ATTACHMENT 1

HANFORD SITE 2017
GENERAL PURPOSE FACILITIES MASTER PLAN
VOLUME 1

Consisting of 96 pages,
including this cover page
Hanford Site 2017 General Purpose Facilities Master Plan – Volume 1

MDC414

Current Facility Condition

<table>
<thead>
<tr>
<th>Life Cycle</th>
<th>Description of Condition</th>
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HNF-61280

September 2017
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OWNER’S SUMMARY

General Purpose Facilities Strategic Approach

The Hanford Site (Site) is an area of land owned by U.S. Department of Energy (DOE). The Site covers ~580 square miles of southeastern Washington State, along the Columbia River (Figure OS-1). The DOE Richland Operations Office (RL) and the DOE Office of River Protection (ORP), under management authority and responsibility of the DOE Office of Environmental Management, are implementing extensive activities to eliminate excess facilities, cleanup contamination, disposition waste, and perform environmental restoration to effected land on the Site resulting from past plutonium production programs.

The Site’s cleanup mission is supported by various infrastructure systems crucial to its success. The general purpose buildings and trailers are part of the larger system of facilities that supports the Site cleanup mission and the other infrastructure systems. The general purpose facilities (GPFs) are offices, shops, and warehouse and storage facilities available to provide space uses that are more general in nature (as opposed to programmatic facilities designated to support a specific mission element). GPFs can be potentially reassigned to support multiple projects or prime contractors. For this reason, planning for GPFs as a system is needed for the Site’s success.

This owner’s summary provides a strategic view of how RL envisions the GPFs will be managed and maintained to meet the evolving needs of the cleanup mission which is anticipated to continue until 2050. This Hanford Site 2017 General Purpose Facilities Master Plan (Plan) is unique and differs from the other infrastructure master plans because the three prime contractors are each responsible for their respective GPFs (each of the other infrastructure master plans is developed by the organization that is responsible for the entire associated infrastructure system).
General Purpose Facilities Strategic Objective

The GPFs are assigned to each prime contractor supporting DOE’s cleanup mission: CH2M Hill Plateau Remediation Company (CHPRC) supporting the Plateau Remediation Cleanup Program, and Mission Support Alliance, LLC (MSA) supporting the Site’s Central Services Program; and Washington River Protection Solutions, LLC (WRPS) supporting the Tank Operations Contractor (TOC) Program. Each prime contractor has responsibility for its GPFs, and MSA has the additional responsibility for Sitewide planning for the GPFs and the development of this Plan, in addition to MSA controlled facilities.

This Plan, building on the previous *2012 Facilities Master Plan*, HNF-53496, identifies current GPFs of all three prime contractors, describes their respective requirements, and defines a management process to integrate their requirements. The management process identified in this Plan is designed to support contractors sharing facility information between contractors. The process will be flexible and integrative plus adaptive, since each prime contractor facilities are planned through distinct planning processes driven by separate contracts from two DOE offices (RL and ORP). MSA developed an array of facility management tools described in this Plan that are designed to integrate DOE Contractor facility awareness and participation. These tools share facility information with applications and datasets open to contractor access. Prime contractors are encouraged to use the tools to manage their company facility assets in a common data architecture.

The strategic objectives for this Plan are to:

- Identify the current facilities categorized as general purpose office, shop, warehouse, and storage facilities.
- Provide planning analysis results to identify needs and efficiencies.
- Support integrating GPF planning analyses into the *Infrastructure and Services Alignment Plan* (HNF-44238) and other master plans.
- Identify ways to continue improving the process for managing the GPFs in the most cost-effective and efficient manner.

This Plan documents the planning process and describes the tools used in the process. Key process-generated planning project strategies are to:

- Support integration with current and future prime contractors (who may have GPF responsibility).
- Maintain an up-to-date and accurate GPF list.
- Provide timely and accurate information to make decisions and report performance metrics.
• Identify potential facility challenges and opportunities.
• Provide recommendations for improvements.

The data presented in this Plan were obtained and reviewed by all three prime contractors. Based on the analyses described in this Plan, recommendations promote an enhanced facility management process that provides efficient operations and projects, and help to reduce costs and deficiencies.

This Plan evaluates supply versus demand of current GPFs to identify space shortfalls and surpluses. The supply of GPF space is calculated based on the life of the facilities with the program missions that each supports. The supply of GPF demand is calculated as being proportional to outyear budget projections. The GPF space demand is calculated from current out year budget projections to estimate the amount of required space.

**Current State of General Purpose Facilities**

Active facilities on the Site are classified into three categories: 1) GPFs, 2) general purpose dedicated facilities, and 3) programmatic facilities. The scope of this Plan addresses only GPFs. Facilities that are inactive and currently awaiting demolition were excluded from consideration in this Plan, as well as radiological controlled buildings and buildings smaller than 500 square feet.

A total of 1,369 active operational and inactive facilities (buildings and trailers) support the Site mission as of September 2017. Two-hundred ninety-two facilities are GPFs, with a total area of 2,241,028 square feet. The text box lists how these facilities are categorized by facility type. ¹ Forty-five of these facilities are leased and the remaining are government owned.

The lifecycle reliability of DOE-owned facilities is moderate to low, since many facilities are well beyond their end of life, and many have roofs and heating, ventilation, and air conditioning (HVAC) issues.

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¹ In this report, three facilities are counted more than once because they are being used by different organizations or for different primary purposes: 825 Jadwin is used by DOE, CHPRC, and MSA and is counted three times; 2101M is used as a warehouse, a shop, and an office and is counted three times; and 1979 Snyder is used by MSA and HPM Corporation and is counted twice. If these facilities are counted only once, then the total facility count would be 1,364 unique buildings.
systems that have performed beyond their design life.

Establishing a planning process that will address GPFs is challenging; responsibility for the facilities lies with all three prime contractors, each with their own internal facility management process. MSA in collaboration with the other prime contractors, has established the Joint Contractor Space Utilization Board (JCSUB) comprised of representatives from DOE and Site prime contractors with GPF responsibility to meet this unique challenge. The JCSUB reviews current and future Site GPF needs. The JCSUB members collaborate to support optimization of the current inventory of facilities and space across the Site to meet the current and future Site mission requirements. A key aspect to the success of this Plan is to continue building on this process and develop a flexible approach that can be adapted to meet ever-changing needs of the prime contractors. Improvement and use of the existing tracking and evaluating tools will help improve the process. Improvement and use of the existing tracking and evaluating tools will help improve the process, identify potential gaps and shortfalls, and initiate actions to more efficiently use the GPFs.

The Future State of General Purpose Facilities

Aligning management of the GPFs with the Site’s cleanup mission is critical to ensure that facilities are available to meet mission needs. Major cleanup projects conducted for RL are shown in the cleanup timeline in Figure OS-2. In Figure OS-2, the dark blue lines represent performance of removal actions for the major canyon facilities. The light blue lines represent remedial actions assigned to each area listed, along with ancillary buildings and the Subsequent Unit for Individual Development (cleanup zones on the Central Plateau) closures.

The ORP is in the final stages of developing the River Protection Project System Plan (System Plan), Revision 8, to provide a baseline for executing the mission to retrieve and treat Site tank waste and close the tank farms to protect the Columbia River. The System Plan is anticipated to
be released in first quarter FY2018 and will provide an updated baseline that can be used to help plan for the need for GPFs to support that project.  

The RL Lifecycle Baseline Schedule and the ORP System Plan are two key planning documents that will be used to derive the need for GPFs. The demand for future GPFs is determined by space requirements to support the cleanup projects. The published baseline cost and schedule estimates can be used to determine the timeline that significant cleanup activities are scheduled to be performed and help to identify the timing of the need for GPF space. As the RL baseline is refined and the River Protection Project System Plan is released, the schedule requirements can be incorporated into the GPF planning process to help provide adequate available space to support the cleanup mission.

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2 The River Protection Project System Plan, Revision 8, was not available at the time of this Plan’s publication.
EXECUTIVE SUMMARY

The U.S. Department of Energy (DOE), Richland Operations Office (RL) and the Office of River Protection (ORP) are responsible for the Hanford Site (Site) cleanup mission. Various infrastructure systems are required to support this cleanup mission. General purpose facilities (GPFs) are part of the larger system of facilities that provide critical support to the cleanup mission. The facilities system is unique among the Site infrastructure systems because responsibility for the facilities is divided between the three prime contractors on the Site (other Site infrastructure systems are managed by one contractor). Effective planning for these facilities is essential to maintaining their effectiveness. Over 52% of the GPFs are more than 20 years old, and many are trailers that were designed for more temporary support. Some facilities are past their design life, and many will reach their design life before the end of their mission and will require significant maintenance and repairs to support continued Site operation. This Hanford Site 2017 General Purpose Facilities Master Plan (Plan) defines which facilities currently fall into the GPF category, describes their current state and estimates the demand for GPF space in the future.

The data presented in this Plan were developed in collaboration with the other prime contractors (CH2M Hill Plateau Remediation Company [CHPRC], Mission Support Alliance, LLC [MSA], and Washington River Protection Solutions, LLC [WRPS]) and their respective facility subject matter experts. The GPF list addressed in this Plan was developed from Site facility management databases (Facilities Information Management System and CareTaker) and supplemented by the subject matter experts from the three prime contractors to generate an accurate list.

Strategic Planning

Strategic planning for the GPFs must be aligned with the strategic plans for the overall Site cleanup mission. The objective of this Plan and Site GPF management is to promote efficient operations and projects, and lead to reduced costs and reduced deficiencies, while supporting completion of the cleanup mission. This Plan helps to address longstanding and emerging issues regarding GPFs that affect efficient Site operations.

To provide an integrated analysis to define the need for GPFs through 2050, this Plan incorporates the requirements for the three contactors supporting RL and ORP. The analysis is performed for the three types of GPFs: 1) offices, 2) shops, and 3) warehouse and storage space.
Forecasted Need

This Plan’s analytical results are based on projecting out the future supply of GPFs and comparing that supply to a future demand of GPFs. Currently, 292 facilities are classified as Site GPFs. The disposition date for each facility was used to forecast the supply through 2050. The considerations for the demand of each GPF type are discussed.

Office

The integrated analysis shows a growing demand for office space beginning in 2018, resulting in a shortfall. In addition, without significant investment, the facilities that are rapidly approaching the end of their lifecycles will negatively impact the supply of facilities. Detailed forecasted demand estimates were developed for GPF office space, assuming the demand is proportional to the lifecycle cost planning profile. GPF office space comprises ~80% of GPF space and thus, represents the greatest opportunity for increased efficiencies.

Shops

Future shop space demand was difficult to determine because of the unique nature of shops; shops generally are dedicated for a specific purpose. Therefore, the master plans and the Infrastructure and Services Alignment Plan (HNF-44238, Revision 8) documents were reviewed to identify GPF shop requirements. The Fleet Services Facilities Master Plan (HNF-60164) indicates that a new fleet complex is planned for the 200 East Area to support the remainder of the cleanup mission during the next 45 years. A cost benefit analysis is currently being completed (HNF-61233, finalized in September 2017) looking at vehicle maintenance shop modifications. The initial analysis identifies two new shops plus one

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3 In this report, three facilities are counted more than once because they are being used by different organizations or for different primary purposes: 825 Jadwin is used by DOE, CHPRC, and MSA and is counted three times; 2101M is used as a warehouse, a shop, and an office and is counted three times; and 1979 Snyder is used by MSA and HPM Corporation and is counted twice. If these facilities are counted only once, then the total GPF count would be 287 unique buildings.
remodeled facility funded during the next 8 years that will cost effectively meet fleet shop needs by providing safe, compliant, sustainable, and reliable space.

**Warehouse and Storage**

The analyses for warehouse and storage facilities were conducted in collaboration with the other Site contractors. By reviewing the existing inventory and dispositioning materials that have not been identified for future use, it is anticipated that current warehouse space will continue to be sufficient for ongoing activities in the near future. However, demand is anticipated to increase to support the construction and operations of the Waste Treatment and Immobilization Plant (WTP). Coordination between RL and ORP will be required to provide sufficient available space.

Fourteen GPF storage facilities comprise 76,604 square feet. This Plan includes several projected needs identified by the Site prime contractors regarding storage space. However, the long-term demand for GPF storage space is difficult to accurately estimate; storage space requirements are dependent on specific project needs and many future projects remain in the planning phase.

**Facility Management Process**

The Sitewide facility management process centralizes GPF facility and space planning activities available for all contractors. The process is comprised of a structured business forum that defines how the activities are conducted, how the facility information systems are used to capture and share key facility information, and the Joint Contractor Site Utilization Board (JCSUB) that oversees the facility management activities. The process includes access to several facility information automated tools created to facilitate space optimization used across the Site. The Facility Lifecycle Data Model (FLDM) is one of the primary tools utilizing predictive lifecycle forecasts based on industry information to estimate facility lifecycles. Focused on the type of structure and the type of major subsystems (heating, ventilation, and air conditioning [HVAC] systems, and roof systems) the lifecycle model is an effective tool to forecast when major facility upgrades may be required before failure. Another effective tool that has been developed is the Hanford Facility Availability Listing (HFAL) which acts as a “multiple-listing service” for Site contractors to advertise space needed and available. Figure ES-1 shows an HFAL home page screenshot and an FLDM dashboard snapshot.
Figure ES-1. Screenshots of Facility Planning Tool Dashboards.

The two facility management tools provide users with facility and major subsystem information at a quick glance. The tools are designed to provide key information necessary for high level planning purposes shared among DOE contractors.

Conclusions and Recommendations

The 292 facilities that comprise the GPFs serve as a key resource to support the Site cleanup mission. These facilities serve specific purposes and are currently fully used to meet the Site prime contractor needs.

Office space presents the biggest challenge for GPF planning. There is a growing gap between supply and demand for office space primarily in the 200 East Area that will require immediate attention. The analyses reveal an increasing demand for office space in the next 10 years. This growing demand is illustrated in Figure ES-2.

In addition to the gap in office space, many of these aging facilities will require significant investment of their structures, HVAC systems, and/or roof systems for continued operations to meet their mission life requirements. Without significant investment in these facilities, it will be progressively difficult to address the facility gaps. Facilities and their respective systems will begin to fail at an increasing rate, thereby creating potential impacts to program operations occupying GPF space.

