building project team documented its use of bio-based content.
10. The Federal Center South Building 1202 project team documented its use of bio-based content.
11. The Thomas S. Foley U.S. Courthouse project team did not incorporate the use of bio-based content.
12. The GSA Headquarters Building project team did not know if bio-based content was used on the project.
13. The Herbert Hoover Building project team and contractor did not know if bio-based content was used on the project. However, subsequent to our draft report, PBS provided documentation showing that the project implemented bio-based content.
14. The Lafayette Building project team documented its use of bio-based content.
15. The Mary E. Switzer Building project team documented its use of bio-based content.

Appendix C – Minimum Performance Criteria Audit Results by Building (cont.)

Waste and Materials

The MPC for all Recovery Act projects relative to waste and materials is to salvage, recycle, or reuse at least 50 percent of construction and demolition waste generated on the project.

Building	Project met MPC	MPC was not implemented	Project did not meet MPC	Could not be determined	MPC did not apply
Anthony J. Celebrezze Federal Building		X			
John C. Kluczynski Federal Building	X				
Bishop Henry Whipple Federal Building	X				
Birch Bayh U.S. Courthouse	X				
U.S. Custom House			X		
Byron Rogers Federal Building	X				
Cesar E. Chavez Memorial Building	X				
Denver Federal Center (Infrastructure)	X				
Edith Green-Wendell Wyatt Federal Building	X				
Federal Center South Building 1202	X				
Thomas S. Foley U.S. Courthouse	X				
GSA Headquarters Building				X	
Herbert Hoover Building	X				
Lafayette Building	X				
Mary E. Switzer Building	X				
Totals	**12**	**1**	**1**	**1**	**0**

Appendix C – Minimum Performance Criteria Audit Results by Building (cont.)

See notes below for how we categorized each project's compliance with this MPC:

1. The Anthony J. Celebrezze Federal Building project team abandoned plans to meet the criterion once it determined that LEED certification would not be met. The project had no data for the tracking of waste materials recycling.
2. The John C. Kluczynski Federal Building project met the criterion with a 94.5 percent recycling rate.
3. The Bishop Henry Whipple Federal Building the project met the criterion with a recycling rate in excess of 75 percent.
4. The Birch Bayh U.S. Courthouse project met the criterion with a recycling rate in excess of 75 percent.
5. The U.S. Custom House project did not meet the criterion with a 31 percent recycling rate.
6. The Byron Rogers Federal Building project met the criterion with a 52 percent recycling rate.
7. The Cesar E. Chavez Memorial Building project met the criterion with a 91 percent recycling rate.
8. The Denver Federal Center project met the criterion with an 88 percent recycling rate.
9. The Edith Green-Wendell Wyatt Federal Building project met the criterion with an 87 percent recycling rate.
10. The Federal Center South Building 1202 project met the criterion with a nearly 100 percent recycling rate.
11. The Thomas S. Foley U.S. Courthouse project team met the criterion with a 92 percent recycling rate.
12. The GSA Headquarters Building project team did not have information on recycling rates.
13. The Herbert Hoover Building project met the criterion with an 82 percent recycling rate.
14. The Lafayette Building project met the criterion with a 93 percent recycling rate.
15. The Mary E. Switzer Building project met the criterion with a 78 percent recycling rate.

Appendix D – GSA Comments

GSA

Public Buildings Service

JULY xx, 2018

MEMORANDUM FOR MARISA A. ROINESTAD
Associate Deputy Assistant Inspector General for Auditing
Real Property and Finance Audit Office (JA-R)

FROM: DANIEL W. MATHEWS
Commissioner
Public Buildings Service (P)

SUBJECT: Draft Report - *Audit of PBS's American Recovery and Reinvestment Act Sustainability Results*, A150026

This memorandum is in response to the Draft Audit Report entitled *Audit of PBS's American Recovery and Reinvestment Act Sustainability Results (A150026)*, dated June 21, 2018.
The report identified three recommendations:

1. Ensure that senior management provides oversight of the implementation of the minimum performance criteria in future capital projects, including documenting approval to waive these criteria.
2. Review Recovery Act projects and implement building improvements needed to meet the minimum performance criteria.
3. Assess results of implemented high-performance green building measures in future capital projects by:
    a. Using appropriate and consistent baselines for energy and water use;
    b. Gathering necessary data and information from contractors and delegated agencies to gauge compliance with criteria; and
    c. Ensuring methods are in place to compare actual building performance against all minimum performance criteria.

The following is PBS's response to this report:

Recommendation 1: Ensure management oversight of minimum performance criteria (MPC) implementation in future capital projects, including documenting any approval to waive these criteria.

PBS agrees with this recommendation. In 2018, PBS will consolidate its oversight of high-performance building MPCs, now known as Guiding Principles Criteria (GPCs), into its *P100 Facilities Standards* (P100) waiver process. Waiver/inapplicability requests will be evaluated by Technical Committees and management with decisions documented in GSA's *Green Building Upgrade Information Lifecycle Database* (gBUILD).