Each prime contractor is responsible for managing their respective GPFs, but one contractor (the Mission Support Contractor) is responsible for establishing the management process. The JCSUB, established in 2014, provides a forum attended by the three major contractors for sharing facility and space planning information. As GPF and space planning becomes more
critical, integrated contractor participation in the JCSUB will produce greater benefits for the Site.

Figure ES-2. Gap in Supply of Office Space to Achieve 90% Maximum Utilization Target.

The primary recommendations in this Plan supported by Figure ES-1 can be grouped into three main areas:

1. Support the development of a new project to address the gap of 200,000 to 300,000 square feet in the supply of future office space for several years, and gaps above 50,000 square feet in additional years. This would involve developing an analysis of the demand at a geographic level to identify areas where new facilities would be optimally needed as well as an overall strategy to meet the demand. The analysis would determine the size and location of a permanent facility(ies) (determined by an average need) and a strategy to meet the peak demands (possibly leased space or trailers) where it exceeds the average demand. This would be followed by a cost benefit analysis, as part of the project definition and justification for new GPF office facilities, to address gaps identified in this Plan.

2. Enhance the GPF management process to actively manage the GPF list; institutionalize the role of the JCSUB in the GPF planning process; and integrate an annual supply and demand analysis into the GPF planning process. Expand the role of the JCSUB to take on a more long-range planning for GPFs. In addition, develop a communication plan to promote the use of training for using the tools.

3. Institutionalize the use of the FLDM to support GPF lifecycle planning decisions focusing on the facility, roof, and HVAC replacements. Prioritize maintenance and replacement activities by considering the remaining years needed to support mission
needs and the facility’s position on the lifecycle degradation curve, in addition to current facility condition.

The 2012 Facilities Master Plan, HNF-53496, introduced a concept of predicting facility condition based on typical lifecycles of structures and systems. This Hanford Site 2017 General Purpose Facilities Master Plan updates and expands the 2012 Facilities Master Plan, the process and tools developed therein, provides a strategic outlook for forecasting facility shortfalls, and presents recommendations for potential use and integration opportunities to meet Site cleanup mission requirements.
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### TERMS

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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<td>BNI</td>
<td>Bechtel National, Inc.</td>
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<tr>
<td>CHPRC</td>
<td>CH2M Hill Plateau Remediation Company, LLC</td>
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<td>D&amp;D</td>
<td>decommissioning and demolition</td>
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<td>DOE</td>
<td>U.S. Department of Energy</td>
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<tr>
<td>FIMS</td>
<td>Facilities Information Management System</td>
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<td>Facility Lifecycle Data Model</td>
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<td>GPF</td>
<td>general purpose facility</td>
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<td>U.S. General Services Administration</td>
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<td>HPM Corporation</td>
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<td>heating, ventilation, and air conditioning</td>
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<td>ISAP</td>
<td>Infrastructure and Services Alignment Plan</td>
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<td>Joint Contractor Space Utilization Board</td>
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<td>RL</td>
<td>U.S. Department of Energy, Richland, Washington, Office</td>
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<td>TOC</td>
<td>Tank Operations Contract</td>
</tr>
<tr>
<td>WRPS</td>
<td>Washington River Protection Solutions, LLC</td>
</tr>
<tr>
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<td>Waste Treatment and Immobilization Plant</td>
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1. INTRODUCTION

The Hanford Site (Site) covers an area of ~580 square miles in southeastern Washington State along the Columbia River (Figure 1-1). The Site played a pivotal role in our nation’s defense beginning in the 1940s when the Site was established under the Manhattan Project as a major plutonium production complex. The Site is one of the world’s largest and most complex environmental cleanup missions designed to address the 40-year legacy of the Manhattan Project, with many challenges to be resolved in the face of overlapping and sometimes conflicting technical, political, regulatory, and cultural interests.

The Site cleanup mission is supported by various infrastructure systems that are crucial to its success. The Site’s buildings and trailers are part of a facility system that supports the Site cleanup mission and the other infrastructure systems. For this reason, planning for facilities as a system is needed to support the success of the Site cleanup mission. This Hanford Site 2017 General Purpose Facilities Master Plan (Plan) describes the current state and the anticipated future needs of the Site facility system.

The Site cleanup is managed by two U.S. Department of Energy (DOE) field offices. The U.S. Department of Energy, Richland Operations Office (RL) is responsible for completing nuclear waste and facility cleanup and overall Site management. The DOE Office of River Protection (ORP) is responsible for Site tank waste cleanup, which includes Waste Treatment and Immobilization Plant (WTP) construction and operation. Both projects are involved with safely and effectively processing highly radioactive waste materials.

Site cleanup and management responsibilities under the two DOE offices are assigned to three separate prime contracts. The Plateau Remediation Contract (PRC) and the Mission Support Contract (MSC) are managed by RL. The PRC encompasses the majority of the cleanup activities on the Central Plateau and along the Columbia River Corridor, including groundwater...
and vadose zone remediation, and facilities and canyons demolition. This work scope is being performed by CH2M Hill Plateau Remediation Company (CHPRC). The MSC is responsible for providing integrated infrastructure services for the Site cleanup mission, including facility and land management services, to support the Site cleanup mission. Mission Support Alliance, LLC (MSA), performs this scope of work.

The Tank Operations Contract (TOC) is managed by ORP. The Tank Operations Contract (TOC) is responsible for the managing the Site’s single-shell tanks and double-shell tanks. Washington River Protection Solutions, LLC (WRPS), currently holds the TOC.

Acquisition activities have begun for the follow-on prime contract(s). Therefore, it is not yet known if the work will be similarly aligned under separate contracts. For the purposes of this Plan, the work scope will assume to be attributed to the current contract alignment (PRC, MSC, and TOC). The responsibility and delineation of existing facilities will be attributed to the three prime contractors (CHRPC, MSA and WRPS) currently performing the scope of work for reporting current use and statistics, while the responsibility and delineation of facilities in the future will be attributed to the corresponding contract scope (PRC, MSC, and TOC).

1.1 Background

Facility master plans have been used to identify facility projects and upgrades required to extend Site facility lifespans and to meet emergent Site operational needs. These facility master plans have been produced and updated on a 5-to-7-year cycle for more than 20 years. The previous version was published in 2012 (Facilities Master Plan, HNF-53496), and introduced a concept of predicting facility condition based on typical lifecycles of structures and systems. This 2017 Plan builds on the results of the 2012 facility master plan’s analytical methods and results.

This Plan provides a strategic outlook for forecasting facility shortfalls and identifies potential use and integration opportunities to meet Site cleanup mission requirements. This Plan builds on an integrated process developed by MSA that includes the other two Site prime contractors to more efficiently manage general purpose facility (GPF) space requirements. This process is centered on the activities conducted by, and the decisions made under the authority of, the Joint Contractor Space Utilization Board (JCSUB).

This Plan identifies the current status of GPFs that support the Site cleanup mission, with respect to office, shop, and warehouse and storage space capacity. Specifically, this Plan offers an updated analysis of GPF capacity, availability, ownership, uses, sizes, locations, and other key features to be used by Site managers, planners, program leads, and other relevant facility users who serve the Site cleanup mission.

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4 Bechtel National, Inc., is the contractor responsible for construction of the Waste Treatment and Immobilization Plant but is not responsible for managing GPFs.
The facilities supporting the Site cleanup mission must remain viable throughout the years leading to mission completion, projected to continue through the year 2062. However, many Cold War era GPFs, along with some of the other GPFs, are not anticipated to last until mission completion without requiring major renovations or replacement. The planning horizon for this Plan is through 2050.

Over the years, MSA has developed and shared among the contractors useful tools that have been used to assist with facility analysis and planning. A key tool is the Facility Lifecycle Data Model (FLDM) which assists in the predictive analysis of a facility’s physical structure and its major subsystems (i.e., HVAC and roof systems). The FLDM tool is used to estimate the investments needed on behalf of a facility through the end of its mission life.

MSA developed another tool, the Hanford Facilities Availability Listing (HFAL), to support facility management. This HFAL tool is accessible to all three prime contractors on a website hosted by MSA Real Estate Services. The HFAL lists facilities that are available for re-use by DOE, CHPRC, MSA, and WRPS, and enables contractors to post their unique facility needs. HFAL is also available to non-prime contractors.

Several current Site activities presented a challenge in defining the pool of GPFs and in developing plans for the future.

- During fiscal years 2016 and 2017, federal employees were relocated and consolidated into one office complex within the City of Richland. Consolidation activities often required multiple moves because of the full use of these facilities and to accommodate active renovations. The relocation activities were ongoing during Plan development, and the ongoing changes in facility uses posed challenges to tracking occupancy parameters.

- The River Corridor Cleanup Contract ended in 2016. The facilities that had been assigned to that contract were reassigned to current, ongoing contracts. The information presented in this Plan provides the most available current information regarding GPF reassignment to the current prime contractors, although this reassignment had not fully been captured in facility information systems.

- Site prime contracts are nearing their ending dates. Therefore, conducting planning into the next acquisition period becomes somewhat uncertain, since the alignment of contract scope is not yet known at this time. Also, facility management planning for the Site lifecycle (i.e., beyond the life of each contract) is not necessarily required by each of the contracts, and in some cases, the lifecycle baseline is still under development. However, this 2017 Plan incorporates information into the outyear as much as possible.

This Plan provides a framework for making present and long-term facility decisions, documents the process used for developing the framework, and describes the tools that have been developed to manage GPFs on the Site.
1.2 Additional Planning Considerations

Planning considerations that were incorporated into this Plan are derived from the Richland Operations Office Vision 2016 -2028, the 2017 DOE Lifecycle Baseline schedule and ORP Strategic and System Plans, and other MSA plans, such as the Infrastructure and Services Alignment Plan (HNF-44238), the Infrastructure Reliability Projects Priority List forecasts needs as documented in infrastructure system master plans. A list of the master plans that were reviewed is provided in Appendix G.

Benchmarking facility management at other government agencies and industry was conducted to: identify how they manage similar facilities; examine new and innovative tools and incentives; and compare different ways to manage offices, shops, and warehouse and storage space. The review results (see Appendix F) were used to form a consistent, integrated approach in developing this Plan and are listed as follows.

- Plans analogous to this Plan were not identified. However, other related facility management plans are used by other organizations.

- A uniform approach to measuring use metrics was not apparent. However, specific examples of use were observed by the DOE’s National Nuclear Security Administration, U.S. Department of Interior, U.S. Fish & Wildlife Service, Idaho National Laboratory, and U.S. Navy.

- Experience at the Idaho National Laboratory indicates that facilities are more optimally used when facility use is tied to cost.

- Facility planning should take into account the larger vision for the Site and be forward-looking (as much as 50 years).

- Facility planning benefits from strong senior management support.

Benchmarking Information Sources

**U.S. Government**
- General Services Administration
- U.S. Department of Defense
- U.S. Department of Energy
  - Idaho National Laboratory
  - Los Alamos National Laboratory
  - National Nuclear Security Administration
  - Office of Asset Management
- U.S. Department of Homeland Security
- U.S. Department of the Interior
- U.S. Fish & Wildlife Service
- U.S. Navy

**Industry**
- Architect Magazine
- Central Washington University
- Building Design + Construction Magazine
- Industry Authors

**Other Nations**
- Western Australia Government
1.3 Purpose

This Plan’s purpose is to describe a plan for managing GPFs, promote efficient Site operations and projects, and lead to reduced costs and reduced deficiencies. This Plan helps address longstanding and emerging challenges of GPFs that affect efficient Site operations.

Building on the facility management process improvements from the 2012 Facilities Master Plan, this Plan includes: 1) a Sitewide multi-contractor GPF list; 2) a description of the current statuses of the GPFs; 3) a description of GPFs supply and demand; 4) a description of the overall process that will be used to manage GPFs; and 5) recommendations to continue to improve facility management efficiency. Site prime contractors provided data input and reviewed data summarized in this Plan.
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2. HANFORD SITE GENERAL PURPOSE FACILITIES

This section presents the current state of Site GPFs, describes the methodology for identifying GPFs, and introduces the current GPF inventory available to the Site cleanup mission. Key definitions for use in this Plan are presented in the “Key Definitions” text box.

**KEY DEFINITIONS**

- **General purpose facilities** are available to support purposes general in nature and could be potentially reassigned to support multiple projects. General purposes include providing space for: 1) offices, 2) shop, or 3) warehouse and storage space. Non-general purposes include providing space to support: specific processes (e.g., groundwater pump-and-treat processes); utilities (e.g., telecommunications or electrical transmission); or another specialized purpose. Facilities that potentially could be reassigned to support multiple projects are those that are designed and configured such that other projects could reuse the facility for the same purpose (office, shop, or warehouse and storage) without significant facility design changes or alterations. GPFs may be DOE-owned or leased facilities. Facilities that are <500 square feet in area are not included in the list of GPFs in this Plan because of their relatively small size.

- **GPF dedicated facilities** are GPF facilities currently dedicated to a specific project mission. They meet the GPF definition, with the exception that their uses are dedicated (based on location and content) to support one specific mission. Once that mission is completed, they could be considered for reassignment and be placed back into the pool of available GPFs.

- **Programmatic facilities** are those that provide space to support the following types of non-general purposes: specific processes (e.g., groundwater pump-and-treat); utilities (e.g., telecommunications or electrical transmission); or some other specialized purpose.

2.1 Data Acquisition

The GPF list for this Plan was developed from a comprehensive list of Site facilities. The Facilities Information Management System (FIMS) and CareTaker are the main information systems that were used to populate the initial facilities list. Numerous meetings were held with the prime contractors and their respective facility representatives, and other subject matter experts to refine the list. The Stewardship Information Portal served as a key tool to support this collaboration and was used to help validate key facility information. The outcome of these activities identified 1,369 facilities that support the Site cleanup mission.

2.2 Methodology Used to Identify General Purpose Facilities

The comprehensive list was used as the basis for developing the GPF list. A series of filters were developed to sort through the comprehensive list and identify the GPFs. Figure 2-1 shows the division of these of how Site facilities were categorized through a process of elimination. Appendix A lists the full inventory of the Site’s GPFs. Appendix B lists the full inventory of Site’s GPF dedicated facilities.
The following describes the series of filters applied, as shown in Figure 2-1, to identify the 292 GPFs that are the focus of the analysis and planning activities of this Plan.

- One thousand three hundred sixty-nine facilities support the cleanup mission, according to FIMS, the CareTaker database, and subject matter expert input. Eight hundred twenty-two are in various stages of demolition, are <500 square feet in area (such as utility support facilities), and/or are contaminated by radionuclides.

- Five hundred forty-seven facilities (40%) are maintained in operational or standby status. One hundred twenty-eight of these facilities provide space to support non-general purposes (i.e., programmatic facilities). Non-general purposes include specific processes,

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5 In this Plan, three facilities are counted more than once because they are used by different organizations or for different, primary purposes: 1) 825 Jadwin is used by DOE, CHPRC, and MSA and is counted three times; 2) 2101M is used as office, shop, and warehouse space and is counted three times; and 3) 1979 Snyder is used by MSA and the HPM Corporation and is counted twice. The total facility count would be 1,364 unique buildings, if these facilities were counted only once.
such as groundwater pump-and-treat processes; utilities (e.g., telecommunications or electrical transmission); or another specialized purpose.

- Four hundred nineteen facilities (31%) may potentially be classified as GPFs. One hundred twenty-seven are dedicated to a specific project mission and currently could not be reassigned to support multiple projects. These 127 are considered GPF dedicated facilities. General purpose dedicated facilities are outside the scope of this Plan, but the Appendix B list is maintained along with the GPFs list for future planning.

- Two hundred ninety-two facilities (21%) are classified as GPFs. These facilities are the focus of the analysis and planning activities captured in this Plan.

### 2.3 Inventory of General Purpose Facilities

The 292 GPFs are comprised of 249 offices, 25 shops, 14 storage facilities and four warehouses. These GPF facilities provide over 2.2 million square feet of space. Most notably, office facilities account for the vast majority of the GPFs.

The supply and demand analyses for offices, shops, and warehouses and storage facilities are discussed in Sections 4, 5, and 6, respectively. The office space analysis is conducted at a more detailed level because office space accounts for ~80% of GPF space.

Each GPF is either DOE-owned or leased. DOE-owned facilities are located on the Site. Leased facilities are located off site, within the City of Richland (not on DOE-owned land) and account for the majority of the larger GPFs that support the Site cleanup mission. Table 2-1 summarizes by contractor the DOE-owned and leased GPFs. Table 2-1 also identifies an “Other” category that includes GPFs that provide office space to RL, ORP, and the HPM Corporation (HPMC).

<table>
<thead>
<tr>
<th>Contractor</th>
<th>DOE-Owned Facilities</th>
<th>Area (square feet)</th>
<th>Leased Facilities</th>
<th>Area (square feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHRPC</td>
<td>131</td>
<td>395,144</td>
<td>4</td>
<td>91,428</td>
</tr>
<tr>
<td>MSA</td>
<td>37</td>
<td>391,013</td>
<td>13</td>
<td>332,997</td>
</tr>
<tr>
<td>WRPS</td>
<td>79</td>
<td>509,943</td>
<td>22</td>
<td>240,229</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>280,274</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>247</strong></td>
<td><strong>1,296,100</strong></td>
<td><strong>45</strong></td>
<td><strong>944,928</strong></td>
</tr>
</tbody>
</table>

The GPFs are a mixture of hard-walled buildings and trailers. The GPF construction types are important, since the GPF type has a direct effect on structure lifecycle. Hard-walled buildings
typically are constructed with wood or metal-framed material and have average lifecycles of 65 or 90 years, respectively, while the average trailer lifecycle is 30 years.

Over 70% of the GPFs are trailers, accounting for 37% of the GPF space. The average space provided by trailers is much less than hard-walled buildings, and as a result, poses greater challenges to satisfy full use requirements.

Table 2-2 lists the number of GPF facilities by location. The greatest number of facilities and the largest area of GPFs are in the 200 East Area. The second largest amount of GPF space is provided by the relatively small number of GPFs within the City of Richland. However, the City of Richland GPF space is limited to 29 facilities. Nearly half of the total GPF area (912,048 square feet) is provided by this relatively small number of those GPFs within the City of Richland.

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of Facilities</th>
<th>Area (square feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 Area</td>
<td>21</td>
<td>45,776</td>
</tr>
<tr>
<td>200 East Area</td>
<td>137</td>
<td>921,953</td>
</tr>
<tr>
<td>200 West Area</td>
<td>74</td>
<td>237,301</td>
</tr>
<tr>
<td>300 Area</td>
<td>8</td>
<td>15,240</td>
</tr>
<tr>
<td>400 Area</td>
<td>6</td>
<td>58,370</td>
</tr>
<tr>
<td>600 Area</td>
<td>17</td>
<td>50,340</td>
</tr>
<tr>
<td>Richland</td>
<td>29</td>
<td>912,048</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>292</strong></td>
<td><strong>2,241,028</strong></td>
</tr>
</tbody>
</table>

Population projections were made for the Site using data provided by the Hanford Site Population Projections for 2017 – 2027 (HNF-60895). This projection publication provides snapshots of the current distribution of the Site personnel population. The population projections are developed from input from the Site contractors.

Currently, the majority of the Site population resides within the City of Richland.

Population projections show a growth in the number of employees anticipated over the next 10 years in the 200 East Area. The anticipated growth is described in the analysis in Section 4.
3. **SITEWIDE FACILITY MANAGEMENT PROCESS**

The Sitewide Facility Management Process centralizes facility and space planning activities for GPFs. The process is comprised of a structured business forum. The Sitewide Facility Management Process flow shows: 1) how facility management is to be conducted; 2) how facility information systems are used to capture and share key information; and 3) how the Joint Contractor Site Utilization Board (JCSUB) oversees the facility management activities (Section 3.1). The facility management process (Figure 3-1) demonstrates the Facility Management Process flow and identifies JCSUB involvement within the process.

![Figure 3-1. Facility Management Process Flow Diagram.](image)

Each contractor is responsible for its own internal facility management process, as it is responsible for managing its own space planning needs. If these needs cannot be met internally, the Sitewide Facility Management Process is used to address the facility needs by involving the other prime contractors.

The Sitewide Facility Management Process allows face-to-face interaction among the prime contractors with access to facility information automated tools used to simplify optimization of space use across the Site. The Facility Management Process is continually being updated to include new capabilities that adapt to the contractors’ facility challenges.
3.1 Integration - Joint Contractor Space Utilization Board

Formed in 2014, the JCSUB organization provides oversight of the GPF planning process and consists of an interactive, multi-contractor partnership of members representing the prime contractors and DOE to address facility management issues together, rather than independently.

Hosted by MSA Real Estate Services, the JCSUB meets quarterly to support collaboration on Site facility interests and review current available inventories. The Sitewide Facility Management Process automated tools (Section 3.2) are used to aid decision making during these meetings. Representatives from the Contractor Integration Board are also invited to attend the JCSUB meetings. The JCSUB operates under Joint Contractor Space Utilization Board Charter MSC-CHT-FPROP-00016, which forms the JCSUB foundation. During the quarterly meetings, the JCSUB discusses facility and space needs, challenges, experiences, and concerns, and provides updates for the JCSUB to maintain a current, Sitewide perspective on facility status. This forum is recognized as an effective ways to collaborate on Site facility interests.

The JCSUB members use the Sitewide Facility Management Process and the automated tools to stay continuously informed on issues to make optimal decisions on: facility availability; facilities needing to be decommissioned and demolished; and future space availability,. For example, the JCSUB adopted a best management practice target utilization of 85% for office facilities (with a desired maximum of 90% utilization). The JCSUB continues to address relevant emergent facility challenges by sharing information and plans among contractors and maintaining communications between meetings.

JCSUB Success Story

The JCSUB oversaw the dispositioning of buildings and trailers when the Waste Sampling Characterization Facility was shut down. All three contractors had a competing interest in using many of these facilities. The contractors used the JCSUB meeting forum to discuss Sitewide needs that resulted in mutual agreement among the contractors on using each facility, and to decide which facilities would be shut down and not reused.
3.2 Facility Management Information Systems and Automated Tools

MSA Real Estate Services developed, and is responsible for maintaining, Sitewide facility information systems accessible to Site contractors as automated web-based applications (tools). MSA Real Estate Services championed a facility information vision that governs the developed applications and interconnects the different datasets to be accessible in a simple-to-use geographic database. FIMS, CareTaker, HFAL and FLDM are the primary tools that provide comprehensive Sitewide facility information.

3.2.1 Facility Information Systems – FIMS and CareTaker

FIMS and CareTaker are the two primary facility information systems used and are integral to the Hanford Facility Management Process. These information systems are the main information sources for identifying GPFs for this Plan and are sources of detailed facility data.

FIMS is the DOE’s complex-wide repository for tracking real property assets. Governed by DOE Order 430.1B, Real Property Asset Management, and other guidance documents, FIMS contains hundreds of fields that capture data for Site facilities and other real property. With the vast amount of data, FIMS serves as the primary information source for facility management and as a source of Site facility information for DOE Headquarters.

CareTaker is the official facility information processing center and accounts for Site buildings, trailers, and structures. The three prime contractors use CareTaker as the Site’s single facility management tool to manage their facility information. The contractors share annual maintenance and licensing costs that result in cost savings to DOE. The application captures the key facility data fields beyond what is contained in FIMS. CareTaker also provides facility managers the capability to monitor and control their space needs and business needs which change continuously.

Together, FIMS and CareTaker provide a comprehensive data set for Site facilities. The information from these systems is fed as the core data set to facility management automated applications (“tools”), specifically the HFAL (Section 3.2.2) and FLDM (Section 3.2.3).

3.2.2 Hanford Facility Availability Listing

The HFAL was modeled after the commercially available Multiple Listing Services (MLS) that markets available facilities to other interested parties. HFAL is used by Site prime contractors to search for facilities that are available for re-use. A screenshot of HFAL in use is shown in Figure 3-2.

HFAL provides an online forum for the contractors to post facility needs and advertise space that is available for re-use. This process promotes facility sharing activities between Site contractors. Site contractors submit high-level facility information (size, facility type, photographs, location, floor plan, and condition) about upcoming facilities that they no longer need. In turn, HFAL publishes the facilities as potential assets becoming available to be considered by other interested
MSA Real Estate Services, has retooled the HFAL application to provide the JCSUB the ability to broker the use of individual rooms within a facility and up to an entire facility. This expanded capability gives facility managers and space planners Sitewide ability to maximize the use of the space.

### 3.2.3 Facility Lifecycle Data Model

The MSA Real Estate Services group created the FLDM in 2012 (in support of the 2012 Facilities Master Plan) as a predictive modeling tool. The FLDM embraces industry standard predictability concepts and uses comparative integrity data to establish a facility’s lifecycle profile. The FLDM assists in the predictive physical degradation analysis of a facility and its major subsystems (HVAC and roof systems). The FLDM compares a facility’s longevity with a program’s mission end date.

The FLDM examines HVAC and roof system design lifecycles where potential catastrophic failure could compromise a facility’s operational continuity. Many facilities will reach their ends of life during various stages of the cleanup mission. Failure of these facilities and their primary subsystems may potentially impact a project’s safety and/or operations, and create potential risks with negative consequences, if left unresolved. Figure 3-3 shows an online dashboard depiction of a specific facility profile created by the FLDM tool.
The FLDM offers a dashboard interface that includes five information panels.

1. The Facility Profile Panel (top left) provides administrative information.

2. The General Asset Degradation Panel (center) illustrates asset degradation over time (see additional information in Appendix E).

3. The Current Facility Condition Panel (top center) provides facility and subsystem data (see additional information in Appendix E).

4. The Facility System’s Lifecycle Composite Panel (bottom panel) is a graphical representation of the lifecycle relationship to project mission end date.

5. Anticipated Facility Investment Cost Panel (upper right panel) is a graphical chart illustrating the overall estimated replacement costs over the project duration.

The FLDM contains data to analyze the following.

- **Predicts Lifecycle/Longevity**: The FLDM illustrates physical facility and associated subsystems comparative data with forecasted design lifecycles to determine a given facility’s ability to sustain acceptable performance through assigned project completions.

- **Estimates High-Level Replacement Costs**: The FLDM forecasts replacement costs, at a high level, for facility and subsystems over the facility lifecycle. Several Site facility
construction projects were reviewed to acquire a representative comparison for estimating facility replacement costs. The costs were adjusted for construction/replacement performed on the Site and future worth values, based on the forecasted cost year.

If major upgrades or capitalization investments are not implemented, physical degradation will continue to accelerate at a much higher rate until a facility or a facility’s subsystems reach predicted physical failure.  

The FLDM is accessible to Site contractors on the MSA Real Estate Service website.

3.2.4 Other Facility Management Information Tools

MSA has created additional facility management information tools for Site contractor use. These tools are designed to enhance facility data accuracy and share facility information by interconnecting data from independent systems and making the information available through simple-to-use applications. The small but important utility tools used are described as follows.

- The Status Change Notice application is used to process facility data changes within CareTaker data fields. The contractors submit data changes, the application routes the changes for validation, field verification is performed, CareTaker makes official data changes, and the application notifies the submitter of change completions.

- The Facility Number Request is the official Hanford Facility Number Site used to issue facility numbers. The contractors submit new facility number requests. The application routes the request to the appropriate reviewers, collects reviewer comments, registers the new facility number in the CareTaker database, and returns the new number to the requester automatically. Processing turnaround time is approximately two days rather than the several weeks required before the tool was implemented.

- The Stewardship Information Portal is a geographic information system (GIS) application that displays facility and land profile information, and links many independent information systems together for general user awareness. This application is one of the most recently developed automated toolsets and is gaining more popularity for searching information by GIS (mapping) references.

Refer to Appendix E for more information about these tools and how they are used in the facility management process.

Information regarding future asset performance information is available from the Institute of Public Works Engineering Australia in *Condition Assessment and Asset Performance Guidelines*, 2012.
4. OFFICES - ANALYSIS

This section compares the results of the supply and demand analysis for GPF office space. Results of the comparison of the three programs combined (PRC, MSC, and TOC) are described first, followed by separate results by individual program. This section concludes with information regarding the supply of other programs. The data presented in this section were reviewed by facility management and subject matter experts, and incorporate information from a review of the infrastructure master plans, including the Infrastructure and Services Alignment Plan (HNF-44238, Revision 8).

4.1 PRC, MSC, and TOC General Purpose Office Facilities

This section presents the comparison results of the supply and demand analysis for PRC, MSC, and TOC combined. Two-hundred forty-nine (249) GPF offices support the Site cleanup mission. The distribution between the different types of facilities is shown in the text box titled, “PRC, MSC, and TOC GPF Offices.”