PBS does not agree with the finding that it had ineffective management control and oversight of MPC implementation during the American Recovery and Reinvestment Act of 2009 (Recovery). PBS created its MPC checklist as a framework to oversee and document Recovery projects' compliance with environmental mandates including the cross-government *Guiding Principles for Sustainable Federal Buildings*. Regional Recovery Executives and Recovery technical teams repeatedly consulted on the project-specific feasibility and applicability of each MPC. Management controls were in place throughout Recovery projects' 2009-2015 delivery lifecycles. PBS agrees that its methodology for tracking sustainability progress, including MPC compliance, has evolved since the checklist's inception in 2009. Attachment 1 lists PBS's MPC/GPC oversight processes.

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Recommendation 2: Review Recovery Act projects and implement improvements to meet the MPCs.

PBS agrees with the recommendation to continue reviewing Recovery buildings' performance, to identify ways to optimize efficiency within available resources—such as through "Light-Touch Measurement & Verification" reviews, operational oversight, and onsite post-occupancy evaluations. As funds are made available for capital improvement and new construction programs, PBS continues to apply sustainable building practices, incorporating as many improvements as can be funded, and which are cost-effective, within each project's budget. Of PBS's owned and leased buildings that are 5,000 gross square feet or larger, over 20% meet the Guiding Principles, compared to a 15% goal. PBS's Recovery projects and its MPCs helped GSA achieve more Guiding Principles-compliant building space than any other agency.

PBS does not agree with the finding that reviewed projects "met only 50 of the 87 applicable minimum performance criteria" that were tested. It is not necessary, nor always appropriate, to meet every MPC at every project, due to varied scopes and locations. In accordance with the Recovery Act, Executive Order 13514, and PBS policies, Recovery projects pursued all MPCs that PBS management found to be feasible, cost-effective, and/or necessary. Attachment 1 lists the manual and electronic processes used to validate and document which criteria applied or did not apply to each Recovery project. The attachment also addresses project-specific MPC findings regarding Energy Efficiency, Renewable Energy, Indoor Water, and Bio-Based Content.

Recommendation 3a: Use appropriate and consistent energy/water baselines.

PBS agrees with the recommendation to validate the baseline methodology selected by each project team, and to model similar situations consistently. Baselines for Recovery Act Projects were set using the methodology that best fit the conditions of the individual projects. Multiple years of actual performance data were averaged in some cases where single-year baselines would be inaccurate, such as previously vacant buildings. Attachment 1 explains the limited predictive value of modeled baselines and targets.

Since 2015, PBS has used its "Regional Approval Process for gBUILD Data" to review capital projects' reported baselines, scope details, and performance goals, including LEED (Leadership in Energy and Environmental Design) Certification. Management decisions are logged in gBUILD. Attachment 2 contains multiple documents, including a Guiding Principles checklist and the Regional Approval Process for gBUILD Data.

Recommendation 3b: Gather compliance data from contractors and delegated agencies.

PBS agrees with this recommendation. PBS will continue to gather compliance data from contractors and delegated agencies, ensure timely and complete responses, and use this material to help validate MPC compliance. Attachment 1 explains what data is obtained, and addresses a finding about utility bill data.

Recommendation 3c: Ensure methods are in place to compare actual performance against all MPCs.

PBS agrees with the recommendation as it regards the importance of monitoring actual performance against MPCs where cost-effective. The PBS Office of Facilities Management continually tracks operating outcomes as part of its performance oversight of the entire PBS portfolio, including Recovery Act buildings. The PBS Recovery program projects are outperforming overall energy savings goals. Affected facilities are using 19% less energy per gross square foot, and are saving over $60 million in annual utility costs, compared to a pre-project 2008 baseline. Over 20 years, PBS estimates $1.5 billion in saved utility costs. PBS Recovery investments also resolved a sizable $1.4 billion of the repair and alteration backlog, as necessary for long-term stewardship of a diverse portfolio.

PBS does not agree with the specific recommendation to submeter solar water heating systems or outdoor water usage. That was not required by the Recovery Act, the Energy Independence and Security Act of 2007 (EISA), the 2008 Guiding Principles, or the MPCs. PBS policy does not require such a step. In addition, it is typically not cost-effective to separately "submeter" smaller systems like solar thermal

water heaters or irrigation systems. PBS has submetered many of its portfolio's larger systems, where the additional investment needed to install and monitor submeters yields more value. PBS disagrees with certain project-specific findings. Attachment 1 explains why some Solar Hot Water and Outdoor Water MPCs were either met or inapplicable.

Thank you for the opportunity to comment on this report. Should you have any questions, please contact Assistant Commissioner Laura Stagner at (202) 969-4071.

Attachments (2)
Attachment 1 - Technical Comments Responding to Specific Audit Findings
Attachment 2 - Guiding Principles Checklist, Sustainability Exemption Oversight Process, Regional Approval Process for gBUILD Data, and Hoover Building Utility Data Transmittal

Appendix E – Report Distribution

GSA Administrator (A)

Commissioner (P)

Deputy Commissioner (P)

Chief of Staff (P)

Regional Administrator (5A, 8A, 10A, WA)

Regional Commissioner (5P, 8P, 10P, WP)

Assistant Commissioner for Project Delivery (PCB)

Chief Administrative Services Officer (H)

Audit Management Division (H1EB)

Assistant Inspector General for Auditing (JA)

Director, Audit Planning, Policy, and Operations Staff (JAO)