The following were observed regarding the GPF offices.

- More than 80% of the GPF office facilities (206 facilities) are DOE-owned. The average space provided by DOE-owned facilities is ~4,500 square feet.

- The 43 leased GPF office facilities provide nearly 50% of the office space (856,664 square feet). The average amount of space provided by the leased facilities is ~20,000 square feet.

- Approximately 81% of the GPF office facilities are trailers. However, trailers provide only 30% of the GPF office space. Such facilities typically are much smaller than hard-
walled buildings (the average trailers measure 2,700 square feet, while the average hard-walled buildings measure 4,500 square feet in area).

- When observing the geographical distribution of the GPF office facilities, most (71%) facilities are located in the Central Plateau (total 862,013 square feet). However, the office space in the 27 City of Richland, facilities (total 832,784 square feet) is nearly the same amount as that provided by the 177 Central Plateau facilities.

Figure 4-1 compares individual GPF office spaces from the largest to smallest in area.

**Figure 4-1. Comparison of Individual GPF Office Sizes from Largest to Smallest.**

![Graph showing comparison of individual GPF office sizes](image)

The information presented in Figure 4-1 reveals that 85% of the GPF office facilities are each <10,000 square feet. This relatively large number of facilities account for just ~30% of the total GPF office space, reinforcing that the majority of office facilities are trailers (generally are smaller facilities).

Figure 4-2 shows a similar listing of the individual GPF office facilities (from largest to smallest) but showing the cumulative areas of these facilities.
Figure 4-2. Cumulative Area of GPF Offices from Largest to Smallest.

The Figure 4-2 data indicate the following.

- The distribution of office space is nearly equal between DOE-owned and leased space.
- The largest 14 GPF office facilities account for slightly >50% of the GPF office space but represent only 7% of the total number of GPFs.

The 14 largest GPF office facilities range in size from ~34,000 to ~127,000 square feet. Eleven are leased facilities within the City of Richland. Three are located in the 200 East Area. Long-term planning regarding GPF office space will need to consider these 14 facilities, since they house a significant portion of the populations of Site office users.

Table 4-1 lists the number of facilities and area of the GPF offices for each of the programs. Key observations of Table 4-1 data indicate the following.

- 38% of the office space (683,642 square feet) is used to support the TOC, which aligns with the population data projection developed in support of the Hanford Site Population Projections for 2017 - 2027 (the TOC employs the greatest number of office workers).
- The PRC has the greatest number of GPF offices at 127. Yet these facilities only account for 24% of the total office space, showing they occupy many small facilities (i.e., trailers).
The “Other” facilities provide office space for ORP, RL, and HPMC (which provides Site occupational medical services). More information on these other facilities is provided in Section 4.5. The comparative analysis of supply and demand was conducted, after developing an understanding of the GPF offices, facility types, their sizes and locations, and their distribution among the programs.

The JCSUB identified an 85% operational best management practice target utilization that allows for the most efficient use of the space and provides adequate flexibility to accommodate changing occupancy demands. If utilization is significantly greater than 85% (i.e., greater than 90%), a limited space is available to accommodate change, and organizations lose flexibility, which often requires multiple moves to accommodate changing occupancy demands. Utilization significantly less than 85%, results in the space not being used efficiently. Therefore, the analysis considers the maximum utilization of 90% when comparing the supply of office space with the demand. The supply calculation is presented in the text box titled, “Calculation for Overall Office Facility Supply.”

The estimate for GPF office space demand over time is calculated based on a key assumption: the demand for office space in a particular year is proportional to the planning cost profile for that year. Using that assumption, the demand is first calculated by developing for each contractor a ratio of the square feet in use in 2017, to the corresponding 2017, planning cost profile. Then, that ratio is applied for each contractor to the lifecycle planning estimate for each subsequent year to determine the demand in the outyears. The demand calculation is presented in the text box titled, “Calculation for Overall Office Facility Demand.” Appendix D provides more information regarding the calculations used to estimate the supply and demand of GPF office space over time.
Figure 4-3 shows the combined PRC, MSC, and TOC supply and demand estimates for GPF office space.

The following observations can be made, based on the comparison of the supply and demand shown in Figure 4-3:

- Beginning in 2018, the demand for office space will exceed the supply. There will be an insufficient supply of GPF office space even when considering the addition of GPF office space through the leasing and construction of new facilities. Appendix G presents additional information regarding the planned facilities.

- The demand for GPF office space is anticipated to significantly exceed the supply in 2021, with a peak shortfall of ~300,000 square feet.

- After 2021, demand will continue to exceed supply for GPF office space, even with GPF office space through the addition of new facilities. Appendix G lists the planned Site facilities.

- The current utilization across all programs is 89%, almost the 90% maximum utilization target. This is most likely due to increases in staffing, while using existing facilities and at the same time not adding or replacing many facilities. As a result of this high
utilization, there is limited space to accommodate change and less flexibility in addressing occupancy demands.

Figure 4-4 shows the even greater declining supply of total square feet of GPF office space when facility lifecycle is considered. The FLDM provided information used to develop Figure 4-4.

Figure 4-4. PRC, MSC, and TOC GPF Office Space Supply and Demand Forecast When Facility End of Life is Considered.

As shown in Figure 4-4, when the lifecycle of the GPFs are considered, the supply of facilities declines at an increasing rate. Many GPF office facilities are anticipated to exceed their estimated lifecycles before the completion of their respective missions. If these facilities are not replaced, as they “age out”, the estimated available supply will decrease. The gap between the demand and the supply of GPF office space across the Site, i.e., the shortfall of office space, would grow larger, increasing the amount of needed GPF space, and thus, challenging the ability to support the cleanup mission with the necessary facilities.

The challenges in meeting the need for GPF office space are significant. The current supply appears to be insufficient. With the projected gap of \(~200,000\) to \(~300,000\) square feet in the near future, further analysis needs to be completed to determine each specific program GPF office space needs along with the areas that the space is needed. Actions for addressing the challenges and shortfall of office space are provided in Section 4.6.
4.2 PRC General Purpose Office Facilities

This section presents the results of the comparative analysis of supply and demand for PRC. One-hundred twenty-seven (127) PRC GPF offices support the Site cleanup mission. The complete list of 127 facilities, along with their measured areas and other information, is provided in Appendix A.

The distribution between the different types of facilities is shown in the text box titled, “PRC GPF Offices.” The following observations can be made regarding the PRC GPF offices.

- DOE owns ~97% of the PRC GPF office facilities (123). Only 3% (four facilities) are leased facilities. However, the four leased PRC GPF office facilities provide ~21% of the office space (91,428 square feet). This is because the average space provided by the leased facilities is ~23,000 square feet (the average space provided by DOE-owned facilities is ~2,800 square feet).

- Trailers comprise ~94% of the PRC GPF office facilities (120). However, since trailers generally tend to be smaller (the PRC GPF office trailers average ~2,600 square feet in area, while hard-walled buildings average 17,500 square feet in area), they provide ~72% of the total GPF office space (310,356 square feet).

- The Central Plateau contains the majority (69%) of the facilities and provide ~60% of PRC’s office space (258,298 square feet). Facilities located within City of Richland offer the next greatest area (85,704 square feet) of GPF office space, which is provided by a single facility (825 Jadwin). The space used by PRC at 825 Jadwin is one of the 14 largest facilities (the facility portion leased to PRC is considered to be the fourth largest GPF office facility when compared individually with the other facilities). See Appendix A for additional information on these facilities.
Figure 4-5 shows the supply and demand estimates for the PRC GPF office space. Calculations used to develop the estimates are as described in Section 4.1. Additional information regarding the calculations is presented in Appendix D.

The following observations can be made, based on the comparison of the supply and demand shown in Figure 4-5.

- Beginning in 2018, the demand for office space will exceed the supply. Although the supply remains at relatively the same level in the near future, the demand is anticipated to increase as D&D activities increase. Demand is also anticipated to exceed supply during the period when the canyon facilities are planned to be demolished (beginning in approximately 2025).

- The slight supply decrease between 2017 and 2018, is attributed to lease terminations of some trailers. The estimated disposition year for each facility is shown in Appendix A.

Figure 4-6 shows an even greater declining supply of PRC GPF office space when a facility’s end of life is considered. The FLDM provided the information used to develop Figure 4-6.
As shown in Figure 4-6, the gap or shortfall of office space increases significantly when the GPF lifecycles are considered. If aging facilities are not replaced, the shortfall of office space will grow larger, and increase the amount of needed GPF space, thereby challenging the ability to effectively support the PRC activities with the necessary facilities.

The challenges in meeting the need for PRC GPF office space are significant. The current supply appears to be insufficient. The peaks in demand for office space present an especially tricky challenge given the time gap between the peaks. The area with the greatest PRC GPF office space currently is the Central Plateau, and the likely future demand for PRC GPF office space will continue to focus in that area. Actions for addressing the projected challenges and shortfall of office space are provided in Section 4.6.
4.3 MSC General Purpose Office Facilities

This section presents the results of the comparative analysis of supply and demand for MSC. Twenty-nine (29) MSC GPF offices support the Site cleanup mission. The distribution between the different types of facilities is shown in the text box titled, “MSC GPF Offices.” The complete list of the 29 facilities, their sizes, and other information, is provided in Appendix A. The following observations can be made regarding the MSC GPF offices.

- Approximately 62% of the GPF office facilities are DOE-owned (18). However, the 11 leased MSC GPF office facilities provide ~63% of the office space (253,733 square feet). This is because the space provided by the leased facilities averages ~23,100 square feet (DOE-owned facilities provide an average of ~8,300 square feet).

- Approximately one-half (52%) of the MSC GPF office facilities are hard-walled buildings (15) and one-half (48%) are trailers (14). However, since hard-walled buildings generally tend to be larger (MSC GPF office hard-walled buildings average ~21,400 square feet, while trailers average ~5,900 square feet), they provide ~80% of the GPF office space (321,455 square feet).

- Although the majority (55%) of the MSC facilities (16) are located in the Central Plateau (comprising 146,010 square feet), the area with the greatest amount of GPF office space is within the City of Richland (253,061 square feet) at 10 facilities. This is because the facilities within the City of Richland are larger (averaging ~25,000 square feet) than the facilities in the Central Plateau (averaging ~9,100 square feet).

Figure 4-7 shows the supply and demand estimates for the total MSC GPF office space, when a facility’s end of life is considered. The calculations used to develop the estimates are as described in Section 4. Additional information is presented in Appendix D.
As shown in Figure 4-7, a shortfall of ~15,000 to ~20,000 square feet is anticipated in the next several years for MSC. This is because the supply remains at relatively the same level in the near term, while facility demand continues to be greater than the 90% target utilization. Although the demand for MSC office space is estimated to decrease significantly after 2024, this decrease is partially due to the effects of inflation (i.e., decrease in buying power of future cost profiles) and is accentuated by the graph time period changing after 2025 (the supply versus demand shown in the years following 2025, are grouped by 5-year periods, instead of being shown by individual years). As further planning is conducted for the Site, those trends may change. The work scope of the MSC supports other Site activities and is anticipated to be relatively proportional to those activities. Therefore, close integration between MSC facility planning and Site project planning is necessary to maintain an inventory of adequate, available space.

Table 4-2 lists information about a new MSC facility planned for the 200 East Area, which will provide office space for the electrical utilities program. The facility size is still to be evaluated. Therefore, Figure 4-7 does not show this facility addition.

<table>
<thead>
<tr>
<th>Area</th>
<th>Name</th>
<th>Ownership</th>
<th>Area (square feet)</th>
<th>Build Year</th>
<th>Assumed Available Occupancy Year</th>
<th>Information Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 East</td>
<td>EU Office Facility</td>
<td>DOE Owned</td>
<td>Not yet identified</td>
<td>2024</td>
<td>2025</td>
<td>Hanford Site Electrical Utilities Master Plan (HNF-6608, Rev. 4)</td>
</tr>
</tbody>
</table>

Table 4-2 shows an even greater declining supply of total square feet of MSC GPF office space when facility lifecycle is considered. The FLDM provided the information used to develop Figure 4-8.
As shown in Figure 4-8, when the lifecycle of the GPFs are considered, the supply of facilities declines at an increasing rate, and the office space shortfall increases to ~45,000 to ~60,000 square feet in the near term. If aging facilities are not replaced, the shortfall of office space will continue to grow, increasing the amount of needed GPF space, and therefore, challenge the ability to support the cleanup mission with the necessary facilities.

The challenge for providing MSC office space is somewhat different than the other two programs. The area with the greatest MSC GPF office space currently is in the City of Richland. It is likely the future demand for MSC GPF office space will continue to be predominantly in that area, as well as the Central Plateau and aligned to support the cleanup programs. Integrating the MSC needs with the cleanup programs will need to careful consideration. Actions to address the challenge for providing the MSC office space are provided in Section 4.6.
4.4 TOC General Purpose Office Facilities

This section presents the results of the supply versus demand analysis for TOC. Eighty-seven (87) TOC GPF offices support the Site cleanup mission. Information about these 87 facilities is provided in Appendix A. The following observations can be made regarding the TOC GPF offices.

- Although 77% of the TOC facilities are trailers (67), most of the space (79%) is provided by the 20 hard-walled buildings. This is because the hard-walled buildings are larger than the trailers.

- Most of the facilities (75%) are DOE-owned, comprising 65% of the office space (443,413 square feet).

- ~85% of the facilities are in the Central Plateau (74), comprising 67% of the space (457,705 square feet), with the remaining facilities within the City of Richland and the 600 Area.

Figure 4-9 compares the supply and demand estimates of TOC GPF office space in area (total square feet). The calculations used to develop the estimates are as described in Section 4.1 and discussed in Appendix D.
Figure 4-9 shows that a growing shortfall in the supply and demand begins in 2019, and continues through much of the rest of the GPF lifecycles. This is because supply remains at relatively the same level through the near-term years (through 2021), while the demand is anticipated to continue to increase support of WTP construction and operations. Near-term and long-term planning will be required to offer adequate office space to support the cleanup mission.

Table 4-3 lists five new GPF office facilities planned under the TOC. This includes three new leases in the City of Richland and a DOE-owned trailer in the 200 East Area in 2018, and a large office facility in 200 East Area in 2023, which is planned to address potential future office needs in support of ORP operations.
Table 4-3. Planned New TOC GPF Offices.

<table>
<thead>
<tr>
<th>Location</th>
<th>Name</th>
<th>Ownership</th>
<th>Area (square feet)</th>
<th>Build/Lease Year</th>
<th>Information Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 East Area</td>
<td>Industrial Hygiene Office Facility</td>
<td>DOE-Owned Trailer</td>
<td>9,500</td>
<td>2018</td>
<td>TOC Subject Matter Expert</td>
</tr>
<tr>
<td>Richland</td>
<td>1810TD Terminal Drive</td>
<td>Leased</td>
<td>5,000</td>
<td>2018</td>
<td>TOC Subject Matter Expert</td>
</tr>
<tr>
<td>Richland</td>
<td>1812TD Terminal Drive</td>
<td>Leased</td>
<td>5,000</td>
<td>2018</td>
<td>TOC Subject Matter Expert</td>
</tr>
<tr>
<td>Richland</td>
<td>1835TD Terminal Drive</td>
<td>Leased</td>
<td>6,000</td>
<td>2018</td>
<td>TOC Subject Matter Expert</td>
</tr>
<tr>
<td>200 East Area</td>
<td>Tank Farm Operations Center</td>
<td>DOE Owned</td>
<td>200,000</td>
<td>2023&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Infrastructure and Services Alignment Plan &lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> For the purposes of planning, it is assumed the planned Tank Farm Operations Center will be available for occupancy in 2024.


The new offices identified in Table 4-3 will help to provide adequate space in 2018, before the anticipated shortfall. However, based on the analysis of the data in Figure 4-9, it appears that the large office planned in the 200 East Area may not be sufficient to meet the needs for office space. Also, there are no projects identified in any formal budget submittal that addresses the gap to provide additional office space. Therefore, further supply versus demand analyses will be needed on a geographic basis and cost-benefit analyses will be required to evaluate the size and location of facilities that will be needed to address the shortfall.

Figure 4-10 shows the potential supply of total square feet of TOC GPF office space when the facility lifecycles are considered.

**Figure 4-10. TOC GPF Offices Supply and Demand Forecast When End of Facility Lifecycles are Considered.**
Unlike the other Site programs, the TOC does not appear to be significantly affected by the age of its facilities. The shortfall depicted in Figure 4-10 is not substantially greater than the shortfall shown in Figure 4-9. This is because most of the TOC facilities are newer facilities that will be available to support the mission need, particularly in the near term, within their anticipated lifecycles.

The challenges in meeting the need for TOC GPF office space are significant. The current supply appears to be insufficient to meet the upcoming demand. Further analyses is needed to support the justification for the planned office facility in the 200 East Area along with any other facilities that may be needed. In addition, the supply and demand of the TOC GPF office facilities has the potential to be affected, if locations of tank farm personnel change in response to the issues identified in the recent *National Institute for Occupational Safety and Health Report on Hanford Tank Farm Worker Safety*. This has the potential to create a significant impact on the supply of facilities that house TOC personnel and will require additional steps to maintain an adequate supply of TOC GPF office space. Actions to address the challenges and projected shortfall of office space are provided in Section 4.6.

### 4.5 Other General Purpose Office Facilities

The GPF office facilities support several programs in addition to the PRC, MSC, and TOC: six leased facilities in the City of Richland, provide office space for RL, ORP, and HPMC (which provides Site occupational medical services). Information regarding these six facilities is listed in Table 4-4.

<table>
<thead>
<tr>
<th>Property</th>
<th>Organization</th>
<th>Location</th>
<th>Ownership</th>
<th>Area (square feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2440 Stevens Center</td>
<td>GSA (ORP)</td>
<td>Richland</td>
<td>Leased</td>
<td>99,822</td>
</tr>
<tr>
<td>2420 Stevens Center</td>
<td>GSA (RL)</td>
<td>Richland</td>
<td>Leased</td>
<td>92,914</td>
</tr>
<tr>
<td>2430 Stevens Center</td>
<td>GSA (RL)</td>
<td>Richland</td>
<td>Leased</td>
<td>47,238</td>
</tr>
<tr>
<td>1979 SNYDER 1st Floor, HPMC OMS - 1979 Snyder 1st Floor</td>
<td>HPMC</td>
<td>Richland</td>
<td>Leased</td>
<td>24,226</td>
</tr>
<tr>
<td>FED BLDG USPO &amp; CH 825 Jadwin Ave - DOE</td>
<td>RL</td>
<td>Richland</td>
<td>Leased</td>
<td>10,978</td>
</tr>
<tr>
<td>1838TD, DOE - 1838 Terminal Drive</td>
<td>RL</td>
<td>Richland</td>
<td>Leased</td>
<td>5,096</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>280,274</strong></td>
</tr>
</tbody>
</table>

GSA = U.S. General Services Administration.  
HPMC = HPM Corporation.  

As shown in Table 4-4, these facilities account for ~ 300,000 square feet of office space. Other than the facility being used by HPMC, these facilities are occupied by RL and ORP personnel. It is anticipated that RL and ORP personnel staffing will remain relatively stable for the next ten years, as described in *Hanford Site Population Projections for 2017 – 2027*, and that these
facilities will remain available to provide office space. As leased facilities, it is assumed that these facilities will remain available for the life of the missions that each supports. However, although the current occupants of these six facilities are primarily RL and ORP personnel, it is possible the space may be used by other organizations in the future. For example, CHPRC and MSA personnel recently occupied several of these facilities. Therefore, future supply versus demand analyses should consider these facilities.

In addition to the GPF facilities listed in Table 4-4, an additional 11 leased facilities are considered GPF dedicated facilities. These include leased facilities dedicated to support specific mission elements. The majority of these facilities are leased by Bechtel National, Inc., to support WTP construction. The facilities are listed in Appendix B.

4.6 Conclusions

The projected shortfall of office space is significant. The supply versus demand analysis of office space shows a significant gap of ~200,000 to 300,000 square feet in the supply of future office space for several years, with gaps greater than 50,000 square feet in additional years, primarily driven by the needs on the Central Plateau (PRC and TOC). Several new facilities in the near term will provide a small increment of added space. However, this added space will not be enough to address the anticipated shortfall. Also, no capital line item projects were identified in a review of budget submittals that would address the need for additional office space.

To address the projected shortfall in GPF office space, recommended considerations for planning include the following.

- **Analysis by Geographic Area:** Additional analysis will be needed to further clarify and identify the location for a potential need for GPF office space. This detailed analysis would identify the employee populations at specific locations considering short-term needs (~200,000 to 300,000 square feet) and long-term needs (50,000 square feet) in developing recommendations to address the gap. This could involve defining the minimum size facility to meet the long-term needs and develop the strategy to provide space to meet peak demands where the demands exceed the minimum size.

A combination of leased space and trailers could be used to meet the peak demands depending on the locations the space is needed. This includes considering the location of future cleanup activities and the location of office personnel support those activities. Figure 4-11 shows the anticipated changes in the geographic distribution of office personnel from 2017 to 2027.
The data shown in Figure 4-11 indicate that the percentage of office personnel in the Central Plateau is anticipated to increase from 36% in 2017, to 51% in 2027. Therefore, it is likely that future office space needs will be greater in the Central Plateau than in other locations. The analysis by geographic area will need to be conducted in collaboration with the projects that will need additional space and likely will include both DOE offices.

• **Analysis of Additional Available Space:** Additional facilities could be considered to help address the supply shortfall. These include facilities that have an anticipated lifecycle that exceeds the currently planned disposition year. Such facilities, listed in Appendix E, could be considered for continued use beyond their planned disposition year. In addition, some GPF dedicated office facilities may become available for use by other projects.

While the GPF dedicated facilities are outside the scope of this Plan, they are included here to show the additional pool of office facilities that may become available in the future.

Table 4-5 shows by location ~300,000 square feet of GPF dedicated office facilities. These facilities may become available (but not simultaneously) for use by other projects when the current projects to which these facilities are dedicated are completed.
### Table 4-5. GPF Dedicated Offices by Location.

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of Facilities</th>
<th>Area (square feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 Area</td>
<td>1</td>
<td>960</td>
</tr>
<tr>
<td>200 East Area</td>
<td>10</td>
<td>41,440</td>
</tr>
<tr>
<td>200 West Area</td>
<td>11</td>
<td>51,638</td>
</tr>
<tr>
<td>300 Area</td>
<td>2</td>
<td>4,524</td>
</tr>
<tr>
<td>400 Area</td>
<td>1</td>
<td>1,452</td>
</tr>
<tr>
<td>600 Area</td>
<td>27</td>
<td>193,895</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>52</strong></td>
<td><strong>293,909</strong></td>
</tr>
</tbody>
</table>

- **Analysis in Coordination with Site Planning:** The projected shortfall of office space is significant. The supply versus demand analysis of office space shows a significant gap of ~200,000 to 300,000 square feet in the supply of future office space for several years, with gaps greater than 50,000 square feet in additional years, primarily driven by the needs on the Central Plateau (PRC and TOC). Several new facilities in the near term will provide a small increment of added space. However, this added space will not be enough to address the anticipated shortfall. Also, no capital line item projects were identified in a review of budget submittals that would address the need for additional office space.
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5. SHOPS - ANALYSIS

Shops are facilities where items are manufactured or repaired. They generally are unique and are dedicated to support specific cleanup mission facility needs. Shops may also house unique equipment, such as high-energy, rotating equipment; chemical management equipment; painting tools, etc.

Generally, GPF shops are assigned to support a particular mission and considered fully utilized, since they serve at capacity to support that particular mission. Three types of Site shop facilities (see text box) are defined by the type of work conducted in support of the Site’s cleanup mission. The data presented in this section incorporate information from an infrastructure master plan review, including the *Infrastructure and Services Alignment Plan*, and was reviewed by facility management subject matter experts.

5.1 Supply of General Purpose Shop Facilities

As listed in Table 5-1, 25 GPF shops support the Site cleanup mission and comprise 146,298 square feet in area.

![Types of GPF Shops]

| Types of GPF Shops |
|--------------------|------------------|
| 1. Shops that support maintaining tools and/or equipment. |
| 2. Shops that support construction and fabrication activities, including carpentry. |
| 3. Shops that support maintaining vehicles and mobile equipment, including vehicle paint shops. |

### Table 5-1. List of GPF Shops.

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>Type</th>
<th>Estimated Disposition</th>
<th>Area (square feet)</th>
<th>% Utilized</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>CHPRC GPF Shops</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2268E</td>
<td>Soil and Ground Water Shop</td>
<td>Tools and Equipment Maintenance</td>
<td>2050 *</td>
<td>15,450</td>
<td>100%</td>
</tr>
<tr>
<td>2269E</td>
<td>Engineering Procurement and Construction Shop</td>
<td>Tools and Equipment Maintenance</td>
<td>2051</td>
<td>15,450</td>
<td>100%</td>
</tr>
<tr>
<td>2610E</td>
<td>Engineering Procurement and Construction Shop</td>
<td>Construction and Fabrication</td>
<td>2052</td>
<td>15,450</td>
<td>100%</td>
</tr>
<tr>
<td>MO354</td>
<td>Office Trailer - at 2400E CPP Maintenance</td>
<td>Tools and Equipment Maintenance</td>
<td>2029</td>
<td>1,296</td>
<td>100%</td>
</tr>
<tr>
<td>MO495</td>
<td>Office Trailer - E of 2754W</td>
<td>Construction and Fabrication</td>
<td>2038</td>
<td>672</td>
<td>100%</td>
</tr>
<tr>
<td>MO743</td>
<td>Shop / Office Trailer - S of 272WA</td>
<td>Tools and Equipment Maintenance</td>
<td>2044</td>
<td>3,360</td>
<td>100%</td>
</tr>
<tr>
<td>MO2162</td>
<td>Tool Crib Trailer - NW of 2740W</td>
<td>Tools and Equipment Maintenance</td>
<td>2033</td>
<td>1,440</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td><strong>7 CHPRC GPF Shops = 53,118 square feet</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>MSA GPF Shops</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2101M</td>
<td>Warehouse Shops and Office Building (Shop Portion)</td>
<td>Tools and Equipment Maintenance</td>
<td>2057</td>
<td>9,486</td>
<td>98%</td>
</tr>
<tr>
<td>2266E</td>
<td>Closure Support Center</td>
<td>Tools and Equipment Maintenance</td>
<td>2055</td>
<td>26,800</td>
<td>100%</td>
</tr>
<tr>
<td>2711E</td>
<td>Fleet Equipment Maintenance Shop</td>
<td>Vehicle and Mobile Equipment Maintenance</td>
<td>2053</td>
<td>7,406</td>
<td>100%</td>
</tr>
</tbody>
</table>
Table 5-1. List of GPF Shops.

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>Type</th>
<th>Estimated Disposition</th>
<th>Area (square feet)</th>
<th>% Utilized</th>
</tr>
</thead>
<tbody>
<tr>
<td>2711EA</td>
<td>Regulated Equipment Maintenance Shop</td>
<td>Tools and Equipment Maintenance</td>
<td>2055</td>
<td>4,582</td>
<td>100%</td>
</tr>
<tr>
<td>2711EB</td>
<td>Heavy Mobile Equipment Maintenance Shop</td>
<td>Vehicle and Mobile Equipment Maintenance</td>
<td>2056</td>
<td>4,494</td>
<td>100%</td>
</tr>
<tr>
<td>2715EC</td>
<td>Paint Shop</td>
<td>Tools and Equipment Maintenance</td>
<td>2052</td>
<td>1,021</td>
<td>100%</td>
</tr>
<tr>
<td>2719EA</td>
<td>Electrical Shop - At 4th and Baltimore</td>
<td>Tools and Equipment Maintenance</td>
<td>2055</td>
<td>1,885</td>
<td>100%</td>
</tr>
<tr>
<td>2721EA</td>
<td>Fire Systems Maintenance North</td>
<td>Tools and Equipment Maintenance</td>
<td>2056</td>
<td>7,534</td>
<td>100%</td>
</tr>
<tr>
<td>273E</td>
<td>Vehicle Maintenance Shop</td>
<td>Vehicle and Mobile Equipment Maintenance</td>
<td>2056</td>
<td>6,000</td>
<td>100%</td>
</tr>
<tr>
<td>274E</td>
<td>Painters Shop</td>
<td>Tools and Equipment Maintenance</td>
<td>2056</td>
<td>3,812</td>
<td>100%</td>
</tr>
<tr>
<td>MO722</td>
<td>Office Trailer - N of 274E</td>
<td>Construction and Fabrication Shop</td>
<td>2058</td>
<td>1,848</td>
<td>100%</td>
</tr>
<tr>
<td>4722C</td>
<td>Painters Shop</td>
<td>Tools and Equipment Maintenance</td>
<td>2031</td>
<td>4,080</td>
<td>100%</td>
</tr>
<tr>
<td>MO940</td>
<td>LMSI Maintenance Services</td>
<td>Tools and Equipment Maintenance</td>
<td>2050**</td>
<td>1,344</td>
<td>TBD</td>
</tr>
</tbody>
</table>

13 MSA GPF Shops = 80,292 square feet

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>Type</th>
<th>Estimated Disposition</th>
<th>Area (square feet)</th>
<th>% Utilized</th>
</tr>
</thead>
<tbody>
<tr>
<td>2703E</td>
<td>Maintenance Shop</td>
<td>Tools and Equipment Maintenance</td>
<td>2052</td>
<td>3,840</td>
<td>100%</td>
</tr>
<tr>
<td>2767E</td>
<td>Construction Carpenter Shop</td>
<td>Construction and Fabrication Shop</td>
<td>2045</td>
<td>1,600</td>
<td>100%</td>
</tr>
<tr>
<td>277A</td>
<td>Construction Fabrication Shop - West of 241AZ Tank Farm</td>
<td>Construction and Fabrication Shop</td>
<td>2045</td>
<td>3,200</td>
<td>100%</td>
</tr>
<tr>
<td>MO732</td>
<td>Carpenter Shop</td>
<td>Construction and Fabrication Shop</td>
<td>2048</td>
<td>1,848</td>
<td>90%</td>
</tr>
<tr>
<td>2715WA</td>
<td>Carpenter Shop</td>
<td>Construction and Fabrication Shop</td>
<td>2038</td>
<td>2,400</td>
<td>100%</td>
</tr>
</tbody>
</table>

5 WRPS GPF Shops = 12,888 square feet

25 Total GPF Shops = 146,298 square feet

Figure 5-2 compares the use of GPF shops by organization with the amount of area those facilities provide. Figure 5-2 shows the area provided by the shops by type. Figure 5-3 illustrates the number and area of the GPF shops in square feet.
Figure 5-1. Comparison of GPF Shops by Ownership.

<table>
<thead>
<tr>
<th>Ownership</th>
<th>Number of Shops</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSA</td>
<td>13</td>
<td>52%</td>
</tr>
<tr>
<td>CHPRC</td>
<td>7</td>
<td>28%</td>
</tr>
<tr>
<td>WRPS</td>
<td>5</td>
<td>20%</td>
</tr>
</tbody>
</table>

146,298 Square Feet of GPF Shop Space

<table>
<thead>
<tr>
<th>Ownership</th>
<th>Square Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSA</td>
<td>80,292</td>
</tr>
<tr>
<td>CHPRC</td>
<td>53,118</td>
</tr>
<tr>
<td>WRPS</td>
<td>12,888</td>
</tr>
</tbody>
</table>

Figure 5-2. GPF Shops by Type and Ownership.

<table>
<thead>
<tr>
<th>Type and Maintenance</th>
<th>Gross Square Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRPS</td>
<td>104,204</td>
</tr>
<tr>
<td>CHPRC</td>
<td>79,246</td>
</tr>
<tr>
<td>MSA</td>
<td>27,018</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type and Equipment Maintenance</th>
<th>Gross Square Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tools and Equipment Maintenance</td>
<td>104,204</td>
</tr>
<tr>
<td>Construction and Fabrication</td>
<td>79,246</td>
</tr>
<tr>
<td>Vehicle and Mobile Equipment Maintenance</td>
<td>27,018</td>
</tr>
</tbody>
</table>

5-3
General observations regarding Site GPF shop space includes the following.

- The 25 GPF shop facilities comprise 146,298 square feet, with an average of nearly 5,900 square feet per facility.
- Tool and equipment maintenance is the majority (71%) use of GPF shop space.
- The type of shop space used by each program depends directly on the scope of their respective contracts:
  - CHPRC’s predominant shop space supports tools and equipment associated with demolition activities and groundwater programs.
  - MSA’s predominant shop space supports tools and equipment maintenance (e.g., utility and electrical equipment). In addition, the GPF vehicle and mobile equipment maintenance shops are managed by MSA because of the responsibilities assigned to MSA through the MSC to maintain government-owned vehicles, trailers, and equipment.
  - WRPS’s predominant shop space supports construction and fabrication activities associated with tank farm cleanup activities.
- Most of the GPF shop space (96%) is located in the Central Plateau:
  - 91% (133,002 square feet) of the GPF shop space is in the 200 East Area.
  - 5% (7,872 square feet) of the GPF shop space is in the 200 West Area.
Figure 5-4 shows the area of the shops over time, and considers the estimated disposition years reported in FIMS and listed in Table 5-1. Figure 5-4 also considers a planned, new MSC shop in the 200 East Area.

![Figure 5-4. Supply of GPF Shops through 2050 by Ownership.](image)

Over 90% of the current shop space is planned to be retained through Site closure, although current plans for the GPF shop space are to start decreasing the number of GPF shops in 2032. The decrease in GPF shop space begins with the closure of the MSC 400 Area Painter’s Shop (Facility 4722C) in 2031, and the CHPRC tool crib (MO2162) in the 200 West Area in 2033. An additional three facilities are to be closed by 2045, thereby reducing the number of shops to 22 for a total of 152,514 square feet.

### 5.2 Demand of General Purpose Shop Facilities

Detailed estimates for future demand for GPF shop space have not yet been developed, with the exception of the demand for shops supporting fleet maintenance. Planning for shop space is challenging because the needs for shop space depend directly on the type of equipment needed to conduct operations. Details regarding the specific type of equipment that will be used in future operations are not often known well in advance. The following needs have been identified, based on known future requirements.

- Shop space is anticipated to continue to be required primarily in the 200 East Area, as that area will be the geographic hub of future planned cleanup activities.
• The need for a new 12,000 square-feet fleet facility in the 200 East Area has been identified by the MSC in the Fleet Services Facilities Master Plan Report (Reliability Project L-845). The facility is to provide sufficient floor space for light-equipment maintenance activities conducted under the MSC for fleet operations, including body shop and painting operations. After construction, MSA’s shop space in the 400 Area (Building 4722C, Painters Shop) will be vacated and consolidated to this new facility.

• Modifications are planned for Building 273E Vehicle Maintenance Shop, after Building 4722C is vacated, to provide additional shop space for auto body and painting operations. Located in the 200 East Area, Building 273E currently has four bays to support shop operations. Storage needs for related parts and equipment supplies is provided in four nearby Connex storage units. Two of the bays will be converted to support auto body and painting operations. Additionally, storage capacity will be increased by adding a nearby facility, as discussed in Section 6.2.

The specific needs for fleet maintenance space are currently being evaluated in a cost-benefit analysis and will soon be published in the Consolidated Fleet Services Complex Life-Cycle Cost/Benefit Analysis Report (HNF-61233). This document will include more detailed recommendations regarding modifications and new shop facilities (such as the identification of a second new shop that will be needed during the next 8 years).

In addition to these anticipated demands, existing facilities may also need to be replaced to maintain the inventory of available, required space through mission need. Figure 5-5 shows the reduced supply of GPF shop space when the end of facility lifecycle is considered, per the FLDM. The anticipated lifecycle has been exceeded for the following facilities.

• 274E, Sign Shop
• MO354, Office Trailer - at 2400E CPP Maint
• MO722, Office Trailer - N of 274E.

New Fleet Maintenance Shop
As described in the Fleet Services Facilities Master Plan Report (HNF-6164, Rev. 0) a new MSC fleet maintenance shop is planned for the 200 East Area to be available for use by 2024. Relocation of this capability from the 400 Area to the 200 East Area supports the migration of the primary mission activities to the Central Plateau and out of the 400 Area, replacing 4722C, Painters Shop, currently planned for disposition in 2031.
As shown in Figure 5-5, the potential supply of shop space continues to decrease over time (up to ~20,000 square feet loss of space) because facilities have exceeded their lifecycles. The continued decrease is due to the following GPF shop facilities that currently endure their anticipated lifecycle but for which their mission need will continue beyond their lifecycle.

- 2101M, Warehouse Shops and Office Building (which includes a shop portion)
- 2719EA, Electrical Shop - At 4th and Baltimore
- MO495, Office Trailer - E of 2754W
- MO732, Carpenter Shop
- MO743, Shop / Office Trailer - S of 272WA

Figure 5-5. Reduced Supply of GPF Shops When End of Facility Lifecycles are Considered.

Therefore, as planning is conducted in future years, the possibility of the need for new shop space to address aging facilities will also need to be considered. More detailed information regarding the facilities and their anticipated lifecycle is provided in Appendix E.

5.3 Conclusion

Potential gaps in the supply and demand for shop space is being addressed by some of the activities described in Section 5.2. However, regular evaluating and planning should be conducted for adequate shop space to address the issues identified (e.g., some shop facilities will exceed their facility lifecycles, and as additional project planning is conducted, future shop space requirements may be identified).
The planning should also consider that a number of GPF dedicated shop facilities may become available for use by other projects. As shown in Table 5-2, ~80,000 square feet of GPF space are dedicated shop facilities. These facilities may become available for use by other projects when the current projects to which these facilities are dedicated are completed.

The following recommendations are based on this analysis.

- To the extent possible, if additional shop space is added, it should be added to the 200 East Area, to continue the trend of consolidating shop space to the 200 East Area.

- Review the results of the Consolidated Fleet Services Complex Life-Cycle Cost/Benefit Analysis Report and incorporate into the Sitewide Facility Management Planning process. More detailed planning regarding additional needs for other types of shop space should be conducted at a Site level. This could be conducted with support from the JCSUB.

- Consider lessons learned from contractors that have shared space to develop future mechanisms that will support multiple contractors sharing space in the same shop facility.

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of Facilities</th>
<th>Area (square feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 Area</td>
<td>2</td>
<td>4,928</td>
</tr>
<tr>
<td>200 East Area</td>
<td>1</td>
<td>2,800</td>
</tr>
<tr>
<td>200 West Area</td>
<td>4</td>
<td>10,547</td>
</tr>
<tr>
<td>400 Area</td>
<td>1</td>
<td>8,000</td>
</tr>
<tr>
<td>600 Area</td>
<td>5</td>
<td>30,884</td>
</tr>
<tr>
<td>Richland</td>
<td>1</td>
<td>23,021</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14</strong></td>
<td><strong>80,180</strong></td>
</tr>
</tbody>
</table>
6. WAREHOUSE AND STORAGE - ANALYSIS

This section provides information regarding the supply of GPF warehouse and storage space; a general description of the anticipated demand for GPF warehouse and storage space; and general observations and recommendations regarding future planning. The data presented in this section were reviewed by facility management subject matter experts and incorporate information from a review of the infrastructure master plans, including the Infrastructure and Services Alignment Plan (HNF-44238, Revision 8).

6.1 Warehouse Space

A “warehouse” for purposes of this Plan is a Site facility that provides space for inventory that is controlled and managed through the Asset Suite purchasing and inventory control system. Multiple Site contractors use Asset Suite to procure materials and services. MSA uses the inventory control module of Asset Suite to enter, track and disburse items from the various inventories (General Supplies Inventory, spare parts and convenience storage inventories) held for Site contractors in MSA controlled warehouses.

6.1.1 Supply of General Purpose Warehouse Facilities

Four GPFs comprise a total of 217,525 square feet of warehouse space, and are listed in Table 6-1 by geographic area. Photographs of the four warehouses are shown in Figure 6-2.

Observations regarding the GPF warehouses include the following.

- MSA manages four warehouses which comprise nearly 10% of GPF space (217,525 of the 2,314,443 GPF square feet).
- 84% of the warehouse space is in the two largest warehouses: 2101M in the 200 East Area and 2345-2355 Stevens Drive within the City of Richland.
- Three of the four warehouses are DOE-owned, comprising 64% of the warehouse space; the single leased warehouse is 2345-2355 Stevens Drive.

Figure 6-1 shows the supply of warehouse space over time, based on the scheduled closure dates of the facilities. Table 6-1 lists the estimated disposition dates. Figure 6-1 also shows a decrease in supply after the two smaller warehouses (4732A and 4732C) are scheduled to close in 2031, and warehouse activities are consolidated to 2345-2355 Stevens Drive, and 2101M.
Table 6-1. List of MSC GPF Warehouses.

<table>
<thead>
<tr>
<th>Hanford Area</th>
<th>Facility ID</th>
<th>Name b</th>
<th>Ownership c</th>
<th>Estimated Disposition d</th>
<th>Area e (square feet)</th>
<th>% Utilized f</th>
</tr>
</thead>
<tbody>
<tr>
<td>200E</td>
<td>2101M</td>
<td>Warehouse Shops and Office Building - (Warehouse Portion) g</td>
<td>DOE Owned</td>
<td>2057</td>
<td>104,605</td>
<td>95%</td>
</tr>
<tr>
<td>400</td>
<td>4732A</td>
<td>Warehouse and Material Storage/Staging</td>
<td>DOE Owned</td>
<td>2031</td>
<td>15,000</td>
<td>95%</td>
</tr>
<tr>
<td>400</td>
<td>4732C</td>
<td>Warehouse</td>
<td>DOE Owned</td>
<td>2031</td>
<td>20,000</td>
<td>90%</td>
</tr>
<tr>
<td>Richland</td>
<td>2345-2355 STEVENS DR</td>
<td>MSA - 1162-1163 Warehouse</td>
<td>Contractor Leased</td>
<td>2050 h</td>
<td>77,920</td>
<td>85%</td>
</tr>
</tbody>
</table>

4 MSA GPF Warehouses = 217,525 square feet

---

a A unique FIMS facility identifier.
b The FIMS facility name, including acronyms or is spelled out for clarity and may not indicate predominant use.
c A category created for this Plan, based on facility activity type.
d The estimated fiscal year of completed facility disposition, per FIMS.
e FIMS calculates total floor area in two ways: 1) per ANSI/BOMA Z65.3-2009, Gross Area of a Building: Standard Methods of Measurement; and 2) as measured between exterior finished surfaces and multiplied by the number of facility levels. The facility portion reported in FIMS; percent utilized = ([asset utilized gross square feet / asset total gross square feet] x 100). The FIMS Data Element Dictionary (2016) states “for programmatic facilities” “…the Asset % Utilized may be considered to be 100% if the mission requires 100% of the facility, even” … “when the facility is not fully utilized, or even unutilized.”
g This Plan reports warehouse, shop, and office space, because of its large size and multiple uses. Only shop space is listed in this table.
h No estimated disposition year in FIMS; assumed to be available for the Site lifecycle.
** Leased GPF dedicated shop; assumed to be available for the Site lifecycle.
Figure 6-2. Photographs of the General Purpose Facility Warehouses.

2101M
Warehouse Shops and Office Building

2345-2355 Stevens Drive
MSA - 1162-1163 Warehouse

4732A
Warehouse and Material Storage/Staging

4732C
Warehouse
In 2011, an initiative began to consolidate warehouse and storage space. As described in *Site-Wide Material and Storage Consolidation Value Management Workshop II* (2012), the initiative was kicked off by a value management workshop held with MSA, CHPRC, WRPS, and Washington Closure Hanford in November and December 2011. Several recommendations to consolidate space were identified during the workshop. These included recommendations to disposition and/or relocate materials in two leased warehouses, allowing those facilities to be vacated, and also to adjust inventories to appropriate levels based on forecasted demand, including reviewing inactive inventory items and dispositioning any that were determined to no longer be needed at the Site. This would allow space to be freed to consolidate inventory to 2101M and eliminate the need for additional DOE-owned and/or leased storage facilities that were being used at the time. Since 2012, excess materials have been dispositioned from roughly 10,000 square feet in 2101M. A backlog of excess materials occupying an estimated 30,000 square feet remains, and once those materials are identified and dispositioned (as funding and Site priorities permit), additional warehouse space will be made available for inventoried materials.

### 6.1.2 Demand for General Purpose Warehouse Facilities

The demand for GPF warehouse space is anticipated to remain near current levels for the immediate future. The demand for warehouse space is not anticipated to decrease immediately, as Site cleanup continues, and the Site footprint is reduced. This is because the warehouses are used to receive, store and distribute materials used in ongoing cleanup and D&D activities, and to store and process excess materials from the cleanup activities, before their disposition. Excess materials are first made available to other Site project activities and then are considered for disposition off Site, if no longer needed.

Recognizing the ongoing need for warehouse space, the 2012 initiative to consolidate inventory is continuing to be implemented. By reviewing the existing inventory and dispositioning materials that have not been identified for future use, current warehouse space is anticipated to continue to be sufficient for ongoing activities.

When considering the Site planned projects through 2050, the following demand requirements are anticipated.

- An increase in demand for warehouse space is anticipated to support the construction and operations of the WTP. Coordination between RL and ORP will be required to provide sufficient space.
During the 2030s, as significant D&D activities are conducted in the 400 Area, an increased demand for warehouse space is likely to occur. Warehouse space requirements should be considered in the analyses supporting the planning and cost evaluation for 400 Area D&D activities.

Increased demand is also anticipated, at least initially as materials are excessed, during the other significant D&D activities planned throughout the Site (e.g., the canyon facilities, Building 324).

Demand is also anticipated to decrease as tank farm closure activities are conducted. As future plans for these areas are refined, warehouse space requirements should be considered in the analyses supporting the planning and cost evaluation for these activities.

6.1.3 Conclusions

In addition to the anticipated demands, replacing existing facilities is necessary to provide the required space through mission needs. Based on the FLDM, the anticipated life of 2101M is 75 years. Therefore, this 1953-constructed warehouse may need to be replaced in 2028. Figure 6-3 shows how the supply of warehouse space will be reduced if the lifecycle of 2101M ends in 2028, and it is not replaced.

Figure 6-3. Reduced Supply of GPF Warehouse Space When End of Facility Lifecycles are Considered.
As planning is conducted in future years, the possibility of the need for a new warehouse space should be considered. Based on the FLDM, the other DOE-owned GPF warehouse facilities (Buildings 4723A and 4723C) also are anticipated to have a life of 75 years. Building 4732A was constructed in 1978, and 4723C was constructed in 1982. However, based on current plans for dispositioning in 2031, these facilities will not need to be replaced beforehand.

It is also anticipated that to adequately support the planned mission for these facilities, the three DOE-owned GPF warehouse facilities will require replacement of their HVAC and roof systems. More detailed information regarding the facilities and their anticipated lifecycle is provided in Appendix E.

6.2 Storage Space

This section provides information regarding the supply of GPF storage space and a general description of the anticipated demand for GPF storage space, including recommendations regarding future planning.

6.2.1 Supply of General Purpose Storage Facilities

Fourteen GPF storage facilities comprise 76,604 square feet of space. Figure 6-4 shows the division of the number of those facilities and the total area of space by organization and type.

Figure 6-4. GPF Storage by Ownership.

Figure 6-5 summarizes information regarding GPF storage facilities locations by organization.
Observations regarding the GPF storage facilities include the following.

- WRPS has the greatest number GPF storage facilities (9 of 14) and comprises 70% (53,642 square feet) of the storage space.

- Nearly 70% of the GPF storage space is in the Central Plateau (51,762 of 76,604 square feet), and 96% of that space is managed by WRPS.

- All GPF storage facilities are DOE-owned, with an average of 5,472 square feet per facility.

- More than 50% of the GPF storage space is within the following four facilities.
  - 2101HV, Material Staging Facility, a WRPS facility in the 200 East Area – 15,000 square feet
  - 218A, Conditioned Storage Building, a WRPS facility in the 200 East Area – 10,000 square feet
  - 4734C, Storage Facility, an MSA facility in the 400 Area – 8,092 square feet
  - 4704N, MSA Furniture Storage, an MSA facility in the 300 Area – 8,070 square feet.
Table 6-2 lists GPF storage facilities and provides information on their locations, ownership, disposition, size, and utilization.

<table>
<thead>
<tr>
<th>Area</th>
<th>ID</th>
<th>Name</th>
<th>Ownership</th>
<th>Estimated Disposition</th>
<th>Area (square feet)</th>
<th>% Utilized</th>
</tr>
</thead>
<tbody>
<tr>
<td>200W</td>
<td>MO739</td>
<td>Storage Trailer - W of 2706T</td>
<td>DOE Owned</td>
<td>2042</td>
<td>520</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CHPRC GPF Storage Facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200W</td>
<td>2724WB</td>
<td>Storage Building</td>
<td>DOE Owned</td>
<td>2046</td>
<td>1,600</td>
<td>100%</td>
</tr>
<tr>
<td>400</td>
<td>4704N</td>
<td>MSA Furniture Storage</td>
<td>DOE Owned</td>
<td>2031</td>
<td>8,070</td>
<td>100%</td>
</tr>
<tr>
<td>400</td>
<td>4734C</td>
<td>Storage Facility</td>
<td>DOE Owned</td>
<td>2031</td>
<td>8,092</td>
<td>100%</td>
</tr>
<tr>
<td>600</td>
<td>6270</td>
<td>Environmental Data Remedial Tracking System</td>
<td>DOE Owned</td>
<td>2055</td>
<td>4,680</td>
<td>85%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Facility at WSCF (Storage &amp; Training)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 CHPRC GPF Storage Facility = 520 square feet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>4734C</td>
<td>Storage Facility</td>
<td>DOE Owned</td>
<td>2031</td>
<td>8,092</td>
<td>100%</td>
</tr>
<tr>
<td>600</td>
<td>611</td>
<td>Cold Test Facility Warehouse</td>
<td>DOE Owned</td>
<td>2050</td>
<td>4,000</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WRPS GPF Storage Facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200E</td>
<td>2101HV</td>
<td>Material Staging Facility</td>
<td>DOE Owned</td>
<td>2045</td>
<td>15,000</td>
<td>100%</td>
</tr>
<tr>
<td>200E</td>
<td>2106HV</td>
<td>HWVP Storage Building (Sprung Dome)</td>
<td>DOE Owned</td>
<td>2045</td>
<td>6,648</td>
<td>100%</td>
</tr>
<tr>
<td>200E</td>
<td>218A</td>
<td>Conditioned Storage Building</td>
<td>DOE Owned</td>
<td>2050 **</td>
<td>10,000</td>
<td>100%</td>
</tr>
<tr>
<td>200E</td>
<td>2715AW</td>
<td>Tank Farm Storage / Staging Facility</td>
<td>DOE Owned</td>
<td>2044</td>
<td>2,400</td>
<td>100%</td>
</tr>
<tr>
<td>200E</td>
<td>TC272HV</td>
<td>Storage Building - At HWVP</td>
<td>DOE Owned</td>
<td>2046</td>
<td>810</td>
<td>100%</td>
</tr>
<tr>
<td>200W</td>
<td>2275S</td>
<td>Lab Conditioned Storage Building</td>
<td>DOE Owned</td>
<td>2054</td>
<td>6,000</td>
<td>100%</td>
</tr>
<tr>
<td>200W</td>
<td>2713WB</td>
<td>Tank Farm Project Ops</td>
<td>DOE Owned</td>
<td>2050 **</td>
<td>6,384</td>
<td>50%</td>
</tr>
<tr>
<td>200W</td>
<td>2727WA</td>
<td>Storage Facility</td>
<td>DOE Owned</td>
<td>2050 **</td>
<td>2,400</td>
<td>100%</td>
</tr>
<tr>
<td>600</td>
<td>311</td>
<td>Cold Test Facility Warehouse</td>
<td>DOE Owned</td>
<td>2050 **</td>
<td>4,000</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9 WRPS GPF Storage Facilities = 53,642 square feet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **A unique FIMS facility identifier.**
- **The FIMS facility name, including acronyms or is spelled out for clarity and may not indicate predominant use.**
- **A category created for this Plan, based on facility activity type.**
- **The estimated fiscal year of completed facility disposition, per FIMS.**
- **FIMS calculates total floor area in two ways: 1) per ANSI/BOMA Z65.3-2009, Gross Area of a Building: Standard Methods of Measurement; and 2) as measured between exterior finished surfaces and multiplied by the number of facility levels.**
- **That facility portion reported in FIMS; percent utilized = ([asset utilized gross square feet / asset total gross square feet] x 100). The FIMS Data Element Dictionary (2016) states “for programmatic facilities” … “the Asset % Utilized may be considered to be 100% if the mission requires 100% of the facility, even” … “when the facility is not fully utilized, or even unutilized.”
- **This Plan reports warehouse, shop, and office space because of its large size and multiple uses. This table lists only storage space.**
- **No estimated disposition year in FIMS; assumed to be available for the Site lifecycle.**
- **Leased GPF dedicated shop; assumed to be available for the Site lifecycle.**

Figure 6-6 shows information about the supply of storage space over time. Figure 6-6 also shows that the first planned decrease in storage space is anticipated to occur in 2031, when the MSC plans to close its two storage facilities in the 400 Area. The PRC’s single GPF storage
facility is planned to be closed in 2042. The TOC’s storage facilities are planned to be closed on a rolling basis, starting in 2044.

Figure 6-6. Estimated Projected Supply of GPF Storage.

The consolidation activities begun in 2012, include more efficient use of storage and warehouse space, allowing leases for several facilities to be terminated and the overall number of storage facilities to be reduced. Also, the corrective actions being implemented as a result of an audit of personal property managed in warehouse and storage facilities will help to further consolidate materials and help to provide adequate storage space.

6.2.2 Demand for General Purpose Storage Facilities

The demand for GPF storage space to support cleanup depends primarily on the following.

- The types of equipment, parts and other items that will need to be stored
- The number of items requiring storage
- The requirements for proximity to the project(s) being supported.

Future requirements for storage space are difficult to estimate accurately, particularly for projects still in the planning phase. However, known anticipated demands include the following.

- WRPS anticipates additional space required for storing spare equipment and parts, storing work packages, and serving as a tool crib to support ORP’s Low Activity Waste Pretreatment System.
• WRPS is reviewing its existing storage at this time. Future storage space needs will be estimated as a result of this review.

• CHPRC will need to replace the 5,000 square feet of storage space currently used in the GPF dedicated storage facility, Energy Northwest Building 127. However, it is anticipated that this need will be able to be addressed by existing onsite facilities.

In addition to the known demands, existing facilities may need to be replaced to meet the demand for required space mission needs. Figure 6-7 shows how the supply of storage space may be reduced if the facilities are not replaced. The data used to prepare Figure 6-7 are based on the anticipated lifecycles identified in the FLDM.

Figure 6-7. Reduced Supply of GPF Storage Space When End of Facility Lifecycles are Considered.

The storage facilities for which their mission will exceed their anticipated lifecycle, thus reducing the supply as shown in Figure 6-7, include the following.

• The WRPS facility 2713WB, Tank Farm Project Ops, a 6,384-square-feet facility in the 200 West Area, constructed in 1944, is planned to be used beyond its 75-year design life.

• The CHPRC facility MO739, Storage Trailer - W of 2706T, a 520-square-feet facility in the 200 West Area, installed in 1972, will be used beyond its 30-year design life.

• The WRPS 2727WA, Storage Facility, a 2,400-square-feet facility in the 200 West Area, constructed in 1968, is planned to be used a few years beyond its 75-year design life.
If these facilities are not replaced, the ability to provide adequate storage space to support the cleanup mission is at risk. It is also anticipated that to adequately support the planned mission for these facilities, most of the GPF storage facilities will require HVAC and roof system replacement.

6.2.3 Conclusions

Potential gaps in the supply and demand for storage space is being addressed by some of the activities described in Section 6.2.2. However, it will be important to continue regular evaluating and planning for adequate storage space to address the issues identified (e.g., some storage facilities will exceed their facility lifecycle, and as additional project planning is conducted, future storage space requirements may be identified).

The planning should also consider that several GPF dedicated storage facilities may become available for use by other projects. As shown in Table 6-2, ~928,000 square feet of GPFs are dedicated storage facilities. These facilities may become available for use by other projects when the current projects to which these facilities are dedicated are completed.

<table>
<thead>
<tr>
<th>Table 6-2. GPF Dedicated Storage.</th>
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<tbody>
<tr>
<td><strong>Location</strong></td>
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<tr>
<td>100 Area</td>
</tr>
<tr>
<td>200 East Area</td>
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<tr>
<td>200 West Area</td>
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<td>300 Area</td>
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<td>400 Area</td>
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<tr>
<td>600 Area</td>
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<td>Richland</td>
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<td><strong>Total</strong></td>
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7. FACILITY LIFECYCLE DATA MODEL ANALYTICAL RESULTS

This section presents the analytical results of the FLDM that need to be considered in GPF planning activities. This information from FLDM is being provided to the individual facility management organizations for their review and consideration. Upgrading and/or replacing facilities is the decision of the individual programs.

7.1 Structures

Figure 7-1 shows the cumulative estimated costs for replacing DOE-owned GPFs that will reach their anticipated end of life before completion of their mission activities. These estimates are based on the data available in FLDM. Figure 7-1 also shows the cumulative area represented by these facilities.

Figure 7-1. Cumulative Estimated DOE-Owned GPF Area that May Need Replacement Before End of Mission and Associated Cost.

Without significant investment in these facilities, it will be more difficult to address the shortfall identified in this Plan. Based on the FLDM, the cumulative estimated costs to replace these facilities through 2050, is nearly $90 million. This estimate does not include the construction or leasing of any new facilities. Rather, it addresses only the replacement costs of existing
facilities. It is observed that no current capital projects or capital funding allocation requests are in place or anticipated for replacing any existing facilities or to construct new facilities. Therefore, it will be difficult to adequately address future shortfalls of space. If funding from operations projects are used to address shortfalls, less funding will be available for completing the cleanup mission.

A complete list of the DOE-owned GPFs and their anticipated lifecycles and estimated replacement costs is provided in Appendix E. Information regarding these facilities is being provided to the individual facility management organizations for their review and consideration. Also, training will be offered to the facility management organizations regarding the data inputs, uses, and benefits of the FLDM to help support informed decision making.

7.2 Subsystems: HVAC and Roof Systems

Significant facility subsystem upgrades and replacements are needed for the major building components - HVACs and roof systems - to sustain mission-driven facility operations throughout the Site’s cleanup mission.

7.2.1 HVAC Systems

Figure 7-2 shows the cumulative number of facilities, with HVAC systems in DOE-owned GPFs that will need to be replaced through the year 2030. Figure 7-2 also illustrates cumulative estimate cost of ~$22 million to replace those systems during that period. These costs will continue to increase over time as additional cycles of HVAC system replacements will be needed.

- HVAC systems in 123 GPFs have exceeded their estimated remaining lifecycle.
- HVAC systems in 107 other GPFs will exceed their estimated lifecycle in the next 10 years.
- Replacing HVAC systems over the next 13 years (as they exceed their lifecycle) will cost more than $22 million.
Older HVAC systems have higher failure rates and are no longer supported by their manufacturers. Often, replacement parts are very costly and hard to find, if at all. Significant resources are needed to address these repeated failing systems. Figure 7-2 shows that 123 DOE-owned GPFs have already exceeded their anticipated lifecycles. Within the next 10 years, an additional 107 facilities may also require HVAC system replacement and/or repair, as those systems exceed their lifecycles.

A complete list of the DOE-owned GPFs and their anticipated HVAC replacement dates and estimated replacement costs is provided in Appendix E. Information regarding these facilities is being provided to the individual facility management organizations for their review and consideration.
7.2.2 Roof Systems

The cumulative estimated costs, based on the FLDM, to replace the roofs for the facilities shown in Figure 7-3 is just over $7 million. These costs will continue to increase over time as additional cycles of roof system replacements will be needed. A complete list of the DOE-owned GPFs and their anticipated roof replacement dates and estimated replacement costs is provided in Appendix E.

Figure 7-3. Cumulative Estimated GPF Roof System that May Need Replacement Before End of Mission and Associated Cost.

It will be important to obtain the amount of funding adequate to upgrade and/or replace these roof systems and avoid off-normal leakage situations. Roof systems that are not successfully maintained are subject to repeated leaks, which can interrupt operations, create potential mold risks and other related safety situations, and damage interior facility contents. Figure 7-3 shows that 81 DOE-owned GPFs have roof systems that have exceeded their anticipated lifecycle. Within the next 10 years, an additional 49 facilities may also require roof system replacement and/or repair. A complete list of the DOE-owned GPFs and their anticipated roof replacement dates and estimated replacement costs is provided in Appendix E.
7.3 Conclusions

The analytical results of the FLDM indicate that a significant cost will be required to maintain and/or replace the needed GPFs and their associated subsystems. A key priority will be to review these lifecycle analytical results to determine in which facilities investments should be made. It will be important to obtain an adequate amount of funding for maintenance and replacement activities.

However, to prioritize facilities in which to invest, it will be important to consider these GPFs in the context of future plans. For example, if additional facilities are planned to be constructed and/or leased, then it may be possible to vacate some of the existing GPFs and relocate to the newer facilities. Also, as GPF dedicated facilities become available after their respective projects are completed, they may help to address gaps and reduce the estimated maintenance/replacement costs.
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8. RECOMMENDATIONS

This section summarizes the Plan’s conclusions and makes recommendations, based on this Plan’s analyses, to help provide adequate GPF space to support the Hanford cleanup mission through 2050. The conclusions are discussed in the three following subsections along with nine specific recommendations. The nine recommendations address the forecasted facility challenges (estimated shortfall in office space), a more robust planning process, and an increased use of the available planning tools.

The rationale for each recommendation is discussed as follows.

8.1 Address the Projected Office Space Shortfall

Of the three types of GPF facilities, office facilities present the greatest challenge to maintain an adequate supply. This is because: 1) office facilities represent over 80% of the total GPF space; 2) changes in the demand for office space generally are more dynamic from year-to-year than are changes in the demand for shop and warehouse and storage space; and 3) the projected shortfall of office space is significant, as illustrated in Figure 8-1.
The supply versus demand analysis of office space shows a significant gap of ~200,000 to 300,000 square feet in the supply of future office space for several years, with gaps greater than 50,000 square feet in additional years. Immediate attention must be given to this situation to avoid possible impacts to the cleanup mission.

No capital line item projects were identified in a review of budget submittals that would address the need for new office space. Several new facilities in the near term will provide a small increment of added space. These new facilities include acquiring a small amount of lease space in the City of Richland and the addition of a 10-wide trailers to support the TOC on the Central Plateau. However, this added space will not be enough to address the anticipated shortfall.

The analysis also demonstrates the options for optimizing GPF office space are currently limited. With the average GPF office space utilization at currently 89% and rapidly approaching the maximum utilization rate of 90% (agreed to by Hanford’s JCSUB), all three contractors are making the most efficient use of their assigned facilities. However, with office utilization rates...
so high, there is little room to effectively manage staff movement, and requires contractors to take additional, costly, time-consuming steps to relocate staff in or out of their facilities.

**Recommendation #1:** Initiate a project(s)/study(ies) to define future office space needs.

The analytical results show a significant gap of ~200,000 to 300,000 square feet in the supply of future office space in the near term and gaps greater than 50,000 square feet in additional years, primarily driven by the needs on the Central Plateau (PRC and TOC). However, the analyses presented in this Plan cannot define the type of office space, the exact size, the specific location(s), or the number of facilities needed to meet the demand. In addition, no projects are currently identified in any formal DOE capital budget submittal to address the need for additional office space. Therefore, the next step should be to conduct a supply and demand analysis at a geographic level to identify and optimize new facility locations. This analysis would need to be conducted in collaboration with the projects that will need the additional space, which likely will include RL and ORP.

A cost-benefit analysis to support this effort would identify whether one or multiple facilities would best meet this need, once the amount of space that is needed is determined on a geographic basis. Further, the location of any Central Plateau office facility would have to be carefully evaluated in light of the issues identified in the recent *National Institute for Occupational Safety and Health Report on Hanford Tank Farm Worker Safety*.

**Recommendation #2:** Continue to revisit supply and demand analyses to support long-range GPF planning.

Continue to revisit these supply and demand analyses as part of the long-range planning for GPFs on a regularly scheduled basis to increasingly refine the planning cost profiles as future plans are further developed in more detail. In particular, this will enable the demand of GPF office space to be more accurately estimated and new projects to address the office space be initiated in a timely manner. The analysis can be shared with the programs driving the need for new facilities and support line item projects that may be developed as a result.

### 8.2 Enhance the GPF Planning Process

GPFs are managed by their respective contractors. However, a single contractor is responsible for establishing the management process. Currently, MSA is that single contractor assigned
responsibility for managing the Sitewide Facility Management Process, with all three prime contractors also participating in the Sitewide Process in various ways.

The Sitewide Facility Management Process involves establishing a structured facility information process, creating a number of facility information systems, sharing the data with all contractors, and chairing the JCSUB. The JCSUB is comprised of members from each of the prime contractors and DOE, is managed by MSA, and used to address the Sitewide utilization of the GPFs. Facility management tools, developed by MSA, provide up-to-date facility information, help reinforce collaboration among the contractors, and strengthen the planning process. However, during the development of this Plan, it became evident that more long-range, collaborative, Sitewide planning would be helpful to prevent future shortfalls of GPF office space. Discussions with the major cleanup projects indicated that the focus of most planning efforts is on the technical issues related to the projects and that the potential projected need for office space is generally not considered. As a result, many projects simply rely on adding trailers to address longer-range space needs because trailers can be acquired and positioned in a relatively short time and without capital line item funding.

**Recommendation #3:** Actively manage and maintain GPF and GPF dedicated facilities lists.

Actively maintaining the lists of GPF and GPF dedicated facilities will help increase the visibility of the facilities and provide contractors with more up-to-date and timely information, which will help improve Sitewide efficiency in managing and using GPFs and improving information accuracy and availability. The steps to initiate this recommendation include the following.

a. Increase the frequency of tracking GPF from every 5 years (aligned to GPF Master Plan updates to annual generation).

b. Build an annual update of the GPF list into JCSUB or the MSC responsibilities.

c. Authorize the JCSUB to manage the GPF and GPF dedicated list.

d. Assign responsibility to the MSC to oversee the management of the list with input from the other Site contractors for their respective GPFs.
The Sitewide Facility Management Process flow discussed in Section 3.1 describes:
1) how facility management is to be conducted; 2) how facility information systems are used to
capture and share key information; and 3) how the Joint Contractor Site Utilization Board
(JCSUB) oversees the facility management activities (Section 3.1). Promotion of the Sitewide
Facility Management Process is recommended, so it is actively used in all aspects of facility
planning and strengthens the role of the JCSUB. The role of the JCSUB should be expanded to
take on a more long-range planning for GPFs, thus helping to identify potential, significant
shortfalls early enough to allow the planning that will be needed to address the shortfall in a
timely manner. Better information will lead to better informed decision making.

**Recommendation #4:** Promote the Sitewide Facility Management Process.

Develop a communication plan that includes the process, procedures, and training to share
information about facility management tools. This could include an MSA Streamline article
and improving access to the GPF-related process and tools maintained on the MSA Real Estate
Services webpage. Provide targeted training for using GPF information tracking tools.
Training currently is provided on the use of CareTaker and the Stewardship Information Portal.
This training could be expanded to include the full suite of facility management tools. This
training could continue to be expanded to include the full suite of facility management tools.
This will help to contractors who manage facility programs to have real-time access to facility
information to help make more informed decisions to increase the efficient use of GPFs.

**Recommendation #5:** Develop a communication plan that shares facility
management tools information.

Promote to facility managers across the programs that HFAL is the starting place for researching
available GPF space, as needs arise. Increasing the visibility and use of HFAL will help to
centralize the information regarding available space, improve real-time communication across
the programs, and support more efficient use of the GPFs.

**Recommendation #6:** Promote the HFAL as the starting place for researching
available GPF space.
Incorporate a regular review of the GPF dedicated facilities list to identify when facilities may become available for use by other projects. Also, some facilities have an anticipated lifecycle that exceeds the planned disposition year. These facilities could be considered for continued use beyond their planned disposition year and will be given adequate consideration when making decisions on space needs (utilization and adding new space). Taking advantage of these lists will help to minimize over-capacity and increase the efficient use of the GPFs.

8.3 Use the Facility Planning Tools to Identify Facility, HVAC System, and Roof System Replacements

The projected office space shortfall will increase, if existing GPFs are not maintained and replaced, as needed. Many GPFs remain in poor condition and will require significant investment for continued use. Several GPFs are among the oldest Site facilities and will require significant structural, HVAC system, and roof system maintenance to support cleanup operations for the remaining duration of the mission life. Without substantial investment in replacing facilities, HVAC systems, and roof systems, many will fail before mission completion, further constraining resources to address the office space shortfalls identified in this Plan.

Support the use of the FLDM lifecycle degradation curves to support lifecycle planning decisions for GPFs. The FLDM can also be expanded for use to support other Site facilities (non-GPF). The information in the FLDM can be used to help prioritize maintenance and replacement activities by considering the remaining years required to support mission need and where the facility is in the lifecycle degradation curve, in addition to the current condition of a facility. For example, the 2101M Warehouse Shops and Office Building (total of 157,841 square feet) is planned for use through 2057. The anticipated 2101M Building life is 75 years, based on the FLDM. Constructed in 1953, the 2101M Building is anticipated the facility may need to be replaced in 2028. Therefore, as planning is conducted in future years, the possibility of the need for a new warehouse space will need to be considered.
Incorporate the data and results from the FLDM to develop replacement projects for the highest priority buildings. The FLDM will be available to all contractors to assist them analyzing their facility integrity compared to mission life requirements. Upon facility selection, the FLDM displays the facility structure and HVAC and roof systems integrity in comparison of the facility current mission assignment. Reports can be generated that identify critical structure and HVAC and roof system replacement projects and can provide contractors with their outyear facility capital investment requirements.

**Recommendation #9:** Use FLDM data and analysis results to prioritize GPF replacement projects.

8.4 **Summary**

Building on the facility management process improvements from the 2012 plan, the recommendations in this Plan will help to address the longstanding and emerging issues regarding GPFs that affect efficient Site operations. The recommendations will address the forecasted facility challenges, the need for continuing to improve and enhance the planning process, and the need to increase the use and availability of the facility management planning tools. Recognizing one of the most urgent issues identified in this Plan is the anticipated shortfall of office space in the near term, it will be particularly important to immediately initiate the more detailed analyses necessary to support providing adequate office space for the cleanup mission. Implementing the recommendations identified in this Plan will help to promote efficient operations and project, and lead to reduced costs and reduced deficiencies, while supporting completing the cleanup mission.
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9. REFERENCES


FIMS Data Element Dictionary (November 8, 2016).


*Site Wide Material and Storage Consolidation Value Management Workshop II* (2012